



Modernization, Inequality, Routine Activities, and International Variations in Household Property Crimes

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Abstract

Using data from the International Crime Victimization Survey, we investigate the relative contribution of macro-level variables (democracy level, economic development, world system status, inequality) and individual-level variables (marital status, age, gender, education, income) in predicting the occurrence and intensity of household property crime victimization (burglary, theft from vehicle, and vehicle theft). The study utilizes multilevel regression analysis, which controls for the “nesting” of individuals living in the same nation and controls for unmeasured random effects among the 42 nations under study. The results of the zero-inflated negative binomial (ZINB) regression analysis indicate that all of the individual demographic characteristics have some effect on household property crime victimization as do some macro-level variables (economic development and world system status).

Key Words: international crime victimization; democracy; modernization; world system; inequality; routine activities; multilevel regression.

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Introduction

International comparisons of crime victimization represent a relatively new area of criminological research. Most studies of international differences in crime use official statistics generated by governmental agencies (Fajnzylber, Lederman & Loayza, 1998; Lafree & Tseloni, 2006; Reichel, 2002). An important feature of the current study is that it is one of the few studies (Neapolitan, 2003; Uludag, Colvin, Hussey & Eng, 2009) to utilize self-report crime victimization data from samples of citizens in multiple nations. Another important feature of this study is that a variety of theoretical explanations of international variations in crime victimization are compared. The study evaluates the relative strength of variables related to modernization (democracy level, economic development) and inequality (world system status and internal levels of inequality) as well as individual-level variables related to routine activities and lifestyles (marital status, age, gender, education, and income) in explaining household property crime victimization (burglary, theft from vehicle, and vehicle theft).

The study utilizes data from the International Crime Victimization Survey (ICVS, 2003), a self-report victimization survey that uses standardized questionnaire items to measure whether or not respondents have been victims of household property crime (occurrence of victimization) and, if so, how often they have been victims (intensity of victimization). Given that individual respondents live under the same macro-level context in each of the 42 nations from which samples were drawn, the study utilizes multilevel regression to take into account these “nesting” effects among individuals in the international survey and to take into account the random effects of country-level variables not directly measured in the analysis. Because this study utilizes self-reported victimization data and multi-level regression analysis and tests a variety of theoretical explanations, it represents an important contribution to the field of comparative criminology.

Modernization, Inequality, Routine Activities and Crime Victimization

Three sets of variables inform this exploratory study of individuals’ experiences with crime victimization in forty-two nations: 1) Modernization, which focuses on two elements: level of democracy and level of economic development. 2) Inequality, which also has two dimensions: inequality among nations in the modern world system and inequality within each nation. 3) Routine Activities, focusing on individual demographic characteristics connected to lifestyles and daily activities that make individuals more or less likely to be victims of crime.

Modernization and crime victimization

Modernization theory focuses on two elements of development, one political and the other economic. Modernization involves expansion of democratic governance and economic development characterized by free market mechanisms that presumably lead to greater economic output and national well-being. The modernization perspective assumes that all nations have (or will) follow stages of political and economic development similar to those experienced by Western societies (Almond & Powell, 1968; Rostow, 1991). According to modernization theorists, fully modern societies, because of rapid technological advances, have relatively higher levels of economic output and democratic

processes of governance, which together promote general welfare and human development through enhanced literacy, medical care, sanitation, and consumerism.

Modernization theory has been used to explain international variations in crime (Heiland & Shelley, 1992; Shelly, 1981). These criminologists suggest (with some support from official crime data) that greater modernization (democratic development and economic development) generally leads to lower crime and to shifts in crime patterns toward relatively more property crimes.

Democracy and Crime Victimization

The relationship between the level of democracy and crime has not been studied until recently (Karstedt & LaFree, 2006). The existing literature suggests that crime increases during the initial process of democratization, but declines later (LaFree & Tseloni, 2006; Neumayer, 2003). The connection between rising crime rates and transition to democracy has been questioned by Shaw (2002) who notes the unreliability of crime data that encompass pre-transition and post-transition periods, since most of the transition countries do not have appropriate infrastructures and institutions for reliable crime statistics.

In light of Shaw's questions, proposing an inverse correlation between level of democracy and crime rates, rather than proposing a positive correlation linking transition from autocracy to democracy to rising crime rates, seems an appropriate avenue to explore. In fact, recent research indicates an inverse relationship between level of democracy and levels of crime using official crime data (Lafree & Tseloni, 2006; Neumayer, 2003).

"Level of democracy" is the most frequently used term to conceptualize quantitative measures of democracy (McClintock & Lebovic, 2006). We avoid the term "quality of democracy" since it is vague, and debate among scholars about its meaning has been intense (Munck & Verkuilen, 2002).

Several scholars offer criteria to indicate the level of democracy (Beetham, Bracking, Kearton & Weir, 2002; Diamond & Morlino, 2004). These scholars' ideas are reflected in the criteria used by Freedom House (1998), which designates a nation's level of democracy by its political rights and civil liberties. Freedom House indicators (which we discuss in detail later) are the most widely used measure of the level of democracy (McClintock & Lebovic, 2006).

There are theoretical reasons to expect an inverse relationship between nations' levels of democracy and crime victimization. The Civilization Perspective (Elias, 1982 [1939]) suggests that a decline in crime victimization occurs as countries complete the modernization process, becoming increasingly civil and subject to the rule of law under republican forms of representative governance (Heiland & Shelley, 1992). In democracies, formal institutions are established in which self-interest can be pursued through nonviolent processes in which open conflict is regulated and rights (most especially property rights) are protected. Moreover, a greater appreciation for the dignity of each individual and thus greater support for human rights and property rights emerges from this civilizing process, which promotes the rise of democracy. The development of the state toward democratic policies and institutions thus coincides with, and is part of, the civilizing process, which, as part of modernization, leads to declines in crime (Heiland & Shelley, 1992; Lafree & Tseloni, 2006; Neumayer, 2003). Thus, the first question explored in this study: *Does the level of a nation's democracy predict the level of household property crime victimization for citizens of that nation?*

Economic Development and Crime Victimization

Economic development is seen as the necessary underpinning for modernization. The modernization process involves economic changes that disrupt traditional cultures and social structures during the takeoff stages of development; but eventually the modernization process creates social stability as economic development reaches the final stage leading to a full-blown market economy. Modernization theorists tend to highlight the positive aspects of economic development, which contrasts sharply with world system theorists discussed in the next section.

Modernization theory predicts that crime increases during the take off stage of economic development, but decreases as economic development progresses (Shelley, 1981). Furthermore, as economic development progresses, property and economic crimes become more dominant over crimes against persons (Heiland & Shelley, 1992). Several studies indicate an inverse relationship between the measures of economic development (indicated by per capita gross domestic product, GDP) and crime rates (Krahn, Hartnagel, & Gartrell, 1986; LaFree and Drass, 2002; LaFree & Kick, 1986; Messner & Rosenfeld, 1997; Rushton & Whitney, 2002). Other studies find no effect of economic development on officially reported crime (Bennett 1991b; Pampel & Gartner 1995). Neapolitan (2003) and found no relation between GDP per capita and international variations in crime victimization.

Other scholars report varying results when relating GDP per capita to property and violent crimes. Bouley and Vaughn (1995), Heiland and Shelly (1992), Kick and LaFree (1985), Neapolitan (1997), and Shelly (1981) found that GDP per capita is significantly and positively associated with property crimes and negatively associated with violent crimes. Likewise, Bennett (1991a), LaFree and Kick (1986) and Messner (1986) report a positive relationship between GDP per capita and theft rates.

Since most of these studies use official crime data, it remains an open question whether victimization surveys will replicate these findings concerning the effects of economic development. Previous research is somewhat mixed on the effects of economic development on household property crime victimization. Modernization theory suggests that property crimes will be higher relative to violent crimes as economic development increases, but also suggests that overall crime rates will decrease. Thus, the second question explored in this study: *Does the level of a nation's economic development predict the level of household property crime victimization among citizens of that nation?*

Inequality among and within Nations and Crime Victimization

The idea that inequality among and within nations may be related to variations in crime victimization is drawn from Marxist Theory, which argues that capitalist relations of exploitation spread across the world. The class structure of capitalism arose through a process of struggle between the owners of capital and those who must sell their labor power to capital. These classes are placed in relations of antagonism due to the underlying imperatives of capital accumulation (Greenberg, 1981). As capitalists compete to expropriate higher levels of surplus value from workers (which is the source of their profits), wealth, used to produce further wealth, increases. The distribution of this wealth is determined by economic and political struggle, which across time and space leads to variations in levels of economic inequality. This struggle takes place both within nations (determining national levels of inequality) and among nations, which, through processes of

dependency and unequal development (Amin, 1976; Payne, 2005), creates inequality among nations within the modern world system (Wallerstein, 1979, 2004).

Inequality in the Modern World System and International Variations in Crime

With capitalist development, capitalist relations invade more and more nations. Because of this expansion, nations lose their political and economic autonomy and become actors in an international political-economic system. This process leads to a world system of interdependent nations, some core and others periphery. In this context, stronger (core) nations economically and politically exploit the weaker (periphery) nations. The Marxist/World System perspective (in contrast to modernization theory) argues that periphery nations remain underdeveloped because core nations' wealth, to a great extent, derives from the exploitation of the resources of periphery nations (Chirot & Hall, 1982; Wallerstein, 1979, 2004).

Exploitation of periphery nations by core nations leads to increasing poverty and unemployment, and thus to social and psychological strain, which produces higher levels of crime victimization for people living in periphery nations. Thus, we would expect that people who live in nations on the periphery of the world system experience greater levels of crime victimization, including household property crimes. A few scholars (Fajnzylber, Lederman, & Loayza, 1998; Reza, Mercy, & Krug, 2001) present evidence indicating that periphery countries have higher official crime rates than do core countries. Thus the third question explored in this study: *Does the position of a nation in the world system (as a core or periphery nation) predict household property crime victimization among citizens of that nation?*

Inequality within Nations and International Variations in Crime

Marxist theory also argues that as capitalism becomes more dominant and expands it disrupts traditional production relations and causes greater inequality within countries affected by this disruption. The capitalist system forces people to compete for employment and scarce resources. This competition creates conflict and tension among various layers of the community. The ensuing social inequalities and poor living conditions produce strain and higher crime victimization rates (Greenberg, 1981). Thus, we expect that nations with greater levels of internal inequality have greater crime victimization among their citizens. Research using official crime data finds significant positive associations between crime rates and the levels of inequality (Fajnzylber, Lederman, & Loayza, 1998; LaFree, 1999), as did one study using international victimization data (Neapolitan, 2003). Thus the fourth question explored in this study: *Does the level of inequality of a nation predict the level of household property crime victimization among citizens of that nation?*

Routine Activities, Lifestyles, and Crime Victimization

Some individuals are more likely to be victims of crime because of the patterns of their everyday activities, which are related to their lifestyles. These patterns differ by individual demographic characteristics, including age, gender, marital status, education and income. Cohen and Felson (1979) developed routine activities theory to explain variations in crime victimization, arguing that criminal victimization is more likely to occur when motivated offenders encounter attractive targets in the absence of capable guardians who might intervene to stop a crime. Hindelang, Gottfredson and Garofalo (1978) argue that individuals with particular demographic characteristics are more likely to follow lifestyles and engage in activities that make their household property (and themselves) more

vulnerable to criminal victimization. (Criminologists often treat the two theories as synonymous, combining them under the label “routine activities/lifestyle theory” [Barkan, 2009]). Demographic characteristics are related to structural constraints and role expectations that shape individuals’ lifestyles, which greatly determine their routine activities. Thus people with certain demographic characteristics, notably young, unmarried, lower-income, less educated males, are more likely to be criminally victimized because structural constraints and role expectations situate them and their property in times and places in which capable guardians are absent and motivated offenders are present. For example, lifestyles related to household property crime victimization are those that draw individuals away from home during times of day or night that make their vehicles and property within their unguarded homes and vehicles more vulnerable. Income levels may make the property more valuable, but may also place it in an area that has fewer motivated offenders and more capable guardians. Felson (2002) offers evidence in support of routine activities theory and relates the longer hours in which houses are vacant in the United States to rising property crimes during the post-World War II period.

With some exceptions (Bennett, 1991a; Soares, 2002), most studies on demographic characteristics and crime victimization have been conducted in the United States. These studies tend to show that younger, male, unmarried, less educated, and poorer citizens are more likely to be victims of crime (Birbeck & LaFree, 1993; Felson, 2002; Parker et al., 1991; Smith & Hill, 1991; Smith & Jarjoura, 1989; U.S. Bureau of Justice Statistics, 2007; Weinrath & Gartrell, 1996). In a cross-national study, Soares (2002) finds that higher education levels are associated with lower crime rates. The scholarly literature presents some contradictory evidence related to income and crime victimization. Some researchers find that household property crime increases as the household income increases (Cohen, Kluegel & Land, 1981; Hindelang, 1976; Miethe, Stafford & Long, 1987; Reppetto, 1974). It is possible that people with a higher income status become more attractive targets (Lynch 1987), and thus have higher risks for household property crime victimization (Miethe & Meier 1994; Van Dijk, Mayhew, & Killias 1991). One study (Cohen & Cantor, 1981) found that the lowest *and* highest income groups are most at risk for property crimes. Other literature suggests that low-income groups are more likely to experience crime victimization in general than are high-income groups (Nilsson & Estrada, 2003; Pantazis, 2000; Thacher, 2004). Given the previous research, which presents somewhat mixed results related to property crime, it is clear that the relationship between demographic characteristics and household property crime needs to be explored with victimization data. Thus the fifth question explored in this study: *Are individual characteristics of age, gender, marital status, education, and income related, in an international sample, to variations in household property crime victimization, as suggested by routine activities/lifestyle theory?*

Data, Sample, and Measurement of Variables

Because nearly all the previous research on international differences in crime rates use official data (Neapolitan [2003] and Uludag, Colvin, Hussey and Eng [2009] are exceptions), we need to explore these relationships with self-reported victimization data. In addition, because our variables are both individual level and country level, we need to employ a multilevel analysis. Drawing on previous research and theoretical expectations

discussed above, we explore the research questions stated in the previous paragraphs in the following analysis.

Data and Sample

The data for this study are from the International Crime Victimization Survey (ICVS) conducted in 2000 (ICVS International Working Group, 2003). The dataset consists of two components: national survey data and city survey data. Some of the surveys were administered nationally and some were restricted to the main city within a given country. The ICVS National Survey Data cover the following countries: Australia, Belgium, Canada, Catalonia, Denmark, England and Wales, Finland, France, Netherlands, Northern Ireland, Portugal, Scotland, Sweden, Switzerland, and the United States. The ICVS City Survey Data cover the following countries: Albania, Azerbaijan, Belarus, Botswana, Bulgaria, Colombia, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lesotho, Lithuania, Mongolia, Namibia, Panama, Philippines, Poland, Republic of Korea, Romania, Russia, South Africa, Swaziland, Uganda, Ukraine, and Zambia. For each dataset, samples of 1,000 to 2,000 cases were drawn from the population of each country or main city. Both components (national and city data) are combined into one dataset in the current study. (Our multilevel analysis, which controls for unmeasured random effects, takes into account the varying geographic contexts of the samples.) The survey data for the current study were collected in 2000, in which respondents reported on crime victimization during 1999. The survey questions focus mainly on whether and how frequently respondents were victims of specific crimes. Among the crimes are burglary, theft from vehicle, and stolen vehicle, which we define as household property crime. The survey measures the *occurrence of victimization* (whether an individual was or was not a victim) and measures the *intensity of victimization* (if victimized the number of times victimization occurred during 1999).

One of the biggest problems of cross-national and comparative studies is the variance in definitions of crimes in legal codes and differences in rates of reporting crime incidents to authorities among nation states (Reichel, 2002). Although it may contain the general weaknesses of survey data and problems with translation into many languages among the 42 nations surveyed, the ICVS nonetheless addresses the problems of using official data by relying on self-reports of victimization with a standardized set of survey items, including standard victimization definitions.

Although international victimization surveys such as the ICVS promote cross-national and comparative studies, they have weaknesses (Neapolitan, 1997, 2003). First, data collecting procedures are not identical for each country. A computer assisted telephone interview is used in some countries (mainly in the Western nations) whereas face-to-face interviews are used in other countries, which may affect response rates and estimations of criminal victimization (Cantor & Lynch, 2000). Second, differences in response rates among the nations may cause possible measurement errors, though a previous analysis of ICVS data found no systematic associations between response rates and victimization rates (Van Dijk & Mayhew, 1993). Third, although the questions used to measure crime victimization are identical across nations, cross-cultural differences in interpreting the meaning of crime incidents may emerge as a potential problem in cross-national studies (Neapolitan, 1997). Fourth, crime victimizations are rare events. Regarding this, a small amount of reporting error for a particular type of crime may create a large effect on overall crime victimization. In the current study, crime victimizations with similar characteristics

are grouped under a single category (household property crimes) so that a much larger sample size of those victimized is provided to minimize the effect of possible sampling errors on crime victimization rates.

The unit of analysis for the current study is individuals aged 16 and over living in 42 countries included in the ICVS. The total sample size is 72,367 respondents. However, due to missing data, the analysis includes 31,019 cases that were usable for predicting household property crime victimization. The number of missing cases is a limitation of the study because it may introduce sample selection bias, but this is somewhat compensated because of the large sample size.

Dependent variables

The dependent variable is “Household Property Crime Victimization.” Although 1,000 to 2,000 cases were drawn from each country, some countries have proportionately larger samples of their population than do others. To reduce possible measurement error due to unequal sample sizes, we standardize individuals’ reports of household property crime victimizations by dividing these individual observations by the square root of the sample sizes of each respondent’s nation.

The dependent variable, household property crime victimization, is a count variable. To measure crime victimization the following question was asked: “How often did it (burglary, etc.) happen in 1999?” Household property crimes include burglary, theft from vehicle, and vehicle theft. The key difference between personal crime (which includes pick pocketing, robbery, assaults, and sex offenses, and was used as the dependent variable in the study by Uludag, Colvin, Hussey and Eng [2009]) and household property crime is that in the former there is contact between the offender and victim while in the latter there usually is not.

Independent variables

Key elements of the research questions that guide this study include the following variables: Level of democracy, economic development, world system status, inequality within nations, and demographic characteristics related to lifestyles and routine activities.

Level of Democracy as an Indicator of Modernization

A level of democracy score (measuring the political aspect of modernization) is computed for each nation from the average of the political rights score and the civil liberties score developed by Freedom House (1998). Freedom House scores are the most frequently employed, and appear to have the best validity of any indicator of democracy level (McClintock & Lebovic, 2006). The Freedom House survey includes two main components: analytical reports and numerical ratings for 192 countries. Since 1972, Freedom House has rated each country for civil liberties and political rights. The current study uses Freedom House democracy ratings for the year 1998 to provide a time lag between independent and dependent variable (household property crime victimization is measured in 1999). The political rights and civil liberties indicators consist, respectively, of 8 and 14 checklist questions (see Freedom House, 2002, for details). Those indicators are grouped, for *political rights*, by questions dealing with electoral process, political pluralism and participation, functioning government, additional discretionary political rights; and, for *civil liberties*, by questions dealing with freedom of expression and belief,

associational and organizational rights, rule of law, personal autonomy and individual rights. Each question under these categories is assigned a specific score for each country, which is the basis for the two composite scores (one for political rights and one for civil liberties) reported by Freedom House for each country.

While by no means perfect, one of the advantages of Freedom House democracy scores is that it measures the realization of actual rights and liberties rather than just checking if these exist merely on paper in the legal structure of a specific country. Freedom House also considers the situation of minorities, immigrants and women when determining democracy scores of each nation state. The Freedom House Index also includes non-election aspects of democracy (Munck & Verkuilen, 2002).

Although it is the most preferred democracy index among the alternatives, Freedom House scores are not free from criticism. The most severe criticism is that Freedom House does not provide access for researchers to the raw data and to the formal coding and aggregation rules (Munck & Verkuilen, 2002). Other criticisms are that Freedom House determines democracy scores by evaluating the analytical reports and numerical ratings of analysts/writers and 13 senior-level academic advisors. Therefore, a risk of subjectivity and possible distortion may emerge.

Alternative democracy indexes have even greater weaknesses. The Polity IV index, does not include non-election aspects of the democracy (Marshall & Jaggers, 2002; Munck & Verkuilen, 2002). Vanhanen's (2000) democracy index is based on only two indicators, competition and participation. Arat's (1991) democracy measure takes into account only features of electoral processes. Other democracy scores also use narrow indicators limited to electoral dimensions (Munck & Verkuilen, 2002).

Given the limitations of these other indexes, the Freedom House Democracy Index appears to be the most empirical, conceptually comprehensive, and reliable indicator. As a validity check, correlation analysis (of 42 countries we study) reveals that the Freedom House scores correlate reasonably with other democracy indices ($r = .55$ with Vanhanen scores and $.86$ with Polity IV scores).

Freedom House assigns each nation a score (from 1 to 7) for political rights and a score (from 1 to 7) for civil liberties in which one represents the highest level of democracy and seven the lowest level of democracy. For our analysis, we add the two scores together and divide the sum by two. We then reverse code this democracy score so that 7 represent the highest level of democracy and 1 the lowest. Each nation's democracy score, derived from Freedom House for 1998, is assigned to individuals included in that nation's sample who report on their crime victimizations.

Economic Development as an Indicator of Modernization

Modernization theory assumes that international variations in crime rates are the product of differences in economic development (Shelley, 1981). To measure the economic development level of each nation, we use GDP per capita, which is an indicator of aggregate economic output (Human Development Report, 2000). Each nation's GDP per capita in 1998 is assigned to individuals included in that nation's sample who report on their household property crime victimizations.

An important reason to adopt GDP per capita as a measure of economic development is that it is widely used in international comparative studies of crime (Krahn, Hartnagel & Gartrell, 1986; LaFree & Kick, 1986; Messner & Rosenfeld, 1997; Neapolitan, 2003; Rushton & Whitney, 2002; Shelley, 1981; Uludag, Colvin, Hussey & Eng, 2009),

allowing our results to be compared to previous research. However, there are drawbacks to using GDP per capita. GDP per capita comparisons may distort actual purchasing power differences among nations because the indicator uses a standardized currency (the dollar) calculated from exchange rates rather than calculating actual costs for goods and services based on the particular currency of each nation (Kravis, Heston & Summers, 1978). Another shortcoming is that GDP per capita ignores economic output from underground economies and from non-market activities, such as homemaker services (McConnell & Brue, 2006). GDP per capita is an uncertain indicator of overall wellbeing of a nation (Wesselink, Bakkes, Best, Hinterberger & Brink, 2007). Since it is an aggregate measure, a high GDP may coincide with high levels of inequality. A rapid level of growth in GDP may mask environmental devastation, which can undermine economic health, public health, and sustainability. Thus, GDP per capita as a measure of aggregate economic output may not fully capture the meaning of modernization, especially its assumptions about the positive aspects of development.

World System Status: Inequality between Core and Periphery Nations

Drawing on World System Theory, we use the status of a country in the world system as another explanatory variable to predict personal crime victimization. The status of a country, whether it is core or periphery, is determined with an index developed by Edward L. Kick (1987), who studied trading, military, and other dependency networks among blocks of nations to determine his categories. Kick (1987) categorizes 130 nations in terms of their position in the world system. However, some countries (especially in Eastern Europe and the former Soviet Union) emerged after Kick's 1987 classifications; these countries are assigned to core/periphery categories based on their GDP per capita and their economic freedom scores, which are retrieved from the Economic Freedom of the World: 1998 Annual Report released by The Fraser Institute (1999). For the current study we combine Kick's (1987) four categories: core, semi-core, semi-periphery and periphery into two categories: "core" and "semi-core" are coded as 0 and "semi-periphery" and "periphery" are coded 1 so that a dummy variable measures the position of a country in the world system as either core or periphery. In the current study, 60 percent are categorized as "core nations," and 40 percent as "periphery nations."

Inequality within Nations

Marxist theory also suggests that differences among nations in levels of inequality predict variations in crime victimization. We use the GINI index to measure inequality of income and consumption within each nation. The GINI coefficient is expressed as a percentage (the GINI coefficient multiplied by 100). A value of 0 represents perfect equality, a value of 100 represents complete inequality. The United Nations Development Project, which collects data for the GINI coefficient, discusses differences among nations in methods for generating these data and in their quality; these data should therefore be used with caution (Human Development Report, 2001).

Demographic Variables Related to Routine Activities and Lifestyle

Routine activities/lifestyle theory and previous research suggest that individuals' gender, marital status, income, education and age are related to crime victimization. We thus measure the following variables: gender (female = 1; male = 0), marital status

(married = 1; single, divorced, widowed, etc. = 0), income (broken into four categories from lowest 25% = 1 to highest 25% = 4), education (coded as actual years completed), and age (broken into 12 categories between ages 16 and 70+ with 16-19 = 1 and 70+ = 12). These demographic variables represent indirect indicators of routine activities and lifestyle. Research reported earlier links these demographic variables to variations in routine activities and lifestyles.

Methodology and Analytic Strategy

The methodology employs a cross-sectional study of individuals surveyed in 42 nations in 2000 and asked about crime victimization experiences in 1999. Some independent variables (democracy level, GDP per capita, world system status, and GINI inequality index) are scored one year earlier (1998) than the values for the dependent variable to incorporate a time lag into the analysis. VIF test shows that none of the nine independent variables suffers from multicollinearity ($vif < 4.00$ with the highest VIF value for any independent variable at 2.34).

A previous study (Neapolitan, 2003) using ICVS data, which looked at the effects of national-level variables, aggregated the individual reports of victimization for each nation (measured by percentage of respondents victimized in each nation), thus treating each individual nation as a case. In the current study, we treat each individual respondent as a case and include both individual-level and national-level variables, thus requiring a multilevel analysis. In order to account for the effect of individuals nested within each of the 42 countries, a two-level hierarchical linear model (HLM) is appropriate. HLM is designed for use with a normally distributed continuous outcome variable (Raudenbush & Bryk, 2002). However, the dependent variable in the current study is an over-dispersed count variable with excess zero values, which violates the assumption of a normal distribution. Thus, the appropriate model for these data is a zero-inflated negative binomial (ZINB) regression model that includes random effects (DeMaris, 2004; Littell, Milliken, Stroup, Wolfinger & Schabenberger, 2006; Raudenbush & Bryk, 2002; Tooze, Grunwald & Jones, 2002). PROC NL MIXED in SAS is used for this analysis (Littell, et al., 2006). The Vuong test statistic determines the need for a zero-inflated model. The statistic compares the negative binomial regression model to the ZINB. The ZINB is the preferred model if V is greater than 1.96 (DeMaris, 2004). The test was significant for the household property crime victimization dependent variable ($V=18.52$), meaning it is important to take the zero-inflation into account.

A zero-inflated ZINB regression model consists of two models. The first model predicts membership in the zero population, which did not experience any household property crime victimization during 1999 (occurrence). The second model uses the Negative Binomial model to predict the amount of household property crime for the population that did experience this type of crime victimization during 1999 (intensity). The same predictors should be used in both models (DeMaris, 2004). In a ZINB with random effects, the random effects can occur in both the occurrence and intensity models (Tooze, Grunwald & Jones, 2002). The random effects account for some countries having higher or lower probability of people experiencing zero crime victimization and some countries having a higher or lower amount of victimization for people who have experienced crime victimization (the at risk population). These random effects can be correlated, meaning countries with a high likelihood of crime victimization may have higher or lower mean victimizations experienced by the at risk population. Because this

seems likely, we allow the random effects to be correlated in the analysis. The result is zero-inflated negative binomial regression (ZINB) with correlated random effects.

Results

ZINB regression with correlated random effects was fitted to the data using PROC NLMIXED in SAS. Table 1 contains the results.

Table 1. Results for Household Property Crime Victimization (Zero-Inflated Negative Binomial Regression with Correlated Random Effects)

Parameter	b	S.E.	t Value	Pr > t
Logit Results (Occurrence – predicting no crime)				
Intercept	1.51	1.49	1.02	0.3173
Democracy Score	0.04	0.18	0.19	0.847
GDP per capita	-0.01	0.05	-0.26	0.7942
World Sys. Status (periphery)	-1.82	0.73	-2.5	0.0178*
Inequality	0.02	0.02	1.04	0.3075
Married	0.09	0.04	2.09	0.0447*
Education	-0.03	0.01	-4.41	0.0001***
Income	-0.05	0.02	-2.26	0.0305*
Female	0.09	0.04	2.28	0.0293*
Age	0.05	0.01	6.75	<.0001***
s ₁ ²	1.28	0.54	2.36	0.0247*
Negative Binomial Results (Intensity)				
Intercept	2.85	1.90	1.5	0.1436
Democracy Score	-0.01	0.25	-0.04	0.9668
GDP per capita	-0.14	0.06	-2.28	0.0295*
World Sys. Status (periphery)	-3.13	0.87	-3.58	0.0011**
Inequality	0.03	0.03	1.03	0.3128
Married	-0.06	0.03	-2.09	0.0451*
Education	0.01	0.00	1.78	0.085
Income	-0.01	0.01	-0.74	0.4633
Female	0.02	0.03	0.74	0.4646
Age	0.00	0.01	-0.69	0.4943
s ₂ ²	2.51	0.77	3.25	0.0027**
rs ₁ s ₂	1.65	0.60	2.74	0.0099**
a (alpha)	0.36	0.02	18.43	<.0001***
-2 log likelihood	36805			
N	31,019			

* p < .05 ** p < .01 *** p < .001

The first section of Table 1 shows the results for the *occurrence* part of the model, which predicts individuals with no risk of (or zero) household property crime victimizations. The next part of the model provides the *intensity* results, which shows the factors that predict the number of victimization incidents experienced by individuals who report any household property crime victimization. The significant alpha coefficient (α) at the bottom of the table indicates there is significant over-dispersion in the data.

In Table 1, the World System Status variable shows that individuals in periphery nations are more likely to experience at least one incident of household property crime victimization (to be non-zero *occurrence*) than individuals in core nations (who are more likely to have zero *occurrence*). However, those who are victims of household crime in periphery nations experience lower levels of victimization (less intensity) than individuals in core nations who experience household property crime.

While the level of economic development (GDP per capita) does not predict occurrence of household property crime victimization, it does predict intensity of household property crime victimization for those who have been victims. Individuals at risk for household property crime who live in countries with lower GDP per capita experience more household property crime than individuals at risk for household property crime who live in countries with higher GDP per capita.

Of the demographic variables, married people were less likely to experience household property crime (greater zero occurrence), and when they did experience it, they experienced it less frequently (lower intensity) than people who were not married. Other demographic variables also influenced *occurrence* of household property crime victimization: People with higher education, people with higher incomes, males, and younger people were more likely to experience at least one household property crime. (None of these demographic variables, however, predicts *intensity* of household property crime victimization.)

The random effects variance for occurrence (s_1^2) and intensity (s_2^2) are both significant. This means that even after accounting for the differences among countries in democracy level, GDP per capita, world system status, and inequality, some countries have a greater likelihood of their citizens experiencing household property crime, and some countries have higher or lower amounts of household property crime when this type of crime is experienced. The significant correlation between the random effects (rs_1s_2) shows that after controlling for the other variables, countries with a greater likelihood of household property crime victimization (occurrence) also report more household property crime victimization per person (intensity).

In summary, the following was found for each independent variable. (Recall that the occurrence part of the analysis predicts chances of zero victimization, so that a positive relationship indicates not having been a victim and a negative sign indicates having been a victim. The intensity part of the analysis predicts the number of victimizations for those who are victims, thus positive relationships in this part of the analysis indicate greater victimization levels.) Democracy level predicts neither the occurrence nor the intensity of victimization. GDP per capita does not predict the occurrence of victimization, but does predict its intensity with individuals who are victims in less developed nations having greater numbers of victimizations. World system status predicts both the occurrence of victimization (more likely in periphery nations) and intensity of victimization (greater in core nations). Inequality level within each nation predicts neither the occurrence nor the intensity of victimization. Marriage predicts both the occurrence and intensity of

victimization with married people less likely to be victims and if victimized to have lower numbers of victimizations than non-married people. Education predicts occurrence (higher educated individuals more likely to be victims) but does not predict intensity of victimization. Income predicts occurrence (higher income individuals more likely to be victims) but does not predict intensity of victimization. Gender predicts the occurrence but not the intensity of victimization with males more likely to be victims than females. Age also predicts occurrence but not the intensity of victimization with younger people being more likely to report being victims. In the next section, we discuss these findings in greater detail.

Discussion

Five sets of research questions guided this study. We discuss each of these research questions in light of the findings of the multilevel analysis.

Does the level of a nation's democracy predict the level of household property crime victimization for citizens of that nation? While previous research using official data suggests that countries with higher levels of democracy have lower levels of crime, the current study using self-reported crime victimization data indicates that the level of a nation's democracy does not predict either the occurrence or intensity of household property crime. If the underlying assumptions connecting democracy to modernization and the civilizing process are true, these nonetheless do not appear to be reflected in differences in crime victimization.

Does the level of a nation's economic development predict the level of household property crime victimization among citizens of that nation? Several studies using official data found significant inverse relationships between GDP per capita and crime rates (whether measured as occurrence or as intensity) (Krahn, Hartnagel & Gartrell, 1986; LaFree & Drass, 2002; LaFree & Kick, 1986; Messner & Rosenfeld, 1997; Montinola & Jackman, 2002; Rushton & Whitney, 2002; Sung, 2004). Other studies found no relationship (Bennett 1991b; Johnson, 1995; Neapolitan, 2003; Pampel & Gartner 1995). Still other studies suggest differential effects of development on crime rates depending on the type of crime, with property crimes being higher relative to violent crimes in more developed countries (Bennett, 1991a; Heiland and Shelly, 1992; Kick & LaFree, 1985; LaFree & Kick, 1986; Messner, 1986; Neapolitan, 1997; Shelly, 1981). The current study using self-reported crime victimization data provides mixed results, showing differences related to intensity but not to occurrence. The only significant finding for the development variable is an inverse relationship between GDP per capita and *intensity* of household property crime victimization. For persons who were victims of household property crimes, those living in nations with lower GDP per capita report a higher number of household crime victimizations than those living in nations with higher GDP per capita. These findings appear contrary to some previous studies, which found higher property crime rates in more developed countries. Our findings provide only partial support to previous studies that use official data, some of which found an inverse relationship between economic development and official crime rates. Our findings indicate an inverse relationship between GDP per capita and intensity of household property crime. To the extent that GDP per capita may represent levels of modernization, modernization, at least as indicated by level of economic development, appears to be inversely related to the intensity (but not occurrence) of household property crime.

Does the position of a nation in the world system (as a core or periphery nation) predict household property crime victimization among citizens of that nation? While a couple studies provided evidence that periphery countries have higher official crime rates than do core countries, the question remained largely unexplored, especially with self-reported victimization surveys. The current study indicates that world system status is predictive of household property crime victimization. Individuals in periphery nations are more likely to experience household crime victimization (occurrence); however, those who are victims of these crimes in periphery nations report a lower number of victimizations (less intensity) than individuals in core nations who are victimized by household crime. Thus, our findings offer a complex picture of the relation between world system status and household property crimes. As periphery nations are exploited by core nations, and become impoverished as a result, this leads to growing numbers of economically desperate people. From this group are drawn motivated offenders who victimize more households (thus greater occurrence). However, it appears that once these households in periphery nations are victimized, they are less likely (compared to those in core countries) to be victimized again (thus less intensity in peripheral nations). There may be several reasons for these findings. Once someone is victimized by household property crime in a periphery nation, they may not be as attractive a target (given the overall greater poverty), or the household may take greater steps to protect their property after an initial victimization. In core countries, there may be a higher initial level of property protection plus a lower level of economically desperate people motivated to offend (thus lower occurrence); but once a household is victimized in a core country, it may be seen as a continually attractive target, leading to more attempts at its victimization (thus higher intensity of household property crime in core nations).

Does the level of inequality of a nation predict the level of household property crime victimization among citizens of that nation? Previous studies using official crime data show that nations' levels of inequality (GINI coefficients) are positively associated with nations' official crime rates (Fajnzylber, Lederman & Loayza, 1998; LaFree, 1999). Neapolitan (2003), using ICVS victimization data, also found the GINI coefficient predictive of crime victimization, which he measured in the aggregate (percentage of respondents victimized) for each nation. The current study, which uses self-reported crime victimization of individuals, does not show any significant relationship between the GINI coefficient and household property crime victimization. Inequality may possibly have differential effects in nations depending on levels of economic development or position in the world system. However, introducing interaction terms in the current analysis made the model overly complicated and it would not converge. Thus, interactions could not be included in the analysis. However, because unmeasured random effects were significant in the current study, interaction effects (such as Inequality X GDP per capita) cannot be ruled out for future research.

Are individual characteristics of age, gender, marital status, education, and income related, in an international sample, to variations in household property crime victimization, as suggested by routine activities/lifestyle theory? Many of the significant results of this study come from the group of demographic variables related by both theory and research to differences in routine activities and lifestyle. The strongest and most consistent protective factor against crime victimization is marriage. Married respondents had a lower occurrence and intensity of household property crime victimization. Age also showed significant effects. Younger people were more likely to experience household property crime victimization

(occurrence) but, if victimized, they experienced these victimizations no more frequently than did older people. People with more education were more likely to experience household property crime victimization (occurrence) but, if victimized, they experienced these victimizations no more frequently than did those with less education. Income affected only the occurrence (but not the intensity) of household property crime victimization; people with higher income were more likely to be victims. Finally, gender affected only the occurrence (but not the intensity) of household property crime victimization, with males more likely to be victims than females.

The results of these demographic variables on the whole support routine activities/lifestyle theory. The findings concerning marriage are completely consistent with routine activities/lifestyle theory, which suggests that married people are less vulnerable to crime victimization, both in terms of occurrence and intensity. The findings related to education and income can be explained from routine activities theory by the greater attractiveness these individuals' property offer as crime targets. The findings related to age and gender are supported by previous research which indicates that females and older people are less likely to be crime victims, which is consistent with routine activities/lifestyle theory. However, the gender and age differences emerge for only the occurrence of household property crime, not for the intensity of these victimizations, which is not entirely consistent with routine activities theory. People of all ages and both genders who are victims (occurrence) do not differ in their numbers of victimizations (intensity). If a female or an older person becomes a victim, they are just as likely to suffer a similar number of victimizations as a male or a younger person who has been victimized. It is possible that among victims those who are of different age groups or genders tend to share similar lifestyles or routine activities that make them just as vulnerable to further victimizations.

Conclusion

This international crime victimization study found that some national-level variables (GPD per capita and world system status) affect household property crime victimization while others do not (democracy level and inequality level). All of the individual-level variables related to routine activities/lifestyle theory showed at least some effects on household property crime victimization.

Our study highlights the importance of the type of multilevel analysis used in this study. Multilevel analysis nests individual respondents within their national contexts and controls for unmeasured variables that affect cross-national variations in crime victimization. Because crime victimization data are skewed with a large segment of the population reporting zero victimization, the appropriate analysis is the zero-inflated negative binomial (ZINB) regression with correlated random effects. Future research that uses international crime victimization data and includes both individual and national level variables needs to utilize similar multilevel analyses.

Considerable limitations of the current study need to be addressed in future research. For example, our designation of household property crime does not measure all types of property crime. Some crimes involving personal theft, such as pick pocketing or robbery (which involve direct contact between offender and victim), are excluded in the current study due to the ambiguous nature of these as both personal and property crimes.

Our measures of some theoretical concepts may only imperfectly capture these theories' concepts. For instance, demographic characteristics as proxies for routine activities/lifestyles are at best indirect measures of these concepts. A more direct test of routine activities/lifestyle theory would include variables that directly measure individuals' time away from home, locations of houses and vehicles relative to presence of capable guardians and to their attractiveness as crime targets. We were limited in the current analysis to the indirect demographic correlates of routine activities and lifestyles.

Other limitations, which were discussed in the data and sample section, accrue from the nature of the data set and sampling. Variable response rates among nations are a limitation, as is the fact that some nations' samples are drawn from the main city and others are drawn from the entire nation. These limitations produce some countries with more urbanized samples than other countries, which can affect the national reporting of victimization. The standardization of victimization responses and the multilevel analysis controlling for random effects help adjust for or take into account these sampling differences among the 42 nations, but they remain a limitation. We also have the inherent problems with self-reported victimization surveys, including accuracy of memory, honesty of reporting, use of different interview methods in different nations (telephone vs. face-to-face), and interpretations of events as criminal or not, which is complicated by differences in cross-national meanings of crime.

The current study was exploratory. We wanted to ascertain if results from victimization surveys of single countries and results from cross-national studies using official crime rates could be replicated in a cross-national crime victimization survey using a multilevel analysis. We found some areas of agreement with previous studies. However, we also produced findings that contrast with previous research and theoretical expectations. Findings of victimization surveys often diverge from official data. In addition, results of multilevel analyses also frequently differ from those of single-level analyses. We believe that victimization studies using multilevel analysis will be essential for cross-national crime studies in the future. Given the significance of unmeasured random effects, future research needs to explore other variables that were not included in the current study, including interaction effects that could not be included in the analysis.

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