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LINKING SOCIETAL AND PSYCHOLOGICAL FACTORS TO HOMICIDE RATES ACROSS NATIONS

FLORA LIM
MICHAEL HARRIS BOND
Chinese University of Hong Kong
MIEKO KUCHAR BOND
University of Manchester

National rates of homicide vary dramatically and may provide a window into the societal dynamics and their socialized psychological reflections that generate violence. To develop a comprehensive theory of these dynamics, this study examined stable rates of homicide in 56 nations. A selection of societal-level variables was deployed in conjunction with psychological measures of citizen characteristics to predict homicide levels. Using blocked regression, and beginning with economic predictors, the authors discovered that homicide was most powerfully predicted by a linear equation combining societal measures of economic inequality, negative GNP per capita, and the negative sex ratio of men to women. Psychological measures of lower trust in one's fellow citizens, belief in less social complexity, and preference for mates of higher status as opposed to love also predicted national homicide rates and were able to mediate the effects of the three societal variables on these national homicide rates. This study exemplifies the potential usefulness of combining societal and psychological measures in understanding national phenomena, suggesting plausible personality or social psychological factors characterizing a nation's citizenry that are implicated in generating higher levels of any behavior, like homicide.

Keywords: homicide; societal factors, psychological factors

Murder, though it hath no tongue, will speak with most miraculous organ.

—Shakespeare, *Hamlet*

Homicide is a rare event. As such, it is difficult to study at the individual level. So, in attempting to understand its dynamics, social scientists have exploited the availability of national homicide rates provided by international agencies. These homicide rates have then been linked to other national indices of interest, usually economic, in an attempt to support theorizing about the societal factors involved in provoking homicidal behavior.

Research on homicide by criminologists usually derives from two commonly employed approaches: social disorganization theory and general strain theory. Social disorganization, as Bursik (1988) explains it, happens when the community can no longer maintain effective social control of its residents through sets of common values and fails to develop formal and informal ties to solve problems at a community level. Such deterioration of community

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solidarity is brought on by economic and social changes in the community, disrupting interpersonal ties and weakening social control, thereby releasing individuals to become violent in order to survive in a deteriorating environment.

A second line of literature focuses on economic stress and has led to the development of strain theory. Strain theorists focus on the direct effect of income and socioeconomic inequality on individuals' level of frustration (Agnew, 1999). High-crime communities are more likely to select and retain strained individuals, produce strain, and foster criminal responses to strain. These societies are often characterized as poor in terms of income, unemployment, welfare, occupation level, education, inequality, owner-occupied dwellings, and substandard housing. The strain such communities generate drives its members to antisocial behavior, including homicide.

To demonstrate the effect of economic strain on individuals at a national level, income inequality is the most commonly used variable in studies of homicide across political units, especially nations (LaFree, 1999). A positive relationship between the degree of income inequality and homicide is consistently found in such research. In their study of the influence of racial and income inequality on crime in American cities, for example, Blau and Blau (1982) demonstrated a direct effect of economic inequality on homicide rates. They argued that economic inequality makes society more vulnerable to violence if the inequality derives from a person's ascribed position in a society, like the United States, that advocates democracy and equality. The resulting higher levels of frustration, alienation, despair, and conflict in the populations of these societies will breed higher crime rates. It is possible that this logic applies equally in societies having a less egalitarian social agenda.

Indeed, many subsequent cross-national studies have also found a significant relationship between economic inequality and homicide (LaFree, 1999). According to Wilkinson (1996), greater income inequality in a nation, regardless of culture, leads to more invidious social comparisons being drawn by the poor and to greater social derogation by the rich of those who are less successful in the Darwinian economic jungle. A hypersensitivity to disrespect then develops in the poor, unbuffered by social interconnections across status lines. Increased frequency of homicidal response to the distress arising from perceived disrespect is the result in nations with more unequal distributions of wealth.

Wilkinson's (1996) theorizing about economic inequality has been supported in numerous studies involving different political units of various types, even when the overall wealth of those political units has been controlled (see Wilkinson, 1999, for a review). Subsequent work has attempted to validate Wilkinson's social-psychological theorizing by connecting measures of economic inequality to other social indicators consistent with his theorizing about the processes involved in generating homicide. So, for example, Wilkinson, Kawachi, and Kennedy (1998) argued that social interconnectedness among members of a social unit represents social capital that inhibits the expression of hostility within the unit just as it promotes cooperation (Fukuyama, 1995). They used a measure of interpersonal trust as a proxy measure of social capital (Putnam, 1995) across the 50 American states to assess the degree of social interconnectedness within the state. They found that there was lower social capital in states with higher economic inequality, a finding consistent with their theorizing about the dynamics of homicide.

Comparative studies on homicide like those above have been largely conducted by criminologists, using societal factors as predictors. Societal factors, however, need to be supplemented by psychological factors in understanding homicide. It is, after all, individuals who

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kill one another. Measures of their various individual processes need to be integrated into our investigations, so that theorizing about the social psychological dynamics of homicide may be tested empirically. Psychologists have looked extensively at the role of parental rejection (Deater-Deckard, Dodge, Bates, & Pettit, 1996), of emotions, especially anger (Rule & Nesdale, 1976; Tedeschi, 1999), and of personality dimensions, especially neuroticism (Caprara, Barbaranelli, & Zimbardo, 1996) and sociopathic personality disorder (Cooke, 1998), and at definitions of gender processes (Heimer & DeCoster, 1999), responsibility attributions for harmful behavior (Dodge & Somberg, 1987), and other factors in predicting aggression-related outcomes (see Bond, 2004, for a review).

During the past decades, cross-cultural psychologists have been mapping the average levels of some such potential mediators of aggression shown by citizens in many nations. Allik and McCrae (2004), for example, use data originally presented by McCrae (2002) to profile the typical citizens from 36 cultures across the Big Five personality dimensions of extroversion, agreeableness, conscientiousness, neuroticism, and openness to experience. These and other internal, psychological factors may now be linked to homicide levels, just as external, societal factors have previously been. Given that such cross-national studies of psychological constructs are only just beginning to appear, researchers will have to be opportunistic in their selection and guided by the available theory in linking these personal constructs to the societal predictors and outcomes in question.

When internal and external factors are combined in the same study, it will become possible to discover which psychological factors may be related to which societal factors in generating a particular societal outcome like homicide. So, for example, national differences in the level of social stress may predict homicide across nations, just as they predict homicide rates across states within a nation (Linsky, Bachman, & Straus, 1995). These researchers included a psychological measure of perceived stress in their analyses of state-wise homicide to discover if it mediated the effects of societal-level stress on homicide and other indices of social pathology. As they report, however, "the hypothesis that the effect of stressful life events is mediated by subjectively experienced stress was only weakly and inconsistently supported" (pp. 88-89). State-level stress could, however, operate through the agency of other, unmeasured social psychological processes, such as levels of interpersonal trust (Putnam, 1995), citizen emotionality (Tedeschi, 1999), or the perception of disrespect (Wilkinson, 1996) thought to drive aggression. As another example, Vandello and Cohen (2004) have argued that lethal domestic violence will be higher in cultures with traditions emphasizing male public reputation and female purity. In such cultural systems, men are motivated and supported in defending their honor against slights, including those from their spouses. Vandello and Cohen developed an index of "female purity" by combining societal measures of gender differences in smoking and drinking with the average age of brides and percentage of women in the country using contraception. Higher national scores on female purity were found to be associated with the prevalence of domestic violence. If their reasoning about the social psychological dynamics leading to wife abuse are correct, there should be associated social psychological-level phenomena also associated with both female purity and spousal abuse. Stereotypes about women relative to men (Williams & Best, 1982) and characteristics believed to guide mate selection (Buss et al., 1999) are two obvious candidates.

Measures of these individual-level processes aggregated to the national level can then be linked to national rates of homicide to determine whether the social psychological factors purported to drive the greater levels of homicide are in fact doing so. The assumptions

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underpinning this approach are, first, that there is a theoretical and empirically supported connection between the psychological characteristic and homicide or homicide-related behavior. Second, this characteristic is normally distributed across the society and those persons at the extreme end of the distribution are more likely to commit the observed homicide. Countries with citizens higher in their average levels of this psychological characteristic would therefore show higher levels of homicide, because more of its citizens would be functioning at the extreme ends of the nationwide distribution of the homicide-inducing characteristic.

In linking societal factors to these psychological factors, the animating assumption is that the societal condition operates through socialization agencies to inculcate higher levels of the homicide-related predisposition in its citizens. This is the presumption underlying social strain theories of criminal behavior, for example (Agnew, 1999), although this assumption cannot be scientifically assessed until a psychological disposition characterizing the population is empirically linked to both the societal condition and the homicide rate. Multiple regression techniques can be used to discover if the psychological factors tapped by the average score of a nation's citizens mediate the societal-level factors linked to homicide, as was attempted by Linsky et al. (1995) in their study of stress and homicide across the 50 states of the United States of America.

We use discrete, national-level indices in this search rather than composite, national-level indices. In their work on types of social pathology, Linsky et al. (1995) developed a composite index labeled "State Stress Index," made up of 15 separate state-level indicators, including divorce rate, infant deaths, unemployment, business failures, bankruptcy cases, mortgage foreclosures, and so forth. The problem with creating a composite out of such indices is that their discrete effects on the outcomes are blurred. Consequently, the social psychological mediators of these discrete effects cannot be determined. Possible separate avenues of psychological linkage between national-level variables and homicide can then not be teased apart. To effect this separation and thereby refine theory, we will treat national indices separately in exploring their role in national homicide levels.

This study thus combines societal indicators linked to homicide (Bond, 2004) with available psychological measures that can be plausibly linked to aggressive behavior. Our purpose is to ground theorizing about homicide arising from societal considerations in measured individual processes. These measures, called "citizen scores," are averages taken from equivalent samples of respondents in many nations and may be taken as a first approximation of the typical or average level of that process among a nation's citizens. Any theorizing about the psychological factors involved in a nation's homicide level should be consistent with the results of correlational analyses using these measures of the average level of individual constructs across national groupings. Should a psychological process be shown to mediate the linkage between societal-level factors and homicide, our confidence in the rationale for the effect of societal variation on behavior will be strengthened. Of course, citizen scores are population averages and therefore not individual scores. Thus, we are working at the national level of analysis. We propose, however, that results at this level of analysis may be used to suggest probable individual-level processes when the outcome in question, such as homicide or suicide, is so difficult to study at the individual level.

In this exercise, we are limited by the availability of cross-culturally equivalent and homicide-relevant psychological measures that have been gathered from citizens of large numbers of nations. One such study is the McCrae (2002) data on the Big Five personality dimensions in university students from 36 nations. Given Caprara et al.'s (1996) finding that

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various measures of aggression correlated more strongly with neuroticism than with the other four dimensions, we predict that nations whose citizens have higher scores in neuroticism would have higher homicide rates. We expect that neuroticism will mediate the societal effect of relative economic inequality on homicide because unequal economic conditions would enhance population neuroticism. Similarly, we expect that preferences for a spouse based on status rather than love (Shackelford, Schmidt, & Buss, 2004) reflect motivations arising in societies characterized by greater economic inequality. This mate preference should predict homicide and mediate the link between relative economic inequality and homicide. Given the oft-discussed link between emotional restraint and acting-out disorders, we predict that nations whose citizens have higher levels of emotional intensity, length, and recency (Wong & Bond, 2002) should likewise have higher homicide rates. Wealthier societies have more professionalized, service-oriented economies requiring greater socialization for emotional restraint. Higher national wealth in fact predicts lower levels on these emotional indices, so we expect these indices to mediate the established link between wealth and lower levels of homicide (LaFree, 1999).

Leung and Bond (2004) have recently integrated findings from their 40-nation survey of social axioms, identifying five dimensions along which citizens in these nations may be compared. Research on modes of conflict resolution (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004) has shown that higher levels of social cynicism beliefs predicted greater use of competitive strategies, lower levels of social complexity beliefs predicted lower levels of compromise and of collaboration, lower levels of religiosity predicted lower levels of accommodation, and lower levels of belief in reward for application predicted lower levels of compromise and collaboration. We thus predict that citizen scores on each of these four dimensions will predict homicide rates accordingly. Given the close association between national wealth and these belief scores across 40 nations (Leung & Bond, 2004), we expect that these four dimensions will mediate the linkage between lower national wealth and higher homicide.

Finally, trust between members of a polity reflects higher social cohesion or lower social disorganization and buffers the violence-inciting impulses arising out of difficult social interdependencies (Fukuyama, 1995). Consequently, we expect that societies characterized by higher citizen trust scores will have lower rates of homicide. Given the link between national wealth and social organization (Fukuyama, 1995) and between these societal features and interpersonal trust (Inglehart, 1997), we expect that trust will mediate the link between wealth and homicide that sometimes emerges from cross-national studies of homicide (LaFree, 1999).

METHOD

In this study, we first attempt to detect societal and citizen psychological factors correlated with national rates of homicide. All three types of variables assign a single score to a given country, so this is a nation-level study, despite the averaging of individual data from metrically equivalent psychological constructs to produce the citizen scores. Using regression analysis, we will then attempt to examine the mediating role of the psychological factors in linking societal factors to a nation's homicide rate.

Previous theoretical work has suggested and empirical research has established (see Bond, 2004, for a summary) that certain societal variables are prime candidates for such

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exploration. Economic inequality and the level of wealth have both been associated with homicide rates in past literature (e.g., LaFree, 1999), so in the regression analysis, these economic indicators will be put into the equation first. Other societal factors correlated with national homicide rate will then be added to the economic variables to determine if they add unique and additional variance in predicting homicide.

Many societal variables are highly intercorrelated and tap the same underlying societal construct (see, for example, Georgas, Van de Vijver, & Berry, 2004). So, for example, national wealth, employment rate, and human rights observance cluster together and probably reflect national "affluence." Although each may be theoretically implicated in homicide by different theories of homicide and separately related to homicide when tested, it is likely that they all relate to homicide through similar underlying mechanisms. To build comprehensive theories of any phenomenon, it is necessary to identify those variables that add predictive power to the outcome over and above those societal factors that intercorrelate and each predict the same outcome. So, we will correlate national homicide rate with a variety of societal variables that have been theoretically implicated in homicide, but focus our attention on those that add predictive power in explaining homicide.

Multinational data sets in psychology are rare but becoming more frequent. As this research is a nation-level study, the typical level of each psychological variable in each nation will be represented by an average across individuals of the relevant psychological variable (i.e., its citizen score). To this end, we will deploy those psychological constructs hypothesized in the introduction as relating to homicide, but require at least 20 pairs of national scores on homicide and the citizen variable to ensure a minimum level of statistical reliability.

These data sets have been collected at different time periods from one another, and from the homicide data used in this study. These temporal disjunctions raise questions about implied causality, viz., that the higher citizen score on the psychological characteristic causes the higher level of homicide in the nation. But, how could this conclusion be drawn if some of the data on citizen scores were collected after the data on homicide, viz., 1992 to 1996? Longitudinal, cross-national studies of citizen scores are rare, but the one published study of psychological and social-psychological variables across time periods showed high levels of temporal stability in citizen scores (Inglehart & Baker, 2000). Just as cultural characteristics change slowly, we may also assume that psychological characteristics of national populations deriving from these cultural characteristics likewise change slowly. Concerns about the temporal sequencing of societal and psychological characteristics can then be relaxed.

HOMICIDE RATES

The data were obtained from the World Health Statistical Annual (World Health Organization [WHO], 1992-1996). The data published included national averages of deaths by homicide for males and females per 100,000 persons in a particular nation. At present, the WHO homicide data are regarded as the most valid option for cross-national homicide study (LaFree, 1999).

To reduce the effect of yearly fluctuations, averages were computed for a multiyear period. Only those countries reporting a minimum of at least 3 years of homicide rates for the 5-year period from 1992 to 1996 were included in the analysis. The yearly rates a nation reported across those 5 years were averaged. Both male and female rates were calculated and these two rates were then averaged to yield a nation's homicide rate per 100,000 population.

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SOCIETAL VARIABLES

GNP per capita and average annual growth of GNP per capita. The World Bank publishes the World Development Report on an annual basis, providing indicators of economic and social development of nations around the world. GNP per capita for 1999 in U.S. dollars and GNP per capita average annual growth from year 1985 to 1995 on the year of 1999 were taken from its 1997 to 2001 report. Negative economic growth is a societal "strain" variable and may add its effect to the homicide rate.

GINI. The GINI coefficient is widely used to indicate the degree of inequality in a nation's income distribution. The country data calculated on the basis of gross household income were obtained from the World Income Inequality Database (WIID) produced by the World Institute for Development Economics Research in 2000 (version 1.0), published by the United Nations every year. The report provided a GINI index of the latest available year. The database contained income inequality data for 123 countries from the period of 1970 to 2000. The data were calculated on the basis of gross household income, and the data of the latest year were used in this study.

Total unemployment. The International Labour Office publishes the unemployment rate for males, females, and both sexes for persons aged 15 or older. Higher levels of unemployment represent greater societal strain, which is believed to foment homicide. The data are available online at the Web site of the Statistical Division of United Nations (2001), under the section of Social Indicators. The data are not published annually, and the year for the data obtained varied from 1991 to 1999.

Human rights observance. Humana (1992) has calculated how effectively governments protect their citizens' human rights as defined by the United Nations Covenant on Civil and Political Liberties. This score may be taken as a measure of a country's level of social capital (Wilkinson, personal communication) and as a proxy for levels of social trust (Fukuyama, 1995).

The sex ratio. The data on a nation's sex ratio were obtained online from the Web site of the Statistical Division of United Nations (2001), under the section "Social Indicators." The sex ratios indicated the number of males per 100 females of total population. This variable has been implicated in studies of homicide, although the results have been equivocal (Barber, 2000; Guttentag & Secord, 1983). It was included in this study as a possible control variable: Given that men kill at approximately four times the rate of females, we reasoned that it would be useful to control for the positive correlation between the sex ratio and national homicide rate before examining the relationships hypothesized.

Relative status of women. Vandello and Cohen (2004) have argued that the relative inequality of women with respect to men is a reflection of the social disposition to condone violence against women. It could also be construed as a reflection of hierarchical social organization and the concomitant legitimation of coercive tactics for interpersonal control, resulting in higher levels of homicide. The Population Crisis Committee (1988) reported the relative status of women in 99 countries based on five domains: health, marriage and children, education, employment, and social equality on a 100-point scale. A nation's total score across these five domains was used in this analysis. This may be taken as a broad measure of

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a nation's development of its social capital in that it reflects the degree to which women are involved in society's capital creation, beyond their universal role in socializing their children. This measure overlaps closely with the recent Gender Empowerment Measure available from the Human Development Report.

Divorce rate. A nation's divorce rate may be construed as an indicator of social dislocation and disorganization, long theorized to be a cause of social pathology including homicide (Durkheim, 1951) and a key variable in institutional anomie theory (Messner & Rosenfeld, 1997), a theory highlighting missing social controls deriving from weak, noneconomic institutions as a factor driving crime. The divorce data were obtained from the Human Development Report that reported data originally collected by the United Nations Economics Commission for Europe in 1996 to 1997, integrating data from the years 1992 to 1995 and providing a single rate for each country.

PSYCHOLOGICAL VARIABLES

Trust. The World Values Survey is "the largest investigation ever carried out of attitudes, values, and beliefs around the world. . . . It covers 65 countries on all six inhabited continents and contains more than 75 percent of the world's population" (Inglehart & Baker, 2000, p. 23). Among many other measures, this survey asks representative samples of national populations to report on their levels of trust toward members of their own nationality. Measures of trust are taken by using a 5-point Likert-type scale, ranging from 1 (*trust them completely*) to 5 (*do not trust them at all*; Inglehart, 1997). As this is a single-item measure, it is impossible to assess the cross-cultural, metric equivalence of the items making it up. In the absence of such a scale, however, the theoretical importance of the trust variable for homicide justifies our exploring its possible linkages in this study.

Social axioms. Leung and Bond (2004) have identified five dimensions of social belief that are similarly represented in samples from 40 national groups. Factor one was labeled "Social Cynicism" and represents a negative view of human nature, a biased view against some groups of people, and a mistrust of social institutions. The second factor was labeled "Social Complexity." Items in this factor maintain that there are no rigid rules but rather multiple ways of achieving a given outcome and that inconsistency in human behavior is common. The third factor was labeled "Reward for Application" and refers to a general belief that effort, knowledge, and careful planning will lead to positive results. The fourth factor was labeled "Religiosity." Its constituent items assert the existence of supernatural forces and the positive functions of religious belief. The fifth factor was labeled "Fate Control" and refers to a belief constellation that life events are predetermined and that there are some ways for people to influence these outcomes.

These five dimensions are included in metrically equivalent ways across the 40 national samples and hence may be used to make comparisons involving psychologically meaningful constructs across cultural groups. The average score of male and female undergraduates on these five dimensions of belief was used for analysis, and our focus will be on the first four factors, as indicated in the Introduction.

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NEO personality inventory. McCrae (2002) has provided data from 36 cultures on the Big Five measures of personality, viz., Extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience, taken from equivalent samples using the Revised NEO Personality Inventory. The average of male and female average scores was used to characterize these basic personality constructs in any given nation. Given Caprara et al.'s (1996) findings for aggressiveness, our focus will be on the personality dimension of neuroticism.

Emotionality. The ISEAR study (see Scherer & Wallbot, 1994) collected data on seven emotions, viz., joy, fear, anger, sadness, disgust, shame, and guilt, from persons in 37 countries, providing data for the two genders with a total respondent pool of 2,900. Each respondent was asked to report on aspects of their last experience of each of these seven emotions. We extracted three scores for each emotion: recency (i.e., the time when the emotion last happened); the length of that emotional experience; and the intensity of that emotional experience.

The same one-factor solution was found to characterize these three aspects of emotional experience across all seven of the emotions assessed in each of the 30 national groups assessed (Wong & Bond, 2002). For each of these 30 nations, we produced an average of the male and female averages for emotional recency, emotional length, and emotional intensity across all seven of the emotions.

Preference for different mate characteristics. Buss (1989) and his collaborators took ratings on the desirability of 18 characteristics of potential mates in 37 nations. The 18 items tapped various features like the financial prospects of the mate, his or her level of education, degree of mutual attraction, chastity, and so forth. These 18 items were recently subjected to a pancultural factor analysis (Bond, 1988), producing a four-factor solution following varimax rotation (Shackelford et al., 2004). As with social axioms, the NEO-PIR measure of the Big Five, and the three emotionality measures, these mate preference scores were derived from metrically equivalent ways of grouping items or facets into dimensions and so yield measures that can be psychologically compared across cultural groups.

Given its link to social inequality, the preference for love over status in potential mates is a prime candidate as a mediator of any inequality effect on homicide. This first factor contained four items, contrasting love against good financial prospects, favorable social status, ambition, and industriousness. The data provided a gender breakdown of the factor scores, so we used the average across the genders to represent the citizen score for assessing the strength of this, and the other three, constructs.

DESIGN

To understand the interrelationship among the various factors predicting national homicide rates, bivariate correlations will first be run on all variables. Then, blocked, multiple regressions of the significant correlates will be run to select the best set of societal variables predicting the homicide rate. Economic variables will be first put into the regression equation, and other societal variables significantly improving the prediction of homicide will be entered into the equation subsequently. Finally, blocked regressions will be run to identify those psychological variables that may be mediating, wholly or in part, the effects of the societal variables on the homicide rate.

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RESULTS

HOMICIDE DATA AND THE OUTLIER PROBLEM

Homicide data from the World Health Statistics Annual as well as the online database of World Health Organization—World Health Organization Information System (WHOSIS)—were collected. There were in total 56 countries that had reported homicide data for at least 3 years within the period of 1992 to 1995. The data from countries in Europe and the Americas were well represented, but there were only a few from Asia and none from Africa.

The average annual homicide rate per 100,000 citizens for all 56 countries was 7.86, with a standard deviation of 13.06. Figure 1 presents the total homicide rates of countries in an ascending order. The rates show an exponential trend. Colombia, the country with the highest homicide rate (84.67), is almost three times higher than the second highest country, Azerbaijan (30.93). Given this highly skewed distribution, a logarithmic transformation (to base 10) was applied to the data, so as to minimize the outlier effect of Colombia. The logarithmic transformed data will be used in both the correlational and the regression analyses reported below.

CORRELATIONAL ANALYSES

Consistent with findings from past studies, a number of economic factors related to homicide. Significant correlational relationships with total homicide rate were found for all four economic variables with total homicide rates: namely, GNP per capita, $r(5,349) = -.4068$, $p < .01$; and average annual growth of GNP per capita, $r(48) = -.32$, $p < .05$; GINI, $r(5,348) = .4457$, $p < .01$; and total unemployment, $r(51) = .37$, $p < .01$.

Noneconomic societal factors also demonstrated significant relationships with annual homicide rate, viz., human rights observance, $r(3,938) = -.3646$, $p < .0501$; unemployment rate, $r(51) = .32$, $p < .05$; percentage of GNP per capita spent on health, $r(46) = -.4038$, $p < .0501$; relative status of women, $r(3,543) = -.4337$, $p < .01025$; the sex ratio, $r(54) = -.38$, $p < .01$; growth competitiveness ranking, $r(46) = .68$, $p < .01$; current competitiveness ranking, $r(46) = .58$, $p < .01$; corruption perception index, $r(51) = -.65$, $p < .01$; average number of people, $r(31) = -.55$, $p < 01$; and total recorded crime per 100,000 population, $r(51) = -.46$, $p < 01$.

It was unexpected that the negative correlation between the sex ratio and homicide rate indicates that there was a higher homicide rate in nations with more, not fewer, females. Despite the greater frequency of homicide by males, there is less homicide in nations with relatively more males. Clearly, then, the sex ratio is not a control variable for correction purposes in our calculations but a substantive variable in its own right. We will therefore treat it as such in subsequent analyses.

Possible psychological mediators of these societal influences are those average citizen scores that also correlate with total homicide rates. There were 23 such psychological variables, but only 4 were significantly correlated with national homicide rate, viz., average score for citizen's endorsement of trust, $r(31) = -.45$, $p < .01$; fate control, $r(23) = -.43$, $p < .05$; average length of emotions, $r(20) = .43$, $p < .05$; and mate preference for love as opposed to status, $r(24) = -.54$, $p < .01$; and Factor 2 of mate preferences, $r(24) = -.47$, $p < .05$. At the same time, 3 other citizen variables demonstrated sizable correlations with homicide rate, viz., citizen neuroticism, $r(17) = .37$, citizen endorsement of fate control, $r(23) = .38$, and average length of emotions, $r(20) = .42$. As these correlations were not significant at the .05

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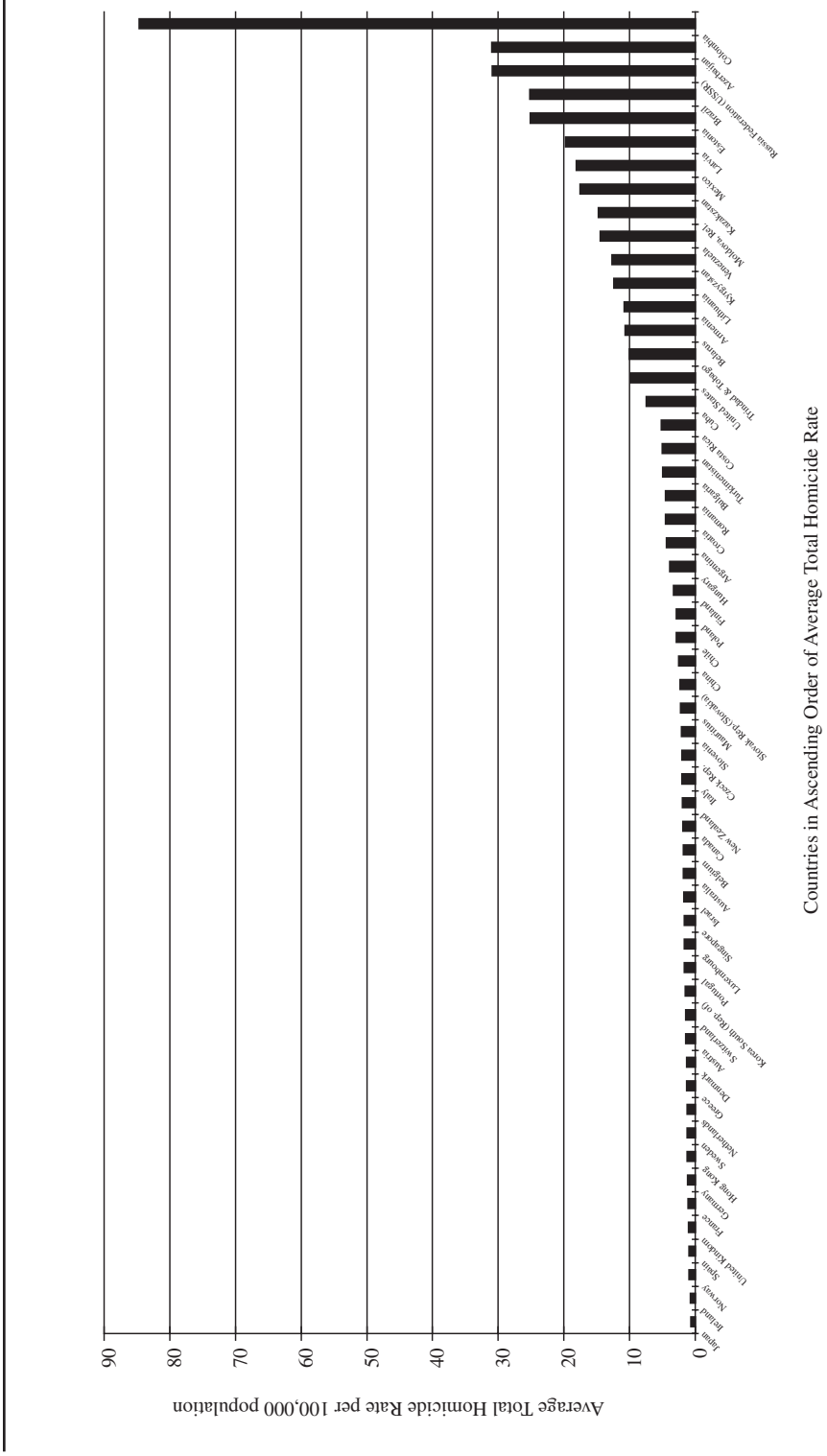

Figure 1: Average Total Homicide Rates of 56 Countries

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level, they will not be considered in this research as possible mediators for the societal effects on national rates of homicide. Their marginally significant status with respect to homicide is, nonetheless, suggestive; with data from greater numbers of nations available, they would probably have reached significance, so that their mediating role could have been assessed.

CORRELATIONAL ANALYSES EXCLUDING COLUMBIA

The next step was to run these correlational analyses without Columbia. For economic factors, significant correlational relationships were found for GNP per capita, $r(52) = –.51$, $p < .01$; average annual growth of GNP per capita, $r(47) = –.65$, $p < .01$; and GINI, $r(52) = .34$, $p < .05$.

There were differences found in noneconomic societal factors as well. Six out of 12 societal variables showed a significant relationship, viz., human rights, $r(38) = –.41$, $p < .05$; level of democracy, $r(39) = –.32$; percentage of GNP per capita spent on health, $r(37) = –.37$, $p < .05$; relative status of women, $r(34) = –.39$, $p < .05$; purity, $r(23) = .48$, $p < .05$; and alcohol consumption, $r(51) = –.29$, $p < .01$.

For psychological variables, fate control, $r(1, 25) = .43$, $p < .05$, and average length of emotions, $r(20) = .43$, $p < .05$, were correlated with national rates of homicide.

MULTIPLE REGRESSION USING SOCIETAL FACTORS INCLUDING COLUMBIA

To eliminate bias due to outlier influence, only results common to both sets of analyses will be put into the regression equation, viz., GNP per capita, GINI, average annual growth of GNP per capita from the economic factors; human rights, percentage of GNP per capita spent on health, relative status of women, and purity from other societal factors; and average citizen endorsement of fate control and average length of emotions from the psychological variables.

At this stage, we wished to summarize the correlational results from societal factors by identifying the simplest equation to predict national homicide rates. As past studies (e.g., Karstedt, 2001; Wilkinson et al., 1998) have found relationships between economic factors and homicide rates, and as economic data were the strongest predictors of national homicide rates, those economic factors showing significant correlations were first entered into the regression equation. They were entered one after the other in a blocked regression and retained only if they showed a significant F change, thereby indicating that they had added predictive power over and above that already provided by the preceding entrants. Similar to the procedures in the correlational analyses, regression analyses will be run with data sets including and excluding Columbia.

In the regression analysis with Columbia, economic factors including GNP per capita (negative), and GINI, average annual growth of GNP per capita were initially entered in the equation, using a stepwise procedure, to determine the best package of economic variables. Only GINI and average annual growth of GNP per capita entered the multiple regression equation predicting homicide rates, with the two variables together explaining 28% of the variance in homicide rates ($p < .001$; $df = 2, 45$). As a result, GINI and average annual growth of GNP per capita formed the first block of the summary equation for homicide rates.

Noneconomic, societal variables that predicted homicide were then entered into separate regression equations, to ascertain if it significantly increased the variance in national rates of total homicide over and above that already explained by GINI and GNP per capita. Owing to

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the problem of the reduced sample size caused by adding these societal variables, we set an arbitrary requirement for an overlap of at least 20 cases.

Initially, the relative status of women (beta = .33, $p < .05$), divorce rate (beta = .30, $p < .025$), and sex ratio (beta = –.40, $p < .001$) each produced significant F changes after being entered separately in the second block. These variables were then entered in pairs after GINI and GNP per capita to discover if they added significant variance as a pair and, if so, whether both members of the pair were significant, additional predictors of national homicide.

Pairing the relative status of women together with the sex ratio added significant variance to GNP per capita and GINI ($df = 32$, $p < .01$). However, only the sex ratio was a significant predictor in the final equation. We therefore reverted to the equation that added the sex ratio to GINI and GNP/capita. This three-variable equation explained 66% of the variance in national rates of homicide.

Regression equations often involve predictor variables that are themselves interrelated. This multicollinearity can produce statistical artifacts, such as suppression effects, that yield invalid results. This possibility is assessed by determining the variance inflation factors (VIFs) and tolerance figures for each regression equation. Multicollinearity was not a concern in any of the multiple regressions reported above, however. The VIFs were below 10, and the tolerances were all above .1 for all equations. Total unemployment explained 5% of additional variance ($df = 43$; $p < .05$), and purity explained another 19% of the variance ($df = 19$; $p < .01$). When the two variables were put into the equation with the two economic variables, they together explained 54% of the variance in national rates of homicide ($df = 18$; $p < .01$).

MULTIPLE REGRESSION OF SOCIETAL FACTORS EXCLUDING COLUMBIA

The regression analysis excluding Columbia followed the same variables and same procedures. Economic factors including GNP per capita, the GINI coefficient, and average annual growth of GNP per capita were initially entered into the equation, using a stepwise procedure. Similar to the analysis with Columbia, GINI and average annual growth of GNP per capita were significant, explaining 52% of variance in homicide rates. The two variables then underwent the regression again, using the Enter procedure. This time they explained 52% of variance ($df = 44$; $p < .01$). Thus, GINI and the average annual growth of GNP per capita formed the first block of our regression equation.

Societal variables were put into the equation one by one as the second block. Adding human rights increased the variance explained to 72% ($df = 32$; $p < .01$); adding purity increased the variance explained to 70% ($df = 18$; $p < .05$). When the two variables were put into the equation together, they increased the variance explained for national rates of homicide to 80% ($df = 17$; $p < .01$).

PSYCHOLOGICAL MEDIATION OF THE SOCIETAL PREDICTORS

In identifying possible psychological mediators, significant correlations must first be found between the societal variable and homicide, between the societal variable and the mediating variable, and between the mediating variable and homicide rates (Judd & Kenny, 1981). Relationships between the psychological mediators and homicide are found from the correlations above, in which (negative) trust, (negative) social complexity, and (negative) preference for a mate based on love as opposed to status were each correlated with total homicide rates.

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The next step was to link the mediating psychological variables with economic and sociopolitical variables. Here, fate control and trust were found to be correlated with GNP per capita, $r(33) = .57$, $p < .01$, and $r(35) = .63$, $p < .001$, respectively. Mate preference based on love as opposed to status was correlated with GINI, $r(26) = -.51$, $p < .01$, GNP per capita, $r(29) = .70$, $p < .01$, and the sex ratio, $r(30) = -.47$, $p < 01$. Based on these correlations, mediation processes could only be explored among fate control, human rights, and purity.

Ideally, testing such mediation should be done through tests of hierarchical blocked regression, as outlined by Judd and Kenny (1981). In this study, however, we are dealing with nations rather than with individuals, so the normal statistical preference for large numbers of cases cannot be applied. As a first approximation, however, we can enter the psychological mediator as the first block in a regression equation, and then enter the linked societal variable in the second block. If the societal variable still adds significant variance, it is probable that the psychological variable does not fully mediate the effect of the societal variable. The amount of variance still explained by the societal variable in the second block gives some idea about the degree of mediation achieved. If, however, the societal variable does not add significant variance in the second block, then it is probable that the psychological variable fully mediates the effect of that societal variable.

MEDIATING EFFECTS OF FATE CONTROL

Testing for the mediating role of psychological variables will be done with data sets including and excluding Columbia. As reported above, citizen scores on trust and fate control were correlated with GNP per capita, whereas mate preference based on love as opposed to status was correlated with GNP per capita, GINI, the sex ratio, human rights, and purity, but only purity survived in the regression analysis of both datasets, so only purity will be tested for mediation through fate control. The possible mediation effects of these citizen scores will thus be tested in these sets of societal variables.

Citizen scores on social complexity was entered in the first block, then GNP per capita into the second block. GNP per capita explained significant additional variance in the second block (adjusted R^2 increase = 15.5%) over and above that explained by social complexity alone in the first block (adjusted $R^2 = 11.6\%$), implying that citizen scores on social complexity only partially mediated the effects of GNP per capita on national rates of homicide. Note that GNP per capita alone explained 22.3% of the variance in homicide rates with this group of 25 nations.

The same procedure was followed with citizen trust scores. As with social complexity, trust was found to only partially mediate the effects of GNP per capita on national homicide rates. GNP per capita explained significant additional variance in the second block (adjusted R^2 increase = 22.6%) over and above that explained by trust alone in the first block (adjusted $R^2 = 14.4\%$). Note that GNP per capita alone explained 32.4% of the variance in homicide rates with this group of 32 nations.

For both regression equations, either including or excluding Columbia, the societal factor of purity was insignificant when entered in the second block. This result suggests that fate control plays a mediating role for purity's relation to national rates of homicide. Next, mate preference based on love as opposed to status was entered in the first block, and then GNP per capita, GINI, and the sex ratio were entered in the second block in three successive blocked regressions. For two of these blocked regressions, in this second block, GNP per capita and the sex ratio no longer explained significant additional variance. It thus appears that the effects of GNP per capita and of the sex ratio on homicide were completely mediated

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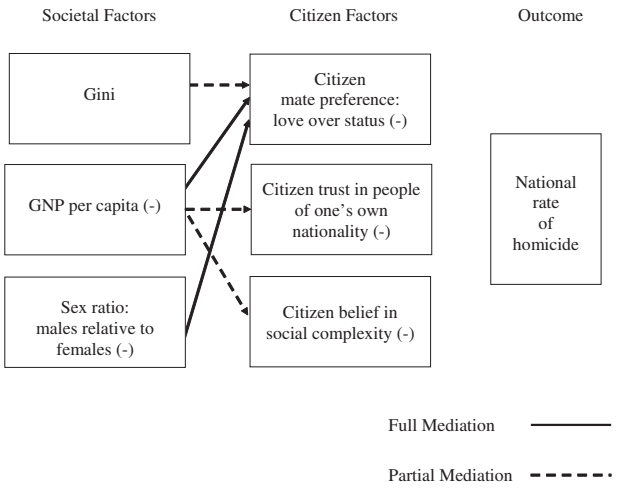

Figure 2: The Mediational Relationships of Psychological, Citizen Scores to Societal Variables in Predicting Total Homicide Rate Across Nations

by citizen scores on mate preferences based on love as opposed to status. Note that GNP per capita alone explained 36.2% of the variance in homicide rates with this group of 20 nations; the sex ratio alone explained 14.7% of the variance.

This mate preference score did not, however, eliminate GINI as a significant factor in the second block. GINI explained significant additional variance in this second block (adjusted R^2 increase = 14.3%) over and above that explained by mate preference based on status as opposed to love alone in the first block (adjusted R^2 = 30.6%). This outcome implies that mate preference scores based on status as opposed to love only partially mediated the effects of GINI on national rates of homicide. Note that GINI alone explained 29.1% of the variance in homicide with this group of 28 nations.

Again, multicollinearity was not a concern in any of the multiple regressions reported above. The VIFs were below 10 in all cases, and the tolerances were all above .1. Total unemployment explained 5% of additional variance (df = 43; $p < .05$), and purity explained another 19% of the variance (df = 19; $p < .01$). When the two variables were put into the equation with the two economic variables, they together explained 54% of the variance in national rates of homicide (df = 18; $p < .01$).

In summary, the separate societal predictors of national homicide rates are GINI, negative average annual growth of GNP per capita, and negative sex ratio. The psychological variable of fate control appears to completely mediate the effect of the sex ratio and of GNP per capita on homicide, and to partially mediate the effect of GINI on homicide. Citizen scores on social complexity and on trust appear to partially mediate the effect of GNP per capita and on homicide. Figure 2 summarizes these findings.

DISCUSSION

In this study, we gathered a wide set of societal factors that have been adopted in the criminological literature on theorizing about homicide and attempted to synthesize them into the simplest and most complete set of predictors possible. These turned out to be GINI, GNP per

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capita (negative), and the sex ratio (negative). In addition, psychological variables providing comparable citizen scores across many nations were added to our theorizing in an attempt to assess which factors are important for building psychologically informed models for national differences in homicide. These turned out to be lower trust, lower social complexity, and preference for mate selection based on the partner's status as opposed to love. Combining these different types of variables facilitated the linking of psychological variables to societal variables empirically. This is a sensible undertaking for understanding any socially significant but statistically infrequent event, like homicide or suicide, where individual-level studies are understandably difficult to perform.

Typically, results from work at the societal level are used to speculate about probable operative mechanisms at the psychological level. The implied argument is that certain institutional structures conduce toward a generally higher level of the presumed psychological determinant in a given society, thereby resulting in higher levels of homicide. Results of this study identify empirically some of these operative psychological variables, or variables associated with those operatives, viz., lower trust in one's fellow citizens, lower belief in fate control, and preference for a mate of high status rather than love. The use of blocked regression facilitated the identification of the societal variables that partially or wholly affect homicide rate through those psychological mediators.

We made five predictions at the outset: (a) Neuroticism will mediate the effect of inequality on homicide. This reasoning was not confirmed. (b) Preference for a mate with status as opposed to love will mediate the effect of inequality on homicide. This hypothesis was confirmed, with preference for a high status mate partially mediating the effect. (c) Emotional restraint will mediate the effect of national wealth on homicide. This reasoning was not confirmed. (d) Social axioms will mediate the effect of national wealth on homicide. This prediction was confirmed for social complexity, which partially mediated the effect. (e) Trust will mediate the effect of national wealth on homicide. This prediction was confirmed, although trust only partially mediated this effect.

It was particularly surprising that citizen neuroticism, hypothesized to drive aggression, did not correlate significantly with homicide rate, and so could not be examined for its possible mediating role. The examination of links between the Big Five dimensions of personality was, however, compromised by a low overlap of nations with both Big Five and homicide scores. Even with so few overlaps, however, the correlation between citizen neuroticism and homicide was .37, the highest among the five correlations (see also Lynn & Martin, 1995). However, citizen neuroticism did not correlate with GNP, GINI, or the sex ratio, so it would not appear likely to mediate the effects of these three societal variables on national homicide. It may, however, mediate a fourth as yet unknown societal variable identified in further research.

THE SOCIETAL FACTORS RELATED TO HOMICIDE

GINI, negative average annual growth of GNP per capita, and the negative purity sex ratio were identified by our regression procedure as conceptually distinct (although not statistically independent) building blocks for theorizing about homicide from societal variables. It should be noted that another economic variable, GNP per capita, was correlated with homicide rates whether Columbia was included or not. GNP per capita is highly correlated with GINI, however, and it proved the more powerful variable when pitted against GINI. Effects for average annual growth rate were, however, independent of those for GINI, implying that it exercises its effect on national rates of homicide through separate channels and so should

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be considered separately. The same logic applies to evaluating how purity operates on homicide rates. Relative economic inequality as tapped by the GINI coefficient is a consistent predictor of homicide rates in cross-national research (LaFree, 1999; e.g., Wilkinson et al., 1998), indeed of many social ills (Wilkinson, 1996). It has been hypothesized to affect homicide through the agency of social stress arising from unfavorable social comparisons being made by disaffected citizens of lower status (Wilkinson, 1996). In this study, a nation's GINI coefficient correlated with the psychological variable of preference for a mate of higher status, which was found to partially mediate the relationship between GINI and homicide.

This finding is consistent with Wilkinson's (1996) social psychological theorizing about status envy and resentment but suggests that the GINI effect may also operate through the agency of some other, as yet unmeasured psychological variable characterizing a nation's citizenry. Relative economic inequality is a pervasive economic variable whose effects on citizen psychological processes are likely to be wide-ranging. Some of these citizen characteristics will also correlate with national rates of homicide and may thus provide further psychological variables yielding citizen mediators for GINI's effect on homicide.

GINI itself relates negatively to a variety of other societal variables, viz., GNP, human rights observance, domestic political violence, freedom, democracy, average growth of GNP per capita, percentage of GNP dedicated to health and to education, women's relative status, divorce rate, alcohol consumption, and gender empowerment, and positively with the sex ratio (Lim, 2001). This is a complex latticework of factors, in which some of the three other societal variables also related to homicide in this study, viz., human rights observance, percentage of GNP dedicated to health, and women's relative status. Theoretically, most of these societal variables relating empirically to GINI share a conceptual linkage to GINI with respect to their egalitarian societal thrust. Higher human rights observance, democracy, and freedom provide due process for the less advantaged; a higher percentage of GNP dedicated to health provisions protects life for the less advantaged; higher relative status for women and gender empowerment indicates greater access by women to a variety of social resources; and a higher growth of GNP per capita may indicate an overall improvement in the well-being of the whole society. That GINI and some of these three societal indices all predict homicide negatively suggests that a pervasive denial of access to resources is a major theme driving homicide in a nation's citizenry. This conclusion is compatible with institutional anomie theory that treats societal institutions as buffers protecting its citizenry from economic vicissitudes and thereby acting as a prophylactic against homicide (see, for example, Savolainen, 2000).

These societal features will have their interpersonal and psychological representations. Wilkinson (1996) has discussed perceptions of stress and disrespect felt by the disadvantaged that fuel hostility. We did not have a measure for this particular variable in this study but believe that a generally stronger preference for mates with status indicates a widespread orientation toward the acquisition of resources that is potentiated by living in a society with a wider gap between the rich and the poor. There will be other components of this orientation toward acquisitiveness and its social psychological sequelae that also relate to a nation's homicide rate. Values relating to power (Schwartz, 1992) are an obvious candidate, as is a belief in fate control that was very nearly statistically significant in this study.

GNP per capita related negatively to national homicide rate in our final regression equation. It was a separate predictor from GINI, despite the fact that these two economic indices were correlated –.42. This empirical distinctiveness indicates that the conceptual relation of wealth to national rates of homicide should be considered separately from GINI's relation to homicide, and its different modes of operation explored. Wealth is a broad constellation of

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societal factors discriminating nations (Georgas et al., 2004; Sawyer, 1967) and may be considered as a major societal characteristic driving modernization. As a key measure of the wealth of nations, GNP per capita relates to a host of societal variables taken as measures of social/political development, such as the relative status of women, the level of democracy, and so forth. Many of these measures overlap with those associated with GINI, but there are differences: GINI related to the sex ratio positively, whereas GNP per capita did not; GNP per capita related to the percentage of GNP spent on education positively, and to total unemployment negatively, whereas GINI did not relate to either variable. It is probable that these different societal features associated distinctively with GNP would introduce somewhat different socialization processes and hence psychological outcomes for a wealthy nation's citizens, compared to citizens in nations with high levels of economic inequality.

Lim's (2001) study revealed that wealthier nations have citizens higher on extroversion and higher on openness to experience, who report having more recent emotions that last a shorter time, and who endorse higher social complexity, but who endorse lower reward for application, religiosity, and fate control in their belief systems; they choose mates based on love rather than status. They also trust their fellow citizens more. These psychological characteristics could be said to form part of the profile of persons in economically modernized nations (Inglehart, 1997; Yang, 1988). Of these dispositions, trust, the choice of mates based on love rather than status, and a belief in social complexity also predicted homicide rates, negatively.

Our regression analysis indicates that citizen levels on these psychological variables can mediate the relationship between GNP per capita and homicide rate: Mate preference for love over status mediated the relationship between GNP per capita and homicide rate fully; trust and a belief in social complexity mediated the relationship between GNP per capita and homicide rate partially. A preference for love over status in the choice of mates may indicate a widespread response toward others that counteracts treating them violently when they frustrate our instrumental purposes. Fukuyama (1995) has discussed the role of trust in maintaining civic order and in restraining citizens from acts of depredation toward their fellow citizens. Indeed, we consider trust in one's fellow citizens to be enabled by the existence of a stable polity characterized by legal and enforcement institutions that are perceived by a nation's citizens to work effectively. Disaffected individuals may then restrain their homicidal impulses to retaliate and exact retribution because it is illegal to do so and because social agencies are responsive in prosecuting offenders (see also Rosenfeld, Messner, & Baumer, 2001). A belief system that endorses social complexity may interpose a set of cognitive constraints and moderators that buffer the simple, direct thinking associated with homicidal solutions to interpersonal problems, as suggested from empirical work on beliefs and styles of conflict resolution (Bond et al., 2004).

When considering GNP per capita's relation to homicide, one wishes for citizen scores on other types of psychological variables in exploring possible mediation. Values are one such variable, especially those associated with the domain of benevolence (Schwartz, 1992). In light of recent theorizing about the importance of emotional regulation in restraining acting-out behaviors (Eisenberg, 2000), a measure of the disposition to control emotional expression, such as that used in the Scherer and Wallbot (1994) study, would also be instructive. Length of emotional experience was very nearly significant in its relation to homicide in this study and is closely related to GNP per capita, so that citizen variations in various aspects of emotional experience seem a promising area to explore further in the study of homicide.

The emergence of the sex ratio as a significant additional predictor for national rates of homicide was a surprise. Given that males are the more likely perpetrators of homicide in any

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society, we had originally included this variable in the analyses for purposes of statistical control, fully expecting that societies with proportionally more males should have proportionately higher overall rates of homicide. Instead, it was societies with proportionately more females that showed higher homicide rates.

In attempting to understand this paradoxical outcome, it is instructive to examine societal correlates of the ratio of females to males. Nations with higher proportions of females relative to males were higher in human rights observance, higher in the relative status of those women, enjoyed more freedom, spent proportionally more of their GNP on education and health but less on military expenditure, and showed more divorce (Lim, 2001). One might characterize such nations as more libertarian in their social and political practices.

Why, then, are they more murderous? Evolutionary theorists have argued that males represent a greater social resource than females. In a nation where there are proportionately more females than males, there would therefore be relatively greater resource competition, because more of that society, its females, would be less able to fulfill their resource demands by pairing with a relatively more desirable resource, a male. This speculation is supported by the research of Low (1989) who studied socialization training for adaptive characteristics in 93 societies. She concluded that across societies, young males are socialized for greater endurance, self-reliance, and fortitude. However, this enhanced assertiveness training for males was greater the more polygynous the social system. Could this education for heightened competitiveness among the males in such disproportionately female societies be driving their higher rates of homicide?

Consistent with this reasoning, nations with relatively more females to males were shown by Lim (2001) to have citizens who are more extroverted, less agreeable, and less conscientious; to select mates based on status rather than love; and to be lower in beliefs in reward for application and in religiosity. Of these citizen characteristics, a preference for a mate based on status rather than love was shown to fully mediate the link between a nation's sex ratio and its homicide rate. As with the results for a nation's economic inequality, likewise partially mediated by mate preference for status, this result suggests the importance of status hunger (Wilkinson, 1996) as a source of homicidal activity: Mates are one source for a partner to acquire power, influence, and material resources, and in a nation where such status hunger is higher, homicide would be greater as a consequence of citizen socialization for acquisitive, competitive interactions with others (Agnew, 1999). As with our attempts to explain the effects of GNP per capita and GINI on homicide, one would wish for citizen scores on values, especially those related to power (Schwartz, 1992), as a way to reinforce this argument based on status hunger as a psychological characteristic of citizens potentiating homicide.

PROBLEMS WITH NATION-LEVEL ANALYSES OF SOCIAL BEHAVIOR

This was a nation-level study where national indices—societal features or citizen scores on psychological variables—are being related to one another. Use of such data to understand psychological dynamics driving homicide is risky because individual-level analysis and national-level analyses are different. This study attempted to resolve this problem by using citizen scores (i.e., average population scores taken from psychological constructs shown to be made up in metrically equivalent ways across all national groups). We believe that such citizen scores enable our discipline to span and link the national and individual level of analysis. They are becoming more available for use, as we extend the reach of multicultural projects and analyze the resulting data in ways that yield statistically equivalent measures of the psychological constructs.

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In attempting to do so, however, one is constantly beset by the problem of data availability. Correlations become unstable when *N*s approach 20, and unrepresentativeness of the units sampled may result if such data are only available from certain parts of the world or from economically advanced countries. These concerns are compounded when one attempts a mediational analysis, because the analysis requires the overlap of nations on three variables. These concerns are endemic to such analyses, however, and place a greater burden on integration of results with established theory and empirical work at both societal and psychological levels. Given the social importance of homicide and other rarely occurring events, however, we propose that the normal rules of evidence be relaxed in exploring such problems.

CONCLUSION

This study has cast a wide net across societal indicators in an attempt to adduce a more comprehensive and differentiated model to explain national rates of homicide. Three such distinct indicators—GINI, negative GNP per capita, and the negative sex ratio of males to females—emerged from our analysis, accounting for a considerable amount of the variance in homicide. Additional, promising measures of societal variation, such as recent histories of waging war (Ember & Ember, 1994) or ecological disaster (Bond, 2004), are needed in future work to enlarge the model's predictive power even further.

To elaborate this model using psychological inputs, a variety of relevant citizen scores were likewise correlated with national rates of homicide. Using blocked regression, we found that lower levels of trust in one's fellow citizens, lower levels of belief in social complexity, and mate preference based on status rather than love fully or partially mediated the linkages between the three societal indicators and homicide rates. Socialization for distrust of others, simplicity of beliefs about how society works, and of status-seeking would thus appear to be important characteristics of citizens in more homicidal nations. Further examination of national homicide will benefit from cross-national studies assessing an even wider range of psychological measures, especially of socialization processes and their consequences for a citizenry's values or goals. It appears that socialization for anomic relationships, for cognitive simplicity, and for individual acquisitiveness enhances the rate of lethality in a nation, and the availability of a broader range of psychological measures would enable us to detect the nomological networks of these associations more comprehensively.

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Flora Lim obtained her bachelor's degree in psychology from the Chinese University of Hong Kong in 2002. During her undergraduate study, she worked with Professor Bond on her thesis study of homicide across nations. Currently, she is working in Hong Kong as a human resources manager for a small Japanese-run firm.

Michael Harris Bond has been practicing social psychology for the past three decades at the Chinese University of Hong Kong where he is a professor of psychology. He is fascinated by culture, having been socialized into a Torontonian English Canadian one, followed by an American graduate education, and an extended cross-cultural immersion as a research associate from 1971 to 1974 at Kwansei Gakuin University in Japan. Throughout much of this cultural awareness raising, he has been a member of the Baha'i Faith. This religious practice has further extended his contact with representatives of other cultural realities, sharpened his appreciation of pervasive societal influences, and opened his sensibilities to Islamic art, literature, and philosophy. He is the coauthor, with Peter Smith and Cigdem Kagitcibasi, of the forthcoming Social Behavior Across Cultures: Living and Working With Others in a Changing World *(Sage, London).*

Mieko Kuchar Bond is a Ph.D. candidate at the University of Manchester, United Kingdom. She completed her M.Phil. in criminology at Cambridge University and then worked for the Institute of Criminology and Home Office, United Kingdom, before undertaking a doctoral program. Her research interests include homicide and violence against women, particularly using cross-national studies.

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