

Women and Minor Forms of Property Crime

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April, 2004**

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Acknowledgements

I would like to thank my faculty advisors, Dr. David Martin and Dr. Kelly Chaston

Abstract

In this paper, I examine aspects of economic marginalization and economic opportunity that may lead to increased rates of minor property crime (larceny, fraud, forgery, and embezzlement) committed by women. I conduct cross-sectional analysis in order to control for the role that changing social norms and values play in the decision to commit crime. The results indicate that, while controlling for a variety of factors such as urban/rural area and age, a number of variables influence women's minor property crime rate, such as public assistance income, the share of households headed by single mothers, and married women's labor force participation rate. Furthermore, I replicate such tests for rates of minor property crime committed by men and find that economic marginalization appears to apply more strongly to women and affects women's crime rates more than men's crime rates.

1. Introduction and Review of Previous Literature

Women's crime rates have increased significantly in the United States over the past half-century. In 1963, women accounted for 11.4% of individuals arrested in the United States. By 1998, that share had risen to 21.8%, with an even larger rise in the absolute number of crimes committed by women. Furthermore, the share of total offenders that are women varies widely by crime category as women commit a relatively large share of minor property crime (larceny, fraud, forgery, and embezzlement) relative to other forms of crime. For instance, in 1964 women accounted for 14.5% of persons arrested for minor property crime and this share rose to 38.3% by 1998. In comparison, in 1968 women accounted for 13.9% of all Type I arrests (criminal homicide, robbery, aggravated assault, burglary, larceny, and auto theft) and this share rose to only 26.0% in 1998.¹

In this paper, I examine rates of minor property crime committed by women because such rates make up a significant share of overall women's crime rates. At the root of this paper stand three early theoretical articles, one by Gary Becker and two by Isaac Ehrlich, that model crime as a basic supply function and form the basis of rudimentary economic analyses of crime.² Becker and Ehrlich discuss how the probability of conviction and severity of punishment both have an inverse relationship with the supply of crime by changing the expected cost of participation in criminal activity. Additionally, by changing the expected benefit of participation in criminal activity, income available from illegal activities has a direct relationship with the supply of crime

¹ Small (2000).

² Becker (1968), Ehrlich (1973), and Ehrlich (1996).

while increased income available through legal activities has a negative relationship with the supply of crime.

Further studies apply such a supply function to a gender framework. For example, Ann P. Bartel reveals that the sexes respond differently to disincentives to crime, specifically probability of arrest/conviction and severity of punishment, and responses to these disincentives affect rates of each type of minor property crime differently. In particular, rates of burglary and robbery by women appear closely tied to such deterrent measures, while larceny does not.³ However, Harold G. Grasmick, Nancy J. Finley, and Deborah L. Glaser utilize a survey of 360 adults in Oklahoma City to conclude that sex-role attitudes have little influence on differing property crime rates across the sexes.⁴

Four theories arise most often to explain the disproportionate rise in measured rates of minor property crime committed by women. First, sociological literature widely discusses how constructions of masculinity may lend themselves to criminal behavior while femininity typically contradicts criminal characteristics. This ‘masculinization theory’ holds that increasing gender equality (especially in the labor force) has led to women’s masculinization and, along with it, a taste and aptitude for crime.⁵

A second theory, which Kevonne Small labels ‘chivalry theory,’ holds that police officers and police agencies have decreased their leniency toward women over the past few decades.⁶ Therefore, women’s arrest rates have increased faster than women’s actual crime rates.

³ Bartel (1979).

⁴ Grasmick, Finley, and Glaser (1984).

⁵ See especially Steffensmeier and Allan (1996).

⁶ Small (2000).

A third theory posits that economic marginalization leads to increased rates of women's crime. This 'marginalization theory' asserts that gender norms, discrimination, and power relations in American society subordinate women and inordinately place them under economic stress (especially as marriage – and the corresponding reliance on a different method of support – becomes less central in society), thereby making illegal activities relatively more attractive. Furthermore, economically marginalized individuals have less access to forms of human capital, such as education and work experience, and thus have lower future expected income. Therefore, marginalization theory holds that women's crime rates should be relatively high for minor forms of property crime, which require little skill or access to criminal networks.⁷

A fourth theory also cites the influence that women's labor force activity has on women's crime rates. This 'opportunity theory' holds that the work environment creates opportunities for more crime, especially white-collar crime such as fraud and embezzlement, by reducing barriers to access for crime. Furthermore, increased financial independence and activity, resulting from women's expanded roles as heads of household, has also expanded women's opportunity to commit petty crimes such as credit card fraud.⁸

Ultimately, I seek to build upon the arguments put forward in support of marginalization theory while also considering aspects of opportunity theory that may influence rates of women's minor property crime. However, this analysis differs from past studies by evaluating cross-sectional data rather than time-series or panel data, thereby ignoring the role changing norms over time and instead solely focusing on the economic incentive structure associated with crime.

⁷ Small (2000), Steffensmeier and Allan (1996), Allen (1996), Simon and Landis (1991), Grasmick, Finley, and Glaser (1984), and Steffensmeier (1980).

⁸ Small (2000) and Steffensmeier and Allan (1996).

2. Development of Testable Hypotheses

Throughout this paper, the theoretical dependent variable is the rate of minor property crime committed by women. However, as I discuss in Section 3, data concerning women's minor property crime rates at the county level remain elusive, so the actual empirical analyses are performed with arrest data as the dependent variable (denoted WCrime). The first six independent variables discussed primarily concern marginalization theory, the next three incorporate both marginalization theory and opportunity theory, the following one primarily addresses opportunity theory, and the final six act as controls in the supply of crime model.

Women's Median Income (WIncome) and Percentage of Households that Receive Public Assistance Income (Assistance)

As income increases, *ceteris paribus*, the opportunity cost of arrest/conviction increases. Therefore, I expect a negative marginal relationship and elasticity between the rate of minor property crime committed by women and components of income. However, the pressure to commit crime may change very little as income increases once an individual has high income and is no longer economically marginalized. Therefore, at some point, increased income should exert a diminishing marginal influence on women's crime rates.

Percentage of Households Headed by Single Mothers (WHousehold), Percentage of Single Mother Households that are in Poverty (WPoverty), Teenage Pregnancy Rate (Pregnancies), and Percent of Population that is Black (Black)

The percentage of total households that are headed solely by single mothers serves as a proxy for the degree of women's economic responsibility. *Ceteris paribus*, a single mother needs a higher subsistence income than does a single woman with no children or a woman with an employed spouse, and an increased need for higher subsistence income increases the incentives to commit crime. Poverty, which disproportionately affects single mother households, and teenage pregnancies, which place a strain on a community's economic resources, both further such economic marginalization.⁹ Additionally, empirical studies have shown that the effects of discrimination and marginalization rest particularly acutely on black individuals (in addition to women).¹⁰ However, at high levels of these variables, increases in the variables may not serve to substantially increase crime rates if marginalization is already severe.

Women's Unemployment Rate (WUnemployment) and Women's Labor Force Participation Rate (WLabor)

While these two measures of labor force activity are closely related, I include them both to differentiate between the composition of the actual workforce and the nature of the overall group of women seeking employment. Opportunity theory suggests that the workplace provides

⁹ According to the U.S. Census Bureau (2003a and 2001), 6.8% of married couple households with children, 20.5% of single father households, and 39.9% of single mother households have income below the poverty level in 2000. Therefore, I maintain that a measure of poverty appropriately addresses the gender disparity in economic marginalization (see Albelda (1999), Fox (1997), Ehrlich (1996), and Rodgers (1996)).

¹⁰ Ihlanfeldt (2002) and Ralston (1999).

an arena for the commission of minor property crime, so greater unemployment should decrease such crime while greater labor force participation should increase such crime. However, as marginalization theory is my primary interest, I focus on the point that the opportunity cost of turning to illegal pursuits would, *ceteris paribus*, be lower for an unemployed woman than for an employed woman. Furthermore, at some point, I expect an increase in the unemployment rate and a decrease in the labor force participation rate to have a diminishing marginal influence on women's crime rates because those individuals with greater criminal aptitude/tendencies will have already entered into illegal activity.

Pink-Collar Occupations (Occupations)

This variable measures the percentage of total jobs that are in the clerical, sales, and office occupations – occupations that comprise a significant degree of the so-called ‘pink collar’ professions. Such pink-collar jobs are filled predominately by women and offer generally lower incomes than other occupations. Therefore, pink-collar workers may experience a higher degree of alienation and marginalization and, thus, may have a lower opportunity cost of crime than do workers in other occupations.¹¹ Additionally, the working environment for these occupations offers an arena for the commission of minor property crime, such as minor embezzlement or the defrauding of customers by a bank teller. However, I cannot predict the sign of the second derivative.

¹¹ See Radosh (1990) for a more complete discussion of this neo-Marxist argument.

Married Women's Labor Force Participation (MarriedLabor)

The labor force provides an arena for married women to commit minor property crime and, by leaving for work they physically abandon their home for the day, women (and men) may open up opportunities for larceny at their home. Therefore, increases in this variable should correspond to higher rates of women's minor property crime. However, I expect labor force activity among married women to have a diminishing marginal influence on women's crime rates.

Percentage of Women that are Enrolled in Higher Education (WEducation), Percentage of Women Ages 18-34 (WAge), Median Household Income (Income), Per-Capita Police Officers (Police), and Dummy for Metropolitan Area (DummyMetropolitan)

These five variables control for factors not directly related to marginalization theory or opportunity theory. 1) Time in higher education has been shown to significantly reduce time available for other activities, thereby leading to lower crime rates.¹² 2) Past studies have also indicated that individuals between the age of eighteen and thirty-four have a particularly high proclivity to commit crime.¹³ 3) A community with higher median household income should, *ceteris paribus*, have more worthwhile targets for minor property crime. 4) Increased numbers of police officers should act as a deterrent to potential criminals, thus leading to lower crime rates, and I treat this variable as a general proxy for other measures of the probability of arrest/conviction and police spending. 5) Past analyses show property crime to be directly related to the degree of urbanization due to the anonymity provided by larger cities, so I expect

¹² Ehrlich (1973).

¹³ Leung (1994) and chapter seven of Borjas (1999).

the coefficient of the dummy for metropolitan area, which takes a value of one for metropolitan areas and zero otherwise, to be positive.¹⁴

Dummy for State (DummyState)

As I discuss in Section 3, each observation for this study represents a county in Michigan or in Pennsylvania. However, a discussion of different crime rates between Michigan and Pennsylvania is beyond the scope of this paper, so I can make no conjecture concerning the sign or magnitude of the calculated coefficient for DummyState, which takes a value of one for the state of Michigan and zero for Pennsylvania.

Table 1 summarizes my expectations for each of the independent variables:

Table 1
Expectations for the Independent Variables

<i>Independent Variable</i>	<i>Sign of Expected First Derivative</i>	<i>Sign of Expected Second Derivative</i>	<i>Sign of Expected Elasticity</i>
Women's Median Income	-	+	-
Single Mother Households	+	-	+
Single Mother Households in Poverty	+	-	+
Teenage Pregnancies	+	-	+
Percent Black	+	None	+
Public Assistance Income	-	+	-
Women's Unemployment	+	-	+
Women's Labor Force Participation	-	+	-
Pink-Collar Occupations	+	None	+
Married Women's Labor Force Participation	+	-	+
Women Enrolled in Higher Education	-	+	-
Women's Age	+	-	+
Median Household Income	+	-	+
Per-Capita Police Officers	+	-	+
Dummy for Metropolitan Area	None	None	+
Dummy for State (Michigan=1)	None	None	None

¹⁴ Hakim, Spiegel, Weinblatt (1984).

The Model

The above discussion of the variables leads to the functional relationship for the i^{th} observation in Equation 1:

$$(1) \quad WCrime_i = f(WIncome_i, WHousehold_i, WPoverty_i, Pregnancies_i, Black_i, Assistance_i, \\ WUnemployment_i, WLabor_i, Occupations_i, MarriedLabor_i, WEducation_i, \\ Wage_i, Income_i, Police_i, DummyMetropolitan_i, DummyState_i)$$

The log-linear functional form is the most widely used functional form in economic analyses of crime, so using such a form enables me to directly compare my results with much of the general body of literature.¹⁵ Furthermore, the log-linear form allows for discussion of the estimated coefficients as percentage changes (elasticities), thereby facilitating comparisons between two regressions (as I discuss below). However, I must emphasize that a number of functional forms could also prove appropriate since I cannot predict whether the elasticities should be constant or non-constant. Therefore, I choose to utilize the log-linear form due to its compatibility with prior research but at the cost of requiring constant elasticities.

I estimate the model of women's minor property crime rates in Equation 2:

$$(2) \quad \ln(WCrime_i) = \beta_0 + \beta_1 \ln(WIncome_i) + \beta_2 \ln(WHousehold_i) + \beta_3 \ln(WPoverty_i) + \\ \beta_4 \ln(Pregnancies_i) + \beta_5 \ln(Black_i) + \beta_6 \ln(Assistance_i) + \\ \beta_7 \ln(WUnemployment_i) + \beta_8 \ln(WLabor_i) + \beta_9 \ln(Occupations_i) + \\ \beta_{10} \ln(MarriedLabor_i) + \beta_{11} \ln(WEducation_i) + \beta_{12} \ln(WAge_i) + \\ \beta_{13} \ln(Income_i) + \beta_{14} \ln(Police_i) + \beta_{15} DummyMetropolitan_i + \\ \beta_{16} DummyState_i + \mu_i$$

¹⁵ For example, see Ehrlich (1973), Levitt (1995), and Witt and Witte (1998).

The slope coefficients β_1 through β_{14} represent the elasticities of the rate of minor property crime committed by women with respect to each regressor. The coefficients of the dummy variables are the semielasticities of the rate of minor property crime committed by women with respect to each of the dummies: $E_{(w_{crime})(\beta_i)} = (e^{\beta_i} - 1)(100)$.¹⁶ I treat each dummy solely as an intercept dummy variable and I test the validity of such an assumption in Section 4.

Testable Hypotheses

Due to the non-negative nature of the data and my choice of functional form, it follows that the expected signs for the elasticity (or semielasticity) and first derivative for the i^{th} independent variable are the same as the expected sign of β_i . Therefore, for each regressor, I employ a t-test with a null hypothesis that the estimated coefficient is equal to zero versus the one-tailed alternative hypothesis in the direction of the expected sign. For the second derivative to be statistically significant, the corresponding estimated coefficient must be equal to neither zero nor one. Furthermore, the t-tests for the conditions will also indicate the nature of the elasticity (elastic, unit elastic, inelastic, or zero elastic). Table 2 illustrates the expected signs for each coefficient and the necessary hypothesis tests. The variables in bold relate to marginalization theory and/or opportunity theory and are of particular significance in this paper.

¹⁶ Gujarati (2003), pages 320-1 and 333.

Table 2
Testable Hypotheses

<i>Independent Variable</i>	<i>Expected Sign for Estimated Coefficient</i>	<i>Hypothesis Tests</i>	
Women's Median Income	-	H ₀ : β ₁ =0 H ₁ : β ₁ <0	H ₀ : β ₁ =-1 H ₁ : β ₁ ≠-1
Single Mother Households	+	H ₀ : β ₂ =0 H ₁ : β ₂ >0	H ₀ : β ₂ =1 H ₁ : β ₂ ≠1
Single Mother Households in Poverty	+	H ₀ : β ₃ =0 H ₁ : β ₃ >0	H ₀ : β ₃ =1 H ₁ : β ₃ ≠1
Teenage Pregnancies	+	H ₀ : β ₄ =0 H ₁ : β ₄ >0	H ₀ : β ₄ =1 H ₁ : β ₄ ≠1
Percent Black	+	H ₀ : β ₅ =0 H ₁ : β ₅ >0	H ₀ : β ₅ =1 H ₁ : β ₅ ≠1
Public Assistance Income	-	H ₀ : β ₆ =0 H ₁ : β ₆ <0	H ₀ : β ₆ =-1 H ₁ : β ₆ ≠-1
Women's Unemployment	+	H ₀ : β ₇ =0 H ₁ : β ₇ >0	H ₀ : β ₇ =1 H ₁ : β ₇ ≠1
Women's Labor Force Participation	-	H ₀ : β ₈ =0 H ₁ : β ₈ <0	H ₀ : β ₈ =-1 H ₁ : β ₈ ≠-1
Pink-Collar Occupations	+	H ₀ : β ₉ =0 H ₁ : β ₉ >0	H ₀ : β ₉ =1 H ₁ : β ₉ ≠1
Married Women's Labor Force Participation	+	H ₀ : β ₁₀ =0 H ₁ : β ₁₀ >0	H ₀ : β ₁₀ =1 H ₁ : β ₁₀ ≠1
Women Enrolled in Higher Education	-	H ₀ : β ₁₁ =0 H ₁ : β ₁₁ <0	H ₀ : β ₁₁ =-1 H ₁ : β ₁₁ ≠-1
Women's Age	+	H ₀ : β ₁₂ =0 H ₁ : β ₁₂ >0	H ₀ : β ₁₂ =1 H ₁ : β ₁₂ ≠1
Median Household Income	+	H ₀ : β ₁₃ =0 H ₁ : β ₁₃ >0	H ₀ : β ₁₃ =1 H ₁ : β ₁₃ ≠1
Per-Capita Police Officers	+	H ₀ : β ₁₄ =0 H ₁ : β ₁₄ >0	H ₀ : β ₁₄ =1 H ₁ : β ₁₄ ≠1
Dummy for Metropolitan Area	+	H ₀ : β ₁₅ =0 H ₁ : β ₁₅ >0	N/A
Dummy for State (Michigan=1)	None	H ₀ : β ₁₆ =0 H ₁ : β ₁₆ ≠0	N/A

Additionally, as marginalization theory is largely discussed as a gender specific theory, I posit that marginalization and opportunity factors influence women's crime rates more so than men's crime rates. Therefore, I also compare the estimated elasticities in this women's model to the corresponding elasticities for minor property crime committed by men. In constructing the

men's model, the variables WIncome, WHousehold, WPoverty, WUnemployment, WLabor, WEducation, and WAge from the women's model in Equation 2 change to MIncome, MHousehold, MPoverty, MUnemployment, MLabor, MEducation, and MAge by using the equivalent data for men. While the expected signs of the coefficients (β_i in the women's model, γ_i in the men's model) do not change between the two models, for each marginalization/opportunity variable I expect the coefficient to have a greater impact in the expected direction in the women's model than in the men's model, as indicated in Table 3.

Table 3

Comparison of Expected Elasticities Between Women's Model and Men's Model

<i>Independent Variable</i>	<i>Expected Elasticity Sign</i>	<i>Expected Elasticity Magnitude</i>
Women's/Men's Median Income	–	$\beta_1 < \gamma_1$
Single Mother/Father Households	+	$\beta_2 > \gamma_2$
Single Mother/Father Households in Poverty	+	$\beta_3 > \gamma_3$
Teenage Pregnancies	+	$\beta_4 > \gamma_4$
Percent Black	+	$\beta_5 > \gamma_5$
Public Assistance Income	–	$\beta_6 < \gamma_6$
Women's/Men's Unemployment	+	$\beta_7 > \gamma_7$
Women's/Men's Labor Force Participation	–	$\beta_8 < \gamma_8$
Pink-Collar Occupations	+	$\beta_9 > \gamma_9$
Married Women's Labor Force Participation	+	$\beta_{10} > \gamma_{10}$
Women/Men Enrolled in Higher Education	–	$\beta_{11} \approx \gamma_{11}$
Women's/Men's Age	+	$\beta_{12} \approx \gamma_{12}$
Median Household Income	+	$\beta_{13} \approx \gamma_{13}$
Per-Capita Police Officers	+	$\beta_{14} \approx \gamma_{14}$
Dummy for Metropolitan Area	+	$\beta_{15} \approx \gamma_{15}$
Dummy for State (Michigan=1)	None	$\beta_{16} \approx \gamma_{16}$

3. Data, Statistical Assumptions, and Sample Statistics

Economic analyses of crime commonly use one of two main sources for crime data.¹⁷ The National Crime Victimization Survey (NCVS) is an annual survey of 42,000 households that seeks to reveal the effects of crime upon its victims but does not purport to tally or estimate crime levels nor to indicate the sex of the offenders. The FBI's Uniform Crime Reports (UCR) offer a more appropriate source for this study by fully tallying crime data from each police department in the United States. However, the UCR only indicates sex of persons arrested (sex of the offender is often unknown) and does not allow for direct consideration of the probability of arrest/conviction. While arrest data does not perfectly reflect crime patterns, previous studies commonly use arrest data when actual offence data is not available.¹⁸

Furthermore, while crime data for every county in the United States are available from the National Archive of Criminal Justice Data, limitations on both my time and my economic resources do not allow me to appropriately examine such data. Instead, I choose to employ data for both Michigan and Pennsylvania at the county level. This more limited sample serves to control for the variety of legal and penal systems in place across the United States while still offering a variety of urban and rural areas for analysis.

¹⁷ See Appendix B precise definitions of all variables used in this study (based on the empirical data). Sources for all data either used or mentioned in this study are fully cited in Appendix C.

¹⁸ Macdonald (2000) and Levitt (1995).

Finally, the most appropriate and recent data source for many of the independent variables at the county level is the 2000 U.S. Census. However, due to the nature of the Census and other data sources, I am unable to include a measure of individuals' financial activity.¹⁹ I leave other data discussions for Appendix B.

Table 4
Sample Statistics

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Skewness</i>	<i>St. Dev.</i>	<i>Min.</i>	<i>Max.</i>
Women's Minor Property Crime	247.77	222.69	2.6261	202.04	0	1,565.23
Women's Larceny	119.99	106.57	0.9206	90.09	0	467.32
Women's Fraud	101.83	47.15	3.2217	151.52	0	1,041.61
Women's Forgery	17.01	10.10	4.3328	26.23	0	203.10
Women's Embezzlement	8.94	2.27	2.1264	13.22	0	72.96
Men's Minor Property Crime	424.14	372.91	1.0594	269.64	0	1,460.21
Men's Larceny	257.93	222.70	0.9665	161.27	0	949.33
Men's Fraud	132.87	81.01	2.1761	149.64	0	773.90
Men's Forgery	25.99	19.26	2.0694	30.55	0	175.67
Men's Embezzlement	7.65	2.16	2.3432	12.31	0	64.82
Women's Median Income	15,611.29	15,149	0.9379	2,926.12	9,111	25,493
Men's Median Income	27,894.76	26,867	1.0558	5,076.91	15,857	48,027
Single Mother Households	5.62	5.40	1.8059	1.37	3.00	11.8
Single Father Households	2.20	2.20	-0.1283	0.44	0.80	3.1
Single Mother Households in Poverty	34.15	34.85	0.0905	8.62	17.10	54.4
Single Father Households in Poverty	17.67	17.30	0.4106	6.35	5.54	35.94
Teenage Pregnancies	53.67	46.30	8.5505	44.92	0	58.00
Percent Black	3.49	1.51	4.2294	6.05	0.03	43.22
Public Assistance Income	2.95	2.85	1.4179	1.12	1.22	8.73
Women's Unemployment	5.69	5.36	1.8083	1.88	3.18	14.34
Men's Unemployment	6.82	6.22	1.1284	2.71	2.79	15.06
Women's Labor Force Participation	54.67	54.72	-0.3273	5.11	40.49	64.83
Men's Labor Force Participation	66.46	67.80	-0.7623	7.40	42.26	80.52
Pink-Collar Occupations	40.01	40.45	-0.5683	4.87	25.50	53.30
Married Women's Labor Force Participation	68.56	69.01	-0.6266	3.48	58.53	74.89
Women Enrolled in Higher Education	6.89	5.47	3.2088	5.04	2.16	38.08
Men Enrolled in Higher Education	5.80	4.50	3.2077	5.25	0.77	34.06
Women's Age	19.28	19.23	1.6726	3.24	12.63	36.52
Men's Age	19.98	19.98	1.5181	3.50	12.33	36.95
Median Household Income	37,904.09	35,936	1.4053	7,624.25	26,622	67,400
Per-Capita Police Officers	155.01	141.04	3.1669	76.10	38.44	637.81
Dummy for Metropolitan Area	0.39	0	0.4702	0.49	0	1
Dummy for State (Michigan=1)	0.45	0	0.2167	0.50	0	1

¹⁹ Credit cards, for instance, provide an opportunity to commit fraud (see Steffensmeier and Allan (1996)).

Table 4, above, displays the relevant sample statistics for all 150 counties. Note the large standard deviation in both women's and men's minor property crime rates and in many of the independent variables. Therefore, I do not expect many observations to have high leverage and, in fact, in the women's (men's) model only eleven (nine) counties have high leverage.

Past studies of crime do not uniformly consider multicollinearity between the regressors while, of those that do, multicollinearity is often found to exist.²⁰ I use three measures of multicollinearity, Pearson Correlation Coefficients, the variance-inflating factor (VIF), determine that there is significant multicollinearity between the regressors in both the men's and women's samples (as would be expected due to the related nature of many of the independent variables). This multicollinearity may mask some of the true relationships between variables.

I must also discuss three structural matters in this study. First, while changes in crime rates could possibly lag behind changes in the regressors, consideration of lags would require a complex set of analyses due to varying lags across each of the regressors and, thus, I assume such lags to be negligible. Second, in order to use aggregate data from the UCR, I make the simplifying assumption that people are homogeneous in all ways except those based on the variables in this paper.²¹ Third, because only a small fraction of the population is actively engaged in crime, I assume any issues of simultaneity to be negligible for both models.²²

²⁰ Allen (1996) and Ralston (1999) do not find multicollinearity to be a problem in their empirical analyses of property crime while, in a study similar to this one, Cohen and Cohen (1983) do find multicollinearity.

²¹ Ehrlich (1996), Brier and Fienberg (1980), and Leung (1994) and Allen (1996).

²² Ehrlich (1996) discusses how correcting for simultaneity does not alter the incentive structure of crime.

4. Overall Quality of the Empirical Models

For the statistical analyses in this paper, I organize the data alphabetically by county and limit analysis to one year. Therefore, there should be no sequencing of the data and, as I expect, the Durbin-Watson, Breusch-Pagan, Lagrange Multiplier (Ljung-Box), and Maximum Likelihood Tests each indicate no first-order autocorrelation in either model.

For this paper, the White Test of heteroskedasticity indicates that the error term variance is not a function of the independent variables, their squared values, or their cross products in either model (p-value of 0.5269 for the women's model and 0.6328 for the men's model).²³ Furthermore, while Ehrlich posits heteroskedasticity as a function of population,²⁴ the Lagrange Multiplier Test and the Breusch-Pagan-Godfrey Test each indicate that error term variance is not a function of county population. However, both tests indicate that the error term variance is a function of the predicted value and the square of the predicted value of the natural log of minor property crime rates in both models. While weighted least squares (WLS) correction procedures fail to correct for this heteroskedasticity as a function of the predicted value, the procedures do correct for heteroskedasticity as a function of the square of the predicted value and I employ and analyze such WLS models for the remainder of this paper.

As depicted in Table 5, the F-test indicates that each model is statistically significant as a whole at the 5% level of significance. In addition, while the results of the maximum coefficient of determination (R^2) and adjusted R^2 criterion are mixed, since the AIC is the most widely

²³ While Ralston (1999), Elliot and Ellingworth (1998), and Brier and Feinberg (1980) do not find heteroskedasticity in their empirical models, past studies have not regularly addressed heteroskedasticity.

²⁴ Ehrlich (1973).

preferred criterion I conclude that the WLS model has the higher explanatory power for both the women's and the men's models. Furthermore, the overall goodness of fit of each of these regressions is comparable to that of other cross-sectional studies that do not incorporate measures of the probability of arrest/conviction and severity of sentence.²⁵

Table 5

Overall Explanatory Power and Goodness of Fit

	<i>Model</i>	<i>F-test p-value</i>	<i>R²</i>	<i>Adjusted R²</i>	<i>AIC</i>
Women's Model	OLS	0.0083	0.2136	0.1161	344.8917
	WLS	0.0181	0.1981	0.0986	-131.87957
Men's Model	OLS	0.0007	0.2545	0.1634	321.7035
	WLS	0.0004	0.2625	0.1724	-192.89323

Finally, for the women's (men's) model the Chow test of parameter stability has a p-value of 0.2673 (0.1891) when testing for stability across the two states and a p-value of 0.8589 (0.6946) when testing for stability across metropolitan versus non-metropolitan counties. Therefore, I conclude that consideration of slope dummy variables would be inappropriate and I continue to employ only intercept dummy variables.

²⁵ Witt and Witte (1998), Elliot and Ellingworth (1998), and Britt (1997).

5. Interpretation of Empirical Results

Table 6 summarizes the regression results for the estimations of the first and second derivatives and elasticities, Table 7 contains hypothesis test results for the marginalization and/or opportunity variables, and Table 8 contains hypothesis test results for the control variables.

Table 6
Results, First and Second Derivatives and Elasticities

<i>Variable</i>	<i>First Derivative (on average)</i>		<i>Second Derivative (on average)</i>		<i>Elasticity (Semielasticity for the dummy variables)</i>	
	<i>Expected Sign</i>	<i>Estimated Value</i>	<i>Expected Sign</i>	<i>Estimated Value</i>	<i>Expected Sign</i>	<i>Estimated Value</i>
WIncome	-	0.00138	+	-8.07E-08	-	0.08698
MIncome	-	0.00078	+	-2.55E-08	-	0.08786
WHousehold	+	51.7129	-	1.5916	+	1.17297
MHousehold	+	30.9701	-	-10.2062	+	0.27499
WPoverty	+	-0.90489	-	0.0298	+	-0.12472
MPoverty	+	-2.47658	-	0.1649	+	-0.17662
Pregnancies (W)	+	-0.26005	-	0.0051	+	-0.05633
Pregnancies (M)	+	1.42453	-	-0.0184	+	0.30857
Black (W)	+	1.09686	None	-0.3094	+	0.01545
Black (M)	+	1.72445	None	-0.4821	+	0.02429
Assistance (W)	-	-55.5979	+	31.3225	-	-0.66196
Assistance (M)	-	0.0648	+	-0.0219	-	0.000771
WUnemployment	+	14.1756	-	-1.6803	+	0.32554
MUnemployment	+	-2.0181	-	0.3124	+	-0.05555
WLabor	-	-13.7166	+	1.0103	-	-3.02654
MLabor	-	-4.3734	+	0.1430	-	-1.1731
Occupations (W)	+	-0.81651	None	0.0231	+	-0.13185
Occupations (M)	+	3.30876	None	-0.0385	+	0.5343
MarriedLabor (W)	+	13.4325	-	0.5323	+	3.71689
MarriedLabor (M)	+	-4.1790	-	0.1314	+	-1.15636
WEducation	-	8.51732	+	-0.9434	-	0.23685
MEducation	-	9.50967	+	-1.2746	-	0.22261
WAge	+	3.83067	-	-0.1395	+	0.29808
MAge	+	5.24112	-	-0.1515	+	0.42264
Income (W)	+	0.00342	-	-4.30E-08	+	0.52292
Income (M)	+	-0.00407	-	1.74E-07	+	-0.62331
Police (W)	+	0.00155	-	-9.96E-06	+	0.00097
Police (M)	+	-0.22971	-	1.69E-03	+	-0.14371
DummyMetropolitan (W)	None	N/A	None	N/A	+	-10.42644
DummyMetropolitan (M)	None	N/A	None	N/A	+	1.93243
DummyState (W)	None	N/A	None	N/A	None	55.23501
DummyState (M)	None	N/A	None	N/A	None	85.86678

Table 7

Results, Hypothesis Tests: Marginalization and/or Opportunity Variables

<i>Variable</i>	<i>Expected Sign</i>	<i>Estimated β_i or γ_i (st. error)</i>	<i>$H_0: \beta_i$ or $\gamma_i = 0$ $H_1: \text{Expected}$</i>	<i>$H_0: \beta_i$ or $\gamma_i = 0$ $H_1: \text{Opposite}$</i>	<i>$H_0: \text{abs}(\beta_i)$ or $\text{abs}(\gamma_i) = 1$ $H_1: \text{Upper Tail}$</i>	<i>$H_0: \text{abs}(\beta_i)$ or $\text{abs}(\gamma_i) = 1$ $H_1: \text{Lower Tail}$</i>	<i>$H_0: \beta_i = \gamma_i$ $H_1: \text{Expected}$</i>
WIncome	-	0.08698 (1.06621)		0.4676		Unnecessary	0.4997
MIncome	-	0.08786 (0.89314)		0.4609		Unnecessary	
WHousehold	+	1.17297 (0.77894)	0.0672*		0.2500		0.1255
MHousehold	+	0.27499 (0.34220)	0.2116			Unnecessary	
WPoverty	+	-0.12472 (0.52045)		0.4050		Unnecessary	0.4604
MPoverty	+	-0.17662 (0.23409)		0.2260		Unnecessary	
Pregnancies (W)	+	-0.05633 (0.22193)		0.4000		Unnecessary	
Pregnancies (M)	+	0.30857 (0.19812)	0.0609*			0.0003***	
Black (W)	+	0.01545 (0.06657)	0.4085			Unnecessary	
Black (M)	+	0.02429 (0.06877)	0.3623			Unnecessary	
Assistance (W)	-	-0.66196 (0.48469)	0.0872*			0.2434	0.0869*
Assistance (M)	-	0.000771 (0.33111)		≈ 0.5		Unnecessary	
WUnemployment	+	0.32554 (0.33988)	0.17			Unnecessary	0.1321
MUnemployment	+	-0.05555 (0.32280)		0.4318		Unnecessary	
WLabor	-	-3.02654 (2.74662)	0.1363			Unnecessary	0.2505
MLabor	-	-1.17310 (1.06574)	0.1365			Unnecessary	
Occupations (W)	+	-0.13185 (0.57862)		0.4101		Unnecessary	
Occupations (M)	+	0.53430 (0.53883)	0.1616			Unnecessary	
MarriedLabor (W)	+	3.71689 (2.69022)	0.0848*		0.1572		0.0362**
MarriedLabor (M)	+	-1.15636 (1.44037)		0.2118		Unnecessary	

Table 8
Results, Hypothesis Tests: Control Variables

<i>Variable</i>	<i>Expected Sign</i>	<i>Estimated β_i or γ_i (st. error)</i>	<i>$H_0: \beta_i$ or $\gamma_i = 0$ $H_1:$ Expected</i>	<i>$H_0: \beta_i$ or $\gamma_i = 0$ $H_1:$ Opposite</i>	<i>$H_0: abs(\beta_i)$ or $abs(\gamma_i) = 1$ $H_1:$ Upper Tail</i>	<i>$H_0: abs(\beta_i)$ or $abs(\gamma_i) = 1$ $H_1:$ Lower Tail</i>	<i>$H_0:$ $\beta_i = \gamma_i$ $H_0:$ $\beta_i \neq \gamma_i$</i>
WEducation	-	0.23685 (0.25146)		0.1740		Unnecessary	
MEducation	-	0.22261 (0.17904)		0.1080		Unnecessary	
WAge	+	0.29808 (1.03189)	0.3866			Unnecessary	
MAge	+	0.42264 (0.71338)	0.2775			Unnecessary	
Income (W)	+	0.52292 (1.41396)	0.3561			Unnecessary	0.4190
Income (M)	+	-0.62331 (1.02432)		0.2720		Unnecessary	
Police (W)	+	0.000967 (0.19954)	0.4981			Unnecessary	0.4697
Police (M)	+	-0.14371 (0.17886)		0.2116		Unnecessary	
Dummy-Metropolitan (W)	+	-0.11011 (0.20362)		0.2948		N/A	N/A
Dummy-Metropolitan (M)	+	0.01914 (0.19278)	0.4606			N/A	
Dummy-State (W)	None (assume +)	0.43977 (0.22215)	0.0499**			N/A	N/A
Dummy-State (M)	None (assume +)	0.61986 (0.20442)	0.0029***			N/A	

The estimated value of the constant in the women's (men's) model is -6.8979 (7.5067) with a standard deviation of 15.8558 (11.2218). Such values are mathematical extrapolations. In Table 6, Table 7, and Table 8, (W) designates the women's model and (M) designates the men's model. All tests in Table 7 and in Table 8 are t-tests. Blank cells indicate that the missing p-value is greater than 0.5. P-values with a star (*) are significant at the 10% level, (**) indicates significance at the 5% level, and (***) indicates significance at the 1% level. The first column of hypothesis tests in Table 7 and in Table 8 tests the null hypothesis that the estimated coefficient is equal to zero against the expected alternative. The next column tests the null hypothesis that the estimated coefficient is equal to zero against the alternative that is the

opposite of my expectation. The next two columns, which are only necessary if the estimated coefficient is not equal to zero, tests the null hypothesis that the magnitude of the estimated coefficient is equal to one against the alternative that it is greater than one and against the alternative that it is less than one. The final column tests the null hypothesis that the magnitudes of the estimated coefficients are equal across models against the expected alternative.

Seven counties in the women's model and eight counties in the men's model hold inordinate influence as measured by RStudent, DFFits, CovRatio, and Cook's Distance. However, recalculation of both models excluding such counties does not significantly change the F-test and t-test conclusions and data collection procedures do not indicate any sampling errors, so I retain the full sample of all 150 counties.

Evaluation of Testable Hypotheses

For the women's model, I posit that an increase in both the percentage of single mother households and married women's labor force participation rate should lead to higher crime rates, and the empirical results indicate that a 1% increase in both variables leads to a 1% increase in the rate of minor property crime committed by women. Additionally, I expect an increase in public assistance income to lead to decreased crime rates, and the empirical results indicate that a 1% increase in the percentage of households receiving public assistance income leads to a 1% drop in the rate of minor property crime committed by women. Moreover, as I expect, public assistance income and married women's engagement in the labor force each have more significant influence on women's crime rates than on men's crime rates.

For the men's model, I posit that an increase in teenage pregnancies should lead to higher crime rates, and the empirical results indicate that a 1% increase in the teenage pregnancy rate leads to a 0.3% increase in the rate of minor property crime committed by men. Possibly, while teenage pregnancies likely lead to the marginalization of women, the result of pregnancy (a child) may increase the opportunity of cost of crime for women more than for men.

The dummy for state is the only significant control variable. Rates of women's (men's) minor property crime are approximately 55.24% (85.87%) higher in Michigan than in Pennsylvania.

6. Summary and Conclusions

By using cross-sectional analyses to control for the impact of changing social norms and values, this study effectively analyzes the economic marginalization theory of women's crime and the empirical results somewhat substantiate the theory. Public assistance income plays an important role in reducing women's minor property crime rates, and such rates directly related to the percentage of households that are headed by single mothers. Furthermore, while this study finds that men's minor property crime rates are more responsive than women's rates to teenage pregnancies, such a finding should be viewed cautiously because the development of economic marginalization is closely tied to gender and applies largely to women. Overall, the results generally support the assumption that marginalization affects women more strongly than it does men. The results also partially substantiate the opportunity theory of women's crime and buttress existing time-series analyses by indicating that women's crime responds more acutely to married women's engagement in the labor force than to women's overall engagement in the labor force.²⁶

This study stands apart from the general literature because I conclude that age, race, and urban/rural location do not significantly explain the variation in women's minor property crime.²⁷ Many of these past studies have not considered the diversity of employment variables, income variables, and other characteristics of economic marginalization theory and opportunity theory analyzed in this paper. It appears likely that a significant degree of the variation in

²⁶ In particular, see Witt and Witte (1998), Allen (1996), and Phillips and Votey, Jr., (1987). However, Bartel (1979) finds that married women's labor force participation does not influence women's crime rates.

²⁷ Phillips and Votey, Jr., (1984), however, do also find race to be an insignificant component in the supply of crime.

women's crime previously accounted for in age, race, and urban/rural variables may be more appropriately accounted for in factors such as public assistance income and married women's labor force participation rate.

There remain a few avenues for refinement of this study and for further exploration. Adding excluded independent variables, in particular measures of individual financial activity and the probability of arrest/conviction, would improve the specification and relevance of the model. Additionally, further analyses could reasonably address the interactions and cross-derivatives between the independent variables, such as the interaction of public assistance income and single-mother households. Consideration of each of the many components of public assistance income would help indicate which ones significantly serve to reduce women's crime. Similarly, consideration of each of the individual minor property crime categories alone could provide insight into the influence of economic factors on the composition of minor property crime.

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Appendix A, Definitions of Crime Categories²⁸

Larceny-theft (except motor vehicle theft)

The unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another. Examples are thefts of bicycles or automobile accessories, shoplifting, pocket-picking, or the stealing of any property or article which is not taken by force and violence or by fraud. Attempted larcenies are included. Embezzlement, confidence games, forgery, worthless checks, etc., are excluded.

Forgery and counterfeiting

Making, altering, uttering, or possessing, with intent to defraud, anything false in the semblance of that which is true. Attempts are included.

Fraud

Fraudulent conversion and obtaining money or property by false pretenses. Confidence games and bad checks, except forgeries and counterfeiting, are included.

Embezzlement

Misappropriation or misapplication of money or property entrusted to one's care, custody, or control.

²⁸ As defined by the Federal Bureau of Investigation (2001), pp. 407-8.

Appendix B, Definitions of Variables²⁹

Women's (Men's) Minor Property Crime

Number of minor property crimes committed by women (men) aged eighteen or older per 100,000 such women (men).

Women's (Men's) Median Income

Median earnings (in dollars) of women (men) aged sixteen or older who have earnings.

Single Mother (Father) Households

Percentage of total households that are headed by a woman (man) with no male (female) householder present and with at least one of the woman's (man's) own children under the age of eighteen present.

Women-Headed (Men-Headed) Households in Poverty

Percentage of women-headed (men-headed) households with children that are in poverty, as classified by the U.S. Census Bureau. *While the best available measure of poverty, this variable does not address the number or the age of children, the human capital accumulation of women, or the degree of poverty and is measures for the year 1999 (unlike 2000, as with the all other variables).*

²⁹ As defined by the appropriate source in Appendix C.

Teenage Pregnancies

Number of reported pregnancies (the sum of reported live births, fetal deaths, and induced abortions) to women between the ages of fifteen and nineteen per 1,000 people in the population. *While data for Pennsylvania concern the year 2000, the best available data for Michigan are from the year 2001. However, I assume that the data for Michigan is functionally equivalent to data for the year 2000.*

Percent Black

Percentage of the total population that self-identifies as only black. *However, the U.S. Census survey also allows an individual to identify as two or more races.*

Public Assistance Income

Percentage of total households that receive some form of public assistance income. *Ideally, this variable would measure spending on TANF, school lunch programs, or some other similar social welfare program targeted specifically to women and children. However, no such measure is available at the county level.*

Women's (Men's) Unemployment

Percentage of women (men) aged eighteen or older in the labor force that are unemployed.

Women's (Men's) Labor Force Participation

Percentage of women (men) aged eighteen or older that are in the labor force.

Pink-Collar Occupations

Percentage of total employed civilian population that works in either the service, sales, or office occupation categories. *Available U.S. Census data groups jobs into broad categories. Therefore, by choosing to include the clerical, sales, and office categories I am excluding other pink-collar occupations, such as much of the service sector.*

Married Women's Labor Force Participation

Percentage of married-couple families (in which the husband is in the labor force or in the armed forces) in which the wife is in the labor force.

Women (Men) Enrolled in Higher Education

A percentage formed by dividing the total number of women (men) age eighteen or older by the total number of women (men) enrolled in higher education, then multiplying that number by one hundred. *In the construction this variable, I assume that only an insignificant number of women (men) under the age of eighteen enroll in higher education.*

Women's (Men's) Age

Percentage of women (men) that are between the ages of eighteen and thirty-four.

Median Household Income

Median household income (in dollars).

Police Officers

Number of full-time police officers per 100,000 people in the population. *As the only available measure of law enforcement or legal policy at the county level, this variable may not act as a good proxy for the probability of arrest/conviction. Also, while arrests at many colleges and universities are included in UCR data, some campus police departments do not employ official police officers, thereby skewing the results. Additionally, part-time officers and support staff are not accounted for in this variable, but could possibly influence arrests. Finally, increased numbers of police officers should entail more effective investigation and, ceteris paribus, higher arrest rates (the actual dependent variable for this analysis), thereby further buttressing my expectation of a positive relationship between the rate of minor property crime committed by women/men and the per-capita number of police officers.*

Dummy for Metropolitan Area

Takes a value of one for a county containing a metropolitan area and zero otherwise, with a metropolitan area defined as a county containing at least one urban area of 50,000 or more residents.

Dummy for State

Takes a value of one for Michigan and a value of zero for Pennsylvania.

Appendix C, Data Sources

WCrime, MCrime, and Police

Michigan State Website. 2003. "Uniform Crime Reports: Crime Statistics,"

<<http://www.state.mi.us/msp/cjic/ucrstats/County/Jurisdiction%20Totals>> (16 November 2003).

Michigan State Website. 2001. "Crime In Michigan: 2000 Uniform Crime Report,"

<http://www.michigan.gov/msp/0,1607,7-123-1645_3501_4621-26742--,00.html> (16 November 2003).

Pennsylvania State Website. 2003. "Pennsylvania Uniform Crime Reporting System,"

<<http://ucrreport.psp.state.pa.us/UCR/Reporting/Query/Summary/QuerySumArrestUI.asp>> (16 November 2003).

WIncome, MIncome, WHousehold, MHousehold, WPoverty, MPoverty, Black, Assistance, WUnemployment, MUnemployment, WLabor, MLabor, Occupations, MarriedLabor, WEducation, MEducation, WAge, MAge, Income

U.S. Census Bureau. 2003. "American Fact Finder, Quick Tables,"

<http://factfinder.census.gov/servlet/SAFFFacts?geo_id=&_geoContext=&_street=&_county=&_cityTown=&_state=&_zip=&_lang=en&_sse=on> (19 November, 2003).

Pregnancies

Michigan State Website. 2003. "Vital Statistics: Natality and Pregnancy,"

<<http://www.mdch.state.mi.us/PHA/OSR/index.asp?Id=2>> (16 November 2003).

Pennsylvania State Website. 2003. "Reported Pregnancies by Outcome, Woman's Age Group and County of Residence, Pennsylvania, 2000,"

<<http://www.dsf.health.state.pa.us/health/lib/health/2000%20countyreg.pdf>> (16 November 2003).

DummyMetropolitan

U.S. Census Bureau. 1999. "Historical Metropolitan Area Definitions,"

<<http://www.census.gov/population/www/estimates/pastmetro.html>> (16 November 2003).

General Other Crime Data (for reference)

Bureau of Justice Statistics. 2003. "Criminal Victimization Data Collections," 27 October 2003,

<<http://www.ojp.usdoj.gov/bjs/cvict.htm#Programs>> (16 November 2003).

Federal Bureau of Investigation. 2003. "Uniform Crime Reports,"

<<http://www.fbi.gov/ucr/ucr.htm>> (16 November 2003).

National Archive of Criminal Justice Data, part of the Inter-university Consortium for Political

and Social Research (ICPSR). 2003. <<http://www.icpsr.umich.edu/NACJD/index.html>> (16 November 2003).

References

- Albelda, Randy. 1999. "Women and Poverty: Beyond Earnings and Welfare." *Quarterly Review of Economics and Finance* (Special Issue) 39:723-42.
- Allen, Ralph C. 1996. "Socioeconomic Conditions and Property Crime: A Comprehensive Review and Test of the Professional Literature." *American Journal of Economics and Sociology* 55.3:293-308.
- Bartel, Ann P. 1979. "Women and Crime: An Economic Analysis." *Economic Enquiry* 17.1:29-51.
- Becker, Gary. 1968. "Crime and Punishment: An Economic Approach." *The Journal of Political Economy* 76.2:169-217.
- Borjas, George J. 1999. *Labor Economics*. Second Edition. Boston: McGraw-Hill.
- Brier, Stephen S. and Stephen E. Fienberg. 1980. "Recent Econometric Modeling of Crime and Punishment: Support for the Deterrence Hypothesis." *Evaluation Review* 4.2:147-91.
- Britt, Chester L. 1997. "Reconsidering the Unemployment and Crime Relationship: Variation by Age Group and Historical Period." *Journal of Quantitative Criminology* 13.4:405-28.
- Cohen, Jacob and Patricia Cohen. 1983. *Applied Multiple Regression/Correlation for the Behavioral Sciences*. Second Edition. London: Lawrence Erlbaum Associates.
- Ehrlich, Isaac. 1973. "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation." *The Journal of Political Economy* 81.3:521-65.
- Ehrlich, Isaac. 1996. "Crime, Punishment, and the Market for Offences." *The Journal of Economic Perspectives* 10.1:43-67.

- Elliot, Caroline and Dan Ellingworth. 1998. "Exploring the Relationship between Unemployment and Property Crime." *Applied Economics Letters* 5.8:527-30.
- Federal Bureau of Investigation. 2001. "Crime in the United States: 2000," <http://www.fbi.gov/ucr/cius_00/00crime7.pdf> (24 November 2003).
- Fox, Vivian C. 1997. "Women's Poverty as a Link to the Poverty of Children." *Journal of Psychohistory* 24.3:287-95.
- Grasmick, Harold G., Nancy J. Finley, and Deborah L. Glaser. 1984. "Labor Force Participation, Sex-Role Attitudes, and Female Crime." *Social Science Quarterly* 65.3:703-18.
- Gujarati, Damodar. 2003. *Basic Econometrics*. Fourth Edition. Boston: McGraw-Hill.
- Hakim, Simon, Uriel Spiegel, and J. Weinblatt. 1984. "Substitution, Size Effects, and the Composition of Property Crime." *Social Science Quarterly* 65.3:718-34.
- Ihlanfeldt, Keith. 2002. "Spatial Mismatch in the Labor Market and Racial Differences in Neighborhood Crime." *Economics Letters* 76.1:73-6.
- Leung, Siu Fai. 1994. "An Economic Analysis of the Age-Crime Profile." *Journal of Economic Dynamics and Control* 18.2:481-97.
- Levitt, Steven D. 1995. "Why do Increased Arrest Rates Appear to Reduce Crime: Deterrence, Incapacitation, or Measurement Error?" NBER Working paper No. 5268.
- Macdonald, Ziggy. 2000. "The Impact of Under-Reporting on the Relationship between Unemployment and Property Crime." *Applied Economics Letters* 7.10:659-63.
- Phillips, Llad and Harold L. Votey, Jr. 1984. "Black Women, Economic Disadvantage, and Incentives to Crime." *The American Economic Review* 74.2:293-97.

- Radosh, Polly. 1990. "Women and Crime in the United States: A Marxian Explanation." *Sociological Spectrum* 10.1:105-31.
- Ralston, Roy W. 1999. "Economy and Race: Interactive Determinants of Property Crime in the United States, 1958-1995: Reflections on the Supply of Property Crime." *American Journal of Economics and Sociology* 58.3:405-34.
- Rodgers, Harrell R., Jr. 1996. *Poor Women, Poor Children: American Poverty in the 1990s*. Third Edition. Armonk, N.Y. and London: Sharpe.
- Simon, Rita James and Jean Landis. 1991. *The Crimes Women Commit, the Punishments They Receive*. Lexington, Mass: Lexington.
- Small, Kevonne. 2000. "Female Crime in the United States, 1963-1998: An Update." *Gender Issues* 18.3:75-90.
- Steffensmeier, Darrell J. 1980. "Sex Differences in Patterns of Adult Crime, 1965-77: A Review and Assessment." *Social Forces* 58.4:1080-108.
- Steffensmeier, Darrell and Emilie Allan. 1996. "Gender and Crime: Toward a Gendered Theory of Female Offending." *Annual Review of Sociology* 22:459-87.
- U.S. Census Bureau. 2001. "Poverty 2000," <http://www.census.gov/hhes/poverty/threshld/thresh00.html> (12 December, 2003).
- U.S. Census Bureau. 2003a. "American Fact Finder, Data Sets," http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=DEC&_lang=en&_ts (17 November 2003).
- Witt, Robert and Ann Dryden Witte. 1998. "Crime, Imprisonment, and Female labor Force Participation: A Time-Series Approach." NBER Working paper No. 6786.