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The Poverty-Crime Nexus Revisited: Absolute poverty, relative poverty, and crime rates in 105 countries.

Andrew Dunn

Abstract

Criminological writing on the poverty-crime nexus has suffered from a lack of engagement with academic work about the definition of poverty. Furthermore, researchers who have connected nations' crime rates to their poverty levels have tended to use infant mortality rates (a health outcome variable) as a proxy for poverty. This article presents findings from the first study of cross-national crime differences to use measures of 'absolute' poverty (% with purchasing power under \$1.90 per day at 2011 prices) and 'relative' poverty (% with income below 50% of the national median). Both measures correlated positively with rates of assault/mugging, stealing, homicide, and intimate partner violence against women. Relative poverty is closely connected to inequality, while absolute poverty is closely connected to low socio-economic development, so the findings are consistent with the view that economic inequality is generally criminogenic whereas modernisation is not.

Keywords: Absolute Poverty, Crime, Gallup World Poll, Homicide, Relative Poverty, Victim Studies

Introduction

Willem Bongers's (1916) 'Criminality and economic conditions', first published in 1905, broke new ground by putting material deprivation centre stage when discussing the causes of crime. Since then, links between poverty and crime have been a common feature of criminological writing. Yet there is a hitherto unacknowledged disjuncture between academic work about the poverty-crime nexus and the sizeable body of academic writing about how the word poverty should be defined (landmark examples of the latter include Townsend, 1962; 1979; Sen, 1983). Heavily cited works by leading criminologists have included 'poverty' as a variable without making clear what they mean by it (for example, Pratt & Cullen, 2005). Furthermore, on this article's specific topic – cross-national comparisons of crime rates – even those authors who lamented the absence of a poverty variable in quantitative analyses (Paré & Felson, 2014; Pridemore, 2011) did not cite any books or articles about the definition of poverty, and they did not explain why they used infant mortality rates as a proxy measure of poverty instead of the World Bank's poverty measures. As this article argues, neglecting debates about poverty definition carries serious implications because the key, rival definitions highlighted by poverty experts are closely linked to rival theoretical explanations of cross-national differences in crime rates: 'relative' definitions (and hence measures) of poverty are closely linked to national levels of economic inequality, whereas 'absolute' definitions / measures are closely linked to how poor a country is overall (Lister, 2021); similarly, leading criminological explanations of cross-national differences in crime rates emphasise either inequality or socio-economic development (see Howard et al, 2000; Oberwittler, 2019).

This article is the first to foreground rival definitions of poverty when discussing national crime rates; its empirical part, which aims to provide a broad overview of findings about poverty and crime rates, is the first to compare nations' crime rates using both 'absolute' and 'relative' poverty measures. The next section starts by examining academic work on the definition of poverty. It identifies the absolute-relative poverty continuum as crucial to understanding what poverty can be said to mean, and therefore advocates measuring poverty from both extremes of that continuum. The section after that connects these two definitions / measures to key theories offered as explanations of differences in national crime rates, including Robert Merton's classic strain theory that linked inequality to crime, Steven Pinker's claims of western socio-economic development reducing brutality, and the Durkheimian notion that such modernisation processes, in weakening traditional social control mechanisms, tend to be criminogenic. Existing empirical literature on national crime rates and poverty is then reviewed. The rest of the article focuses on an empirical project that asks whether 'absolute' or 'relative' poverty is more closely linked to differences in nations' crime rates; in other words, the research's main purpose was to find out whether virtually eliminating the harshest absolute material conditions (i.e. *absolute* poverty), or, alternatively, reducing inequalities as they affect the poorest in a particular society (i.e. *relative* poverty), is most associated with a low crime rate. Crimes covered by the analysis are homicide, assault/mugging, stealing, and intimate partner violence against women. The research includes both bivariate tests and linear regression analysis that controlled for relevant variables. A discussion / conclusion reflects upon the article's main points and seeks possible explanations of the main empirical findings.

Defining poverty: absolute and relative

Leading experts identify 'absolute' poverty and 'relative' poverty as the concept's two main definitions (see Lister, 2021). Dunn (2023) traced the two back to the following passage from 1843, which was written by German political activist Wilhelm Schulz amid unprecedentedly rapid economic growth in western Europe, and was quoted the following year by Karl Marx (see Marx, 2011, p.18):

But even if it were as true as it is false that the average income of every class of society has increased, the income-differences and relative income-distances may nevertheless have become greater and the contrasts between wealth and poverty accordingly stand out more sharply. For just because total production rises — and in the same measure as it rises — needs, desires and claims also multiply and thus relative poverty can increase whilst absolute poverty diminishes. The Samoyed living on fish oil and rancid fish is not poor because in his secluded society all have the same needs. But in a state that is forging ahead, which in the course of a decade, say, increased by a third its total production in proportion to the population, the worker who is getting as much at the end of ten years as at the beginning has not remained as well off, but has become poorer by a third. (Schulz 1843, pp. 65-66)

Schulz's passage implied support for 'relative' poverty ("relative armuth" in the original German – Schulz, 1843, p.65), whereby the average or usual material conditions in a whole society determine what poverty means. Over a century later, British Sociologist Peter Townsend combined Schulz's idea of relative income poverty with Charles Booth's pioneering use of a poverty 'line' (see Simey & Simey 1960, p. 88) when he suggested

setting such an income-based poverty line “at, say, 50 per cent or 66 per cent of the [national] average” (Townsend 1962, p. 222). Shortly afterwards, US economist Victor Fuchs (1967) suggested the 50 per cent of national *median* income relative poverty line that was later adopted by the World Bank.

Like Schulz (see above), Townsend (1979) defended his thoroughgoing relativism by insisting that any increase in national living standards is necessarily nullified by a corresponding increase in human material need. Some other leading poverty authors firmly reject this notion. Most notably, the Indian economist and future Nobel laureate Amartya Sen (1983, p.156) criticised what he called Townsend’s “purely relative” definition of poverty for being too inequality-based, as it neither takes proper account of the “gains shared by all” in a society during periods of economic growth nor the “additional people in misery” during economic slumps. Indeed, because purely relative poverty lines do not take account of *absolute* material conditions, when they are applied to a richer and a poorer nation they arguably fail to delineate the same level of material hardship.

While a purely relative definition or measure takes no account of people’s absolute purchasing power, a (purely) absolute poverty line is applied at the same level across diverse nations and eras. The most widely known absolute poverty measure is the World Bank’s, which counts as poor all those with incomes below \$1.90 per day at 2011 prices, and at ‘purchasing power parity’; thus, an attempt is made to ensure that the same basket of goods and services can be bought at the poverty line in different countries (see Saunders [2018] for a detailed methodological discussion about the measure); the measure is based on the ‘dollar a day’ idea suggested in 1990 by the World Bank’s head of research, Australian economist Martin Ravallion (see Evans, 2023). While most poverty experts

consider absolute measures inferior because they overlook context-specific human needs, they are often regarded as a useful supplement to relative measures as they gauge the numbers suffering extreme material deprivation (see, for example, Mack & Pomati, 2022). Moreover, some leading economists who support Sen in rejecting a purely relative definition for its implication that changes in real national income per capita count for nothing have developed measures that are compromises between purely absolute poverty and purely relative poverty (most notably, Ravallion & Chen, 2011). Yet as Dunn (2023) notes, such noble attempts to reconcile the two approaches inevitably require arbitrary judgements on how much weight to assign to social context and how much to absolute purchasing power - thus, they are 'caught between two stools'. Nevertheless, even if absolute and relative approaches are irreconcilable, they might be considered complementary: each provides unconvoluted findings from one extreme of the absolute-relative poverty definition continuum and, therefore, presenting absolute and relative findings together delivers the most balanced and complete picture of material hardship levels we have. This is one reason why the empirical study presented later in this article employed both absolute and relative poverty measures. A further reason is put forward in the next section, which examines connections between poverty definitions and theoretical insights concerning crime rates around the world.

Poverty definitions and explanations of cross-national differences in crime rates

Both 'relative' and 'absolute' poverty definitions are closely linked to leading theories that seek to explain cross-national variations in crime rates, as the latter tend to focus on either inequality or socio-economic development. Relative poverty is so closely linked to inequality

that national Gini coefficients for income inequality correlate at a strength of 0.8-0.9 with their (purely) relative income poverty rates (see Karagiannaki, 2017, p. 11; using data for the 105 countries that feature in the regression analysis presented here, the coefficient is 0.83). Yet the relationship between the two can vary, as was shown when UK Labour governments (1997-2010) targeted resources at poorer families to reduce relative poverty whilst inequality across the entire income distribution remained stable (see Dunn & Saunders, 2022, p. 935). Similarly, absolute poverty rates also have a strong but imperfect connection with real GDP per capita. For the 105 countries (listed in Appendix A) in the regression models presented here the correlation is -0.73; the 35 countries with the lowest real GDP per head have a mean absolute poverty rate of 24.0%, while the corresponding figure is 5.1% for the 'middle third' of countries and 0.4% for the 35 with the highest real GDP per head. For non-monetary indicators of low socio-economic development (illiteracy rates, percentage of [in our case males] aged 18-25, and bad governance) correlations are all around 0.5-0.6 (see Appendix B).

With such correlations in mind, the following discussion about leading explanations of cross-national crime differences highlights their hitherto neglected relevance to absolute and relative poverty definitions / measures. With comparative criminology literature focusing heavily on homicide, and most studies concluding that inequality is a key explanation of cross-national homicide rates (Koeppel et al., 2015; Tuttle, 2022), strain theories have been prominent. Merton's strain theory asserted that relative disadvantage / deprivation, in the context of U.S. free market capitalism and its associated individualistic, aspirational ethos, was criminogenic, as those blocked from achieving socially valued goals the conventional way sometimes, in their frustration, resorted to criminal actions (see Merton, 1938, p.676). Recent accounts of the criminogenic impact of now ascendant neoliberalism (e.g., McLean

et al., 2019), in their emphasis on rising inequality accompanied by self-interested and acquisitive behavioural traits, echo both strain theory and Bonger's (1916) earlier work. All these various criminological accounts emphasise *self*-perceived deprivation or disadvantage, which matches widely endorsed understandings of 'relative deprivation' as a social psychological concept (see, for example, Smith & Pettigrew, 2018). W.G. Runciman's (1966) use of the term 'relative deprivation' more closely matches this usual criminological understanding of the term than does Townsend's (1979), as Runciman defined the concept as relating to subjective feelings, whereas Townsend wholly disregarded subjective feelings when discussing 'relative deprivation'. Of course, no relative poverty line set at a percentage of median income takes account of *subjective* feelings of deprivation, and nor does the Gini coefficient for income inequality, which is widely used as an indicator of relative deprivation in cross-national criminological research. Thus, while criminological research employs an indicator of relative deprivation (the Gini coefficient) that correlates strongly with relative income poverty measures, it does not capture the attitudes towards inequality that are crucial to 'strain' and related theories. Furthermore, it might be argued that relative income poverty lines better capture the conditions 'strain' theories suggest are criminogenic, as such lines are in the poorer half of the income distribution, whereas the Gini coefficient also takes account of economic inequalities among a country's richer citizens.

Among criminological theories of cross-national crime differences that focus on socio-economic development, modernisation / social disorganisation theory has long been the most popular. However, perhaps due to LaFree's (1999) landmark review observing that its popularity vastly outweighed its supporting evidence, that popularity has waned since (see Koepfel et al.'s, [2015] later review). This theoretical perspective is rooted in Émile Durkheim's understanding of the transition to a modern, more urban, industrial society, and

sees this transition as criminogenic due to the breakdown of a previous stable social order that provided clear normative guidelines and close familial and local community support mechanisms. Durkheim (1960), writing in 1893, suggested that the 'mechanical solidarity' (based on sameness) of traditional, village life was undermined by the urbanisation and industrialisation of early capitalism, which produced communities of 'organic solidarity' (based on interconnectedness), in a wider society of weaker social ties (see Howard et al., 2000, pp. 148-150; Schaible, 2012, p. 798). Shaw & McKay's (1942) social disorganisation work identified a lack of social control amid a rapid turnover of residents in the deprived, socially diverse area of early-Twentieth Century Chicago they called the 'zone in transition'. Comparative criminologists have applied these ideas to whole countries at different stages of economic development (see LaFree, 1999, p. 140). The theory's implication that crime increases alongside economic growth has perplexed those economists who insist that rising real income per head disincentivises criminal behaviour by increasing the 'opportunity cost' of committing a crime (see, for example, Soares & Naritomi 2010, p. 158, who draw upon Gary Becker's [1968] highly influential article); thus, for these economists, the economic development that tends to be accompanied by a reduction in absolute poverty also tends to deliver a reduction in crime. Indeed, even some otherwise pessimistic accounts of modernisation / socio-economic development mention its crime-reducing tendency, whereby social control is eventually restrengthened through increasingly effective modern state institutions (see, for example, Howard et al., 2000, p. 148).

The civilisation thesis offers the main optimistic account of modernisation and crime. It asserts that economic development, along with accompanying institutional developments, has precipitated a pattern of less violent behaviour (see Elias, 2000 [1939]; Pinker, 2011). Pinker (2011) presented a graph of "real income per person in England, 1200-2000" (p. 206)

showing a steep upward curve since around 1800 and asserted that “Money does not just fill the belly and put a roof over one’s head; it also buys better governments [and] higher rates of literacy” (p. 207). Pinker (2011) did not mention poverty definitions but his view that poverty is heavily concentrated in countries with low real income per capita implies support for a definition that is far from purely relative. For example, pointing to evidence of more civil wars in poorer countries he explained that “poverty causes war because poor people have to fight for survival over a meagre pool of resources” (Pinker, 2011, p. 369). Thus, the leading present-day exponent of the civilisation thesis implies that a reduction in absolute poverty is important in precipitating a reduction in violence.

While economic growth is said to deliver the benefits highlighted by Pinker, it is also said to have increased opportunities for acquisitive crimes. Cohen & Felson’s (1979) influential ‘routine activities theory’ attributes the dramatic rise in crime in the UK and elsewhere amid mid-to-late 20th Century affluence partly to an increase in such “suitable targets” (p. 588). Bennett & Lynch’s (1990) early review of empirical work on cross-national crime rates seemed to imply support for the opportunities approach in explaining the increase in property crime in western countries since 1945, while also implying support for the civilisation thesis as an explanation of the accompanying lower rates of violence. In the following exploration of the more recent empirical findings, theories examined here are again relevant, and again links are made between the current state of knowledge and relevant points about absolute and relative poverty.

Existing evidence on national crime rates and poverty levels

As cases of homicide leave no living victim, the best data on homicide levels is inevitably found in official records, not studies of victims. The two main sources of cross-national data on homicide are from the WHO (which is mainly from health systems) and the UN (mainly from criminal justice records). While criminologists disagree about which data is better, the two sources produce similar homicide rates. Chamlin & Cochrane (2006, p. 249) found a very strong correlation of 0.93 between the two measures, and analyses using one or the other tend to deliver similar conclusions. The main conclusion from quantitative research is that the more unequal countries tend to have the worst homicide rates (see LaFree, 1999; Nivette, 2011; Koepfel et al., 2015; Tuttle, 2022).

Alongside economic inequality, some studies have found a Latin America / Caribbean variable is a significant predictor of national homicide rates too (see, for example, Nivette's [2011] meta-analysis of existing empirical studies). Quantitative researchers usually attribute this variable's predictive power to issues concerning organised crime, cocaine, gang culture and gun use (see, for example, Malby, 2010). However, the relevant inter-group conflicts have been traced to the region's historical inequalities (see De Ferranti et al., 2004), and research on specific nations in the region has highlighted the interplay between contemporary structural inequalities, the cocaine trade, gang culture and the at times heavy-handed state 'war on drugs' responses, which can all contribute to high homicide rates (Durán-Martínez, 2018). Thus, the supposedly 'cultural' Latin America / Caribbean link to homicide is itself connected to inequality.

Quantitative analyses of homicide rates by both Paré & Felson (2014) and Pridemore (2011) controlled for poverty, which dramatically reduced the impact of inequality. However, both used a health outcome variable - infant mortality rates - as their proxy for poverty, as have

many other studies (see Koepfel et al., 2015; Kanis et al., 2017). The use of a *health outcome* variable is noteworthy, given the consensus among poverty experts that poverty means a *lack of material resources* (see above). While Paré / Felson and Pridemore did not reflect on how their chosen proxy related to different poverty definitions, Messner et al. (2010) - in a rare example of a criminological paper that engaged with poverty literature and referred to key poverty definition authors Sen (1983) and Townsend (1979) - found the correlation between infant mortality and relative poverty was stronger (0.74) than the corresponding correlation for absolute poverty (0.54). Thus, remarkably, the proxy that reduced the predictive power of inequality in Paré / Felson & Pridemore's studies is itself strongly linked to an inequality-based understanding of poverty. Furthermore, with so many empirical studies using infant mortality as a proxy for poverty (a recent example is Santos et al., 2018) and with infant mortality correlating quite strongly with *both* absolute and relative poverty, we are no nearer to discovering whether crime rates are more strongly associated with absolute poverty or relative poverty. The large-scale neglect of the meaning of poverty in criminological studies has led to all of this going unnoticed until now.

For crimes against individuals other than homicide, victim studies are now widely considered to provide more accurate and comparable international data than official statistics, as they avoid the major distortions caused by the under-reporting and under-recording of crime (see Maguire and McVie, 2017). Yet they are far from perfect. Even when standardised questionnaires are used across nations the meaning of words can differ in different languages, and people's willingness to reveal victim experiences to other household members or researchers can vary across cultures (see, e.g., Altbeker, 2005). Soares & Naritomi (2010) noted that poorer countries tend to have lower rates of recorded crime in general, in comparison with the amount found by victim studies. Hence, the rise of

victim studies seems to have reduced the popularity of the view that modernisation is criminogenic. However, the relationship between poverty rates and national crime rates remains clouded, despite analyses of data from the ICVS (1989-2010) project, which featured 74 countries in at least one of its surveys, and last featured a substantial number of countries in 2004/5. ICVS lead researcher Jan Van Dijk suggested inequality and poverty are “difficult to disentangle” because “income inequalities tend to be larger in poorer countries” (Van Dijk 2008, p. 105). This comment appears to overlook the availability of UN figures on both absolute and relative poverty. Moreover, while Van Dijk’s ICVS work does not address the meaning of poverty, he implies support for a definition that is closer to absolute than relative: Van Dijk (2007, p. 127) stated that the pattern of global regional crime victimisation “does not fully conform to the commonly held notion that levels of crime are driven by poverty”, as the “[crime] rate of the Eastern European countries [is] below that of Central and Western Europe”. This implies a rejection of a relative definition, as Eastern European countries, while poorer per capita, do not have noticeably high *relative* poverty rates. For example, in 2010, the year of the final ICVS surveys, relative poverty data for 23 OECD countries ranked five Eastern European countries among the 10 with lowest relative poverty rates and just four among the 10 with the highest¹. Importantly, ICVS data was not analysed in a way that connected it to available data on absolute poverty and relative poverty.

As with previous analyses of ICVS data, no analysis of Gallup World Poll (GWP) crime data has discussed poverty definition or focused on the possible relationship between poverty rates and crime rates. The GWP, which began in 2001 and has taken place in over 150 countries in recent years, features two crime victimisation questions. According to a recent analysis (Van Dijk et al., 2022), the data show that African and Latin American countries tend to suffer from the highest levels of various crimes, followed by countries in Asia, while

European, North American countries and Australia experience the lowest crime rates. This pattern points to higher crime rates in countries which suffer more absolute poverty, while the high figures for Latin America point to a role played by inequality or regional characteristics. As with the other data sources, and unlike the empirical project discussed later in this article, no GWP study on national crime rates has used absolute and relative poverty variables, and nor has any study anchored its discussion in those very different concepts.

Data and Methods

The main aim of the study was to map connections between absolute and relative poverty on the one hand, and national crime rates on the other; its main research question is: which is the better predictor of national crime rates, relative poverty or absolute poverty? The only available poverty data is supplied by the UN/World Bank's \$1.90 per day at 2011 prices and purchasing power parity (absolute) and '50% of median income' (relative) measures already described. For measures of national crime rates, the most reputable global data sources were chosen for all major crimes, and for the most recent year possible up to and including 2018. Hence, the study uses the 'country / years' favoured by Malby (2010) and Van Dijk et al. (2022); these authors recognise that national crime rates and other social indicators tend to be stable across years, and so they favour using 'country / years' to maximise the sample of countries. The year 2018 was chosen because it was the most recent source of complete data available at the time of the study; a vast majority of countries have data from 2018. To improve comparability of tests, the sample is restricted

to the 105 'country / years' that have no missing data on any of the variables to be included in the multivariate analysis.

All data used in this study are widely known, so in the following methodological discussion only essential relevant details are included, and the focus is on research decisions that were within the author's control.

The crime rate data

Homicide: In gathering the homicide rates per 0.1 million citizens used here, the United Nations Office for Drugs and Crime (UNODC, 2013, p. 9) defined intentional homicide as "unlawful death purposely inflicted on a person by another person" before clarifying that its UN figures exclude intentional killings by perpetrators of armed conflict. Here, UN criminal justice system data is favoured over WHO health systems data because the latter relies far more heavily on estimates rather than actual records (Kanis et al., 2017) and has been criticised for sometimes wrongly including unintended deaths (Schaible, 2012).

GWP victim surveys: Since 2001 Gallup World Polls (GWP) have surveyed representative samples of around 1000 people over the age of 18 in an overwhelming majority of the world's countries on various topics (further methodological details are available at the web site: <https://www.gallup.com/178685/methodology-center.aspx>). GWP surveys include the following two crime victimisation questions (shorthand terms used here are in brackets):

Within the past 12 months, have you been assaulted or mugged? (Assault /
Mugging)

Within the last 12 months, have you had money or property stolen from you or another household member? (Stealing)

Answer options for both questions are 'yes', 'no', and 'don't know'; 'don't know' responses are excluded from the analysis here due to being so few. The first question focuses on violence and the second is about the loss of property, but there is an overlap, as 'mugging' incurs a loss of property too.

WHO Intimate Partner Violence (IPV) against women estimates: The WHO now collates victim survey data in most of the world's countries to estimate the extent that women are victims of violence committed by a male intimate partner. Tausch (2019, p. 1157) found that such violence is illegal in "at least 144 countries". WHO estimates include only representative victim surveys carried out between 2000 and 2018 that included questions about violent acts (see WHO, 2021, pp. 11-18). The term Intimate Partner Violence (IPV) helps distinguish such acts from those committed against children and non-partners. The WHO's collation of data faced subject-specific problems such as definitional differences in the various victim surveys used, and the stronger taboo around disclosing such violence in some countries being likely to impact on findings (see WHO, 2021, pp. 9-10). Despite these clear limitations, the study represents an expert-led attempt to deliver the most internationally comparable data ever brought together on an important criminological topic. 'Past year' IPV estimates are used here (not 'lifetime' estimates) because they are less affected by cross-cultural variations in people's tendency to have multiple intimate partners.

The linear regression and its control variables

To aid comparability between tests, the sample of countries (105) used is the same for all regression models; any countries with missing values on any of the variables are excluded, which means that countries involved in more data gathering (which tend to be richer and more populous) are more likely to feature (see Appendix A). To further aid comparability, with a few exceptions (see below), models contain the same potential control variables. Cook's Distance scores of more than $4/n$ (in this analysis, $4/105 = 0.038$) are widely considered problematical (see Cook & Weisberg, 1982; Field, 2018, 422), so to ensure that the same countries feature in all models, the outcome variables were 'log-transformed' using the natural logarithm 'ln'. The overall level of multicollinearity in the models was always unproblematic (VIF was always comfortably >0.1 and <10 , which, for example, Myers, 1990, considers acceptable), and Durbin-Watson scores were all within the widely accepted range of 1.5 to 2.5. To improve comparability across the models for the various types of crime, the same predictor variables were used in models predicting the four crime rate outcomes – homicide (Model A1), assault / mugging (B1), stealing (C1), and IPV against women (D1). Alongside absolute poverty and relative poverty predictors (see the earlier discussion about the World Bank's measures of absolute poverty and relative poverty) three socio-economic development control variables were included, all of which have been used in earlier studies of crime rates around the world (see Koeppel et al., 2015). The three are now described:

Males (15-24): World Bank data on the percentage of a country's population that is male and 15-24 years of age is included not only because this group has, globally and across nations, a relatively high rate of criminal activity, but also because a high percentage in this category is indicative of a country being at a relatively early stage of modernisation.

Bad Governance simply reverses the World Bank's aggregated Worldwide Governance Indicators (WGI) scores. Scores are aggregated based on six dimensions of good governance, which are voice and accountability, political stability and the absence of violence / terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. Data are based on expert observations and public perceptions within countries, and they are derived from multiple sources (see Kaufmann et al., 2010, for more details). While the third of the six components listed includes 'violence', its meaning is distinct from the violence that features in some outcome variables in the present analysis, as it refers to "the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means" (Kaufman et al., 2010, p. 4).

Illiteracy Rate is emphasised in the civilisation thesis (Elias, 2000 [1939]; Pinker, 2011). To preserve sample size, countries that do not submit literacy data to the World Bank due to having very high rates were given an imputed illiteracy score of one per cent.

Real GDP per capita and the percentage of the population living in urban areas are the two other control variables sometimes favoured elsewhere (see Koepfel et al., 2015); the former was rejected on the grounds it correlated too strongly with absolute poverty (see above), while available data on the latter lacks a meaningful cut-off point that properly captures a level of industrial development.

In addition to the four models (A1, B1, C1 and D1) containing the same five predictors, three other models (A2, A3 and D2) also feature one or more of the following predictors, which have all been established in past empirical work as important correlates of a particular crime rate:

Latin/Caribbean region simply includes countries classed by the UN as being in that region.

It is included, for theoretical reasons already discussed, in models A2 and A3 that predict homicide rates. Indeed, it is a well-established variable in cross-national crime research (see, for example, Lafree & Tseloni, 2006; Nivette, 2011).

Civilian gun ownership is also included as a homicide predictor in Model A3, as it was estimated recently that 44 per cent of recorded homicides globally involved a firearm (Oberwittler 2019, p. 1). Figures used here are from the Small Arms Survey (see the 'Annexe' section of Karp, 2018) which estimates the number of firearms held by civilians per 100 citizens. The correlation between civilian gun ownership and homicide rates is statistically significant and strongest when the number of guns per 100 people reaches three, so the dichotomised variable used here splits at that point.

Gender Inequality: The World Economic Forum's (WEF) gender equality estimates are included in an IPV against women model (D2), as pursuing gender equality is widely considered to be key to minimising the problem (see, for example, Westmarland, 2015). This is purely a measure of the inequality between men and women in all aspects of life – not the 'absolute' lifestyle conditions faced by women. An index is calculated for each country based on four equally weighted criteria: health and survival, educational attainment, economic participation and opportunity, and political empowerment (see WEF, 2018, pp. 8-9).

Results

The results of bivariate tests involving *absolute* poverty are in Table 1a, while those for *relative* poverty are in Table 1b. For descriptive purposes, in these tables poverty rates are split into four categories that each include approximately a quarter of the countries in the study. All eight coefficients for linear associations (see the far-right columns of tables 1a and 1b) show a positive, statistically significant correlation between poverty and crime. The three highest correlation coefficient scores, all above 0.4, are for *absolute* poverty and crime. The correlations for absolute poverty and all crimes except homicide are stronger than corresponding correlations for relative poverty and the same crime (see Tables 1a and 1b). Yet despite homicide being more closely associated with relative poverty than absolute poverty, the only other of the four crimes that is exclusively about violence (IPV against women) is nevertheless the only one that has a correlation with absolute poverty (0.54) that is far stronger than its correlation with relative poverty (0.16). Furthermore, in Table 1a, while the IPV against women, assault / mugging and stealing rates in the countries with '15% and over' absolute poverty rates are all more than 1.5 times as high as the rates for the 1.5-14.9% category, the homicide rates are almost identical in these two poverty categories (11.5 and 11.6); thus, recorded figures for homicide are lower than might be expected (in view of the other three crime rates, which are, unlike homicide, all based on victim studies) in the countries most stricken by the harshest material conditions.

TABLES 1a and 1b HERE

Table 2 collates the main findings from the seven linear regression models (full details of all models are in Appendix C). Standardised Beta Coefficients (SBCs) show the relative size of

the 'impact' (though no causal links are claimed by the researcher) of predictor variables (which include absolute and relative poverty variables) on the outcome variables (crime rates). While SBCs from different regression models are not strictly comparable, they are presented together in Table 2 to illustrate the pattern of findings across the seven models.

TABLE 2 HERE

If we first focus on models A1, B1, C1 and D1, which all used the same three control variables (Males of 15-24 years, Bad Governance and Illiteracy), it is noteworthy that IPV against women (Model D1) is the only crime for which absolute poverty has a statistically significant association while relative poverty does not; the opposite is true for homicide and assault / mugging, as these crime rates are predicted by relative poverty but not absolute poverty (see models A1 and B1 in Table 2). Stealing (Model C1) occupies a unique position among the four models with the same predictors, as both relative and absolute poverty are significant predictors of it. For both acquisitive crimes (stealing and assault / mugging), relative poverty has a higher SBC than absolute poverty.

The inclusion of a Latin America / Caribbean variable as a homicide predictor in model A2 dramatically reduces the predictive power of relative poverty, from 0.38 (in Model A1) to 0.16 (in Model A2), while it makes absolute poverty statistically significant, albeit only at $P < 0.1$ (see Table 2). In both Models A2 and A3 (the latter includes civilian gun ownership alongside all Model A2's variables) the Latin America / Caribbean variable has the highest SBC of any predictor (0.48 in Model A2, and 0.46 in Model A3 – see Appendix C); these

findings are consistent with the possible view that a specific Latin America / Caribbean factor explains why the region's countries tend to exhibit particularly high homicide rates (see this article's earlier discussion). In Model A3, civilian gun ownership renders relative poverty insignificant as a predictor of homicide rates while increasing the SBC of absolute poverty to 0.23. Civilian gun ownership, an oft overlooked variable in cross-national homicide research, delivered an SBC of 0.25. Gender inequality did not correlate significantly with IPV against women when it was included in Model D2. Moreover, gender inequality did not reduce the predictive power of absolute poverty, which had an SBC of around 0.3 in both models D1 and D2, and nor did it impact on the predictive power of relative poverty, which remained an insignificant predictor in Model D2.

Discussion and Conclusion

Criminological work on the poverty-crime nexus has not been anchored in meaningful discussion about what the word poverty means. Hence, conclusions have been drawn about poverty and crime without any acknowledgement of whether the measures used are based on an absolute definition (which captures the objectively worst material conditions) or a relative one (which is closely linked to inequalities in the distribution of resources in a particular society, and which demarcates those who are poor in comparison with their nation's usual or average material standards). The poverty proxy most often used in criminological research on national crime rates - infant mortality – correlates quite strongly with *both* absolute and relative poverty, so existing findings are hard to interpret in relation to those two main, rival definitions of poverty. All cross-national analyses are limited by widely known problems, such as measurement variations between countries and a lack of

available data on less developed and less populous nations. A limitation of the research presented here is that its civilian gun ownership and IPV against women figures were merely estimates. Nevertheless, it provided a unique mapping of cross-national crime rates, absolute poverty rates and relative poverty rates using prestigious data sources, and it was flexible enough to include as many 'best available' recent crime rate estimates as possible.

Bivariate tests found that both absolute and relative poverty associated significantly with all four crime rates; therefore, the bivariate findings about absolute poverty are consistent with the claims made by some economists about crime being reduced by socio-economic development and Pinker's claim that such development reduces violence, while those on relative poverty are consistent with 'strain' type theories emphasising frustrations associated with relative deprivation and their effect on crime rates. More importantly, a finding from the multivariate analysis, that in Models B1 and C1 relative poverty was a significant predictor of acquisitive crimes, is consistent with 'strain'-based theories. Furthermore, the findings on the predictive power of absolute poverty in the homicide Model A3 and both models predicting IPV against women (D1 and D2) are consistent with not only Pinker's implied view that a reduction in absolute poverty precipitates a reduction in violence, but also some economists' view that greater prosperity disincentivises criminal behaviour.

In the bivariate analysis, all crimes except homicide had a stronger correlation with absolute poverty than they had with relative poverty; some might consider it anomalous that absolute poverty did not associate strongly with homicide rates, despite it being an important predictor of another form of violence - intimate partner violence against women. Linear regression analysis presented here suggests this discrepancy might be explained by

the impact of the Latin America / Caribbean region and civilian gun ownership variables, as both were significant predictors when they were included in Model A3, in which absolute poverty gained strength as a predictor of homicide while relative poverty was rendered insignificant. This relative poverty finding differs from the findings and conclusions of past multivariate work discussed earlier, which usually reported that economic inequality, a variable closely connected to relative poverty, is the strongest correlate of national homicide rates. However, inequality is relevant to the finding presented here, as historical inequalities have contributed to Latin America and the Caribbean's present-day social characteristics. The varying poverty-homicide results for Models A1, A2 and A3 are illustrative of a limitation of regression analysis – that findings and possible conclusions can depend on which predictor variables are chosen for inclusion in models. It is perhaps unsurprising that absolute poverty became a stronger predictor, and relative poverty less so, when a Latin America / Caribbean variable was included, as this study's 20 countries from that region, which have an average (mean) homicide rate of 19.3, compared with a mean of 4.1 for the other 85 countries ($P < 0.001$), have a low mean absolute poverty rate (4.7%, compared with 11.2% for the other 85, $P = 0.133$), and a high mean relative poverty rate (18.8%, compared with 11.9% for the other 85, $P < 0.001$)².

Low civilian gun ownership in the less socio-economically developed countries (see Appendix B) has sometimes been overlooked in discussions about poverty and homicide rates. The 32 countries with fewer than three civilian guns per 100 citizens had a mean absolute poverty rate of 21.4% - more than quadruple the 5.0% figure for the other 73 countries ($P < 0.001$); this pattern contrasts sharply with the corresponding figures for relative poverty (12.2% and 13.7%, which are not significantly different, even at $P < 0.1$). Those 32 countries with low civilian gun ownership have significantly higher rates of the

other three crimes that featured in the analysis presented here; estimated IPV against women has a mean of 15.1% victims in the last year, slightly more than double the 7.4% for the other 73 countries, and they have more assault / mugging (corresponding figures are 9.3% and 5.9%) and stealing (20.7%, 14.0%) too (all three correlations are significant at $P < 0.01$). Yet, conversely, those 32 countries' mean homicide rate is just 3.4 per 100000 citizens, compared with 8.6 for the other 73 ($P < 0.05$); consistent with Cohen and Felson's (1979) theorising, it appears that the opportunities provided by more widespread civilian gun ownership might explain why homicide is the only one of the four crimes that is more prevalent in those 73 countries.

While the characteristics of the Latin America / Caribbean region and patterns of civilian gun ownership might explain why absolute poverty did not correlate significantly with homicide rates when those two variables were absent from models, a further possible reason is that homicide data comes from crime records not victim surveys. If the implication of Van Dijk's (2008, p. 33, *emphasis added*) comment that "*Especially in the developed countries, the reporting and recording of homicide is close to 100%*" is true, this might help explain why countries with absolute poverty rates of 15% or more have lower homicide rates than might be expected in view of their homicide rates for the 1.5-14.9% category (see Table 1a). Lesser reporting and recording seems likelier in countries with higher absolute poverty rates due to their generally poor governance (see the correlation of 0.46 [$P < 0.001$] in Appendix B). For example, a country in which security forces commit numerous killings might be expected to under-record homicide, regardless of whether medical or criminal justice professionals are responsible for supplying the data (see Altbeker [2005] for a more detailed discussion). Perhaps future research might investigate the extent to which countries with high estimates

of killings by security forces have high levels of violence in general (using data from victim studies) compared with their official homicide rates.

Finally, despite the inevitable limitations of the research presented here, its finding that low absolute poverty usually correlates with low levels of various crimes nevertheless further bolsters the view that anyone still committed to portraying socio-economic development as generally criminogenic is misguided.

Notes

¹ The OECD data are available at <https://data.oecd.org/inequality/poverty-rate.htm>

² While it is conventional to refer only to other authors' published work in a 'Discussion and Conclusion', here, in the absence of relevant published findings, the author presents his own calculations using data from the same 105 countries that featured in the 'Results' section.

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Appendix A: Countries included the Bivariate and Multivariate analysis.

The 105 countries in the multivariate analysis

Albania	Argentina	Armenia	Australia	Austria
Azerbaijan	Bangladesh	Belarus	Belgium	Benin
Bhutan	Bolivia	Bosnia Herz.	Botswana	Brazil
Bulgaria	Burkina Faso	Burundi	Cameroon	Chile
Colombia	Costa Rica	Croatia	Czech Republic	Cyprus
Denmark	Dom Republic	Ecuador	Egypt	El Salvador
Eswatini	Ethiopia	Finland	France	Georgia
Ghana	Greece	Guatemala	Honduras	Hungary
Iceland	India	Iran	Ireland	Italy
Jamaica	Japan	Jordan	Kazakhstan	Kenya
Kyrgyz Republic	Latvia	Lesotho	Liberia	Lithuania
Luxembourg	Malawi	Maldives	Malta	Mexico
Mongolia	Montenegro	Mozambique	Myanmar	Namibia
Nepal	Netherlands	Nicaragua	Nigeria	N Macedonia
Norway	Pakistan	Panama	Paraguay	Peru
Philippines	Poland	Portugal	Romania	Rwanda
Senegal	Serbia	Sierra Leone	Slovak Republic	Slovenia
South Africa	Spain	Sri Lanka	Sweden	Switzerland
Tajikistan	Tanzania	Thailand	Trinidad & Tob.	Tunisia
Turkey	Uganda	Ukraine	United Kingdom	United States
Uruguay	Venezuela	Vietnam	Zambia	Zimbabwe

Appendix B: Correlation matrix for predictor variables in the linear regression models

	Absolute Poverty	Relative Poverty	Males 15-24 (%)	Illiteracy (%)	Bad Gov. Score	Latin America / Caribb	Gender Equality	Guns per 100 People
Absolute Poverty	1.00							
Relative Poverty	0.38***	1.00						
Males 15-24 (%)	0.60***	0.35***	1.00					
Illiteracy (%)	0.63***	0.02	0.62***	1.00				
Bad Governance	0.46***	0.21*	0.42***	0.52***	1.00			
Latin Am'ca/ Caribb.	-0.15	0.50***	-0.07	0.10	0.18	1.00		
Gender Inequal.	0.09	0.08	0.40***	0.47***	0.45***	0.08	1.00	
Guns per 100 people	-0.30**	0.05	-0.35***	-0.33**	-0.43***	-0.03	0.19	1.00

Note: *Sig.<0.05, **Sig.<0.005, ***Sig.<0.001; n=105.

Appendix C: Details of the linear regression models

A. Models predicting homicide (UN data)

A1. With Usual Predictors

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	-2.83	1.07	0.009	-	-4.95	-0.72
Absolute Poverty	-0.00	0.02	0.810	-0.03	-0.02	0.01
Relative Poverty	0.08	0.11	<0.001	0.38	0.05	0.12
Males 15to24	0.11	0.04	0.003	0.37	0.04	0.19
Bad Governance	0.05	0.02	0.049	0.19	0.00	0.09
Illiteracy	-0.01	0.01	0.109	-0.17	-0.03	0.00

A2. Predictors including Latin America / Caribbean Region

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	-0.98	0.43	0.024	-	-1.82	-0.13
Absolute Poverty	0.01	0.01	0.065	0.18	0.00	0.03
Relative Poverty	0.04	0.02	0.046	0.16	0.00	0.07
Males 15-24	0.07	0.03	0.043	0.23	0.00	0.13
Bad Governance	0.03	0.02	0.088	0.15	-0.01	0.07
Illiteracy	-0.01	0.01	0.104	-0.16	-0.03	0.00
Latin-Am/Carib	1.40	2.44	<0.001	0.48	0.92	1.89

A3. Predictors including Latin America / Caribbean region and Civilian Gun Ownership

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	-1.60	0.45	<0.001	-	-2.49	-0.71
Absolute Poverty	0.02	0.01	0.016	0.23	0.00	0.03
Relative Poverty	0.02	0.02	0.164	0.11	-0.01	0.06
Males 15-24	0.08	0.03	0.040	0.27	0.02	0.14
Bad Governance	0.04	0.02	0.024	0.19	0.01	0.08
Illiteracy	-0.01	0.01	0.202	-0.12	-0.02	0.01
Latin-Am/Carib	1.34	0.23	<0.001	0.46	0.88	1.81
>3 Civilian Guns	0.62	0.19	0.001	0.25	0.25	0.95

B. Model predicting assault / mugging (Gallup data)

B1. With Usual Predictors

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	-0.26	0.25	0.314	-	-0.76	0.24
Absolute Poverty	0.01	0.00	0.133	0.13	0.00	0.01
Relative Poverty	0.06	0.01	<0.001	0.38	0.04	0.08
Males 15to24	0.06	0.02	0.011	0.26	0.01	0.10
Bad Governance	0.01	0.01	0.622	0.04	-0.02	0.03
Illiteracy	0.02	0.01	0.002	0.29	0.01	0.02

C. Model predicting stealing (Gallup data)

C1. With Usual Predictors

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	-1.31	0.20	<0.001	-	0.91	1.71
Absolute Poverty	0.01	0.00	<0.001	0.32	0.01	0.02
Relative Poverty	0.04	0.01	<0.001	0.35	0.02	0.05
Males 15to24	0.04	0.02	0.013	0.27	0.01	0.08
Bad Governance	-0.01	0.01	0.652	-0.04	-0.02	0.02
Illiteracy	0.00	0.00	0.251	0.11	0.00	0.01

D. Models predicting intimate partner violence (IPV) against women (WHO data)

D1. With Usual Predictors

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	0.76	0.19	<0.001	-	0.37	1.14
Absolute Poverty	0.01	0.00	<0.001	0.30	0.01	0.02
Relative Poverty	0.00	0.01	0.827	-0.01	-0.02	0.01
Males 15to24	0.05	0.02	0.003	0.29	0.02	0.08
Bad Governance	0.04	0.01	<0.001	0.27	0.02	0.06
Illiteracy	0.01	0.00	0.071	0.15	0.00	0.01

D2. Predictors including Gender Inequality

	Estimate	Standard Error	Sig.	Standardised Beta Coefficients	95% Confidence Intervals (for Estimate)	
Intercept	0.56	0.30	0.068	-	-0.04	1.16
Absolute Poverty	0.01	0.00	<0.001	0.32	0.01	0.02
Relative Poverty	0.00	0.01	0.905	-0.01	-0.02	0.01
Males 15to24	0.05	0.02	0.003	0.29	0.02	0.08
Bad Governance	0.03	0.01	0.004	0.24	0.01	0.05
Illiteracy	0.01	0.00	0.170	0.12	0.00	0.01
Gender Inequality	0.76	0.91	0.403	0.06	-1.04	2.56

Table 1A: Absolute Poverty and Average (Mean) Crime Rates

Crime (and source of crime data)	Absolute Poverty rate (proportion of nation's population living on <\$1.90 per day at 2011 prices, PPP)					Kendall's Tau Correlation Coefficients (for linear association)
	<0.5%	0.5-1.4%	1.5-14.9%	15%+	TOTAL	
Homicide (UN)	2.3	2.7	11.5	11.6	7.0	0.33***
Assault / Mugging (Gallup)	4.0	3.6	7.4	13.3	7.0	0.48***
Stealing (Gallup)	10.5	11.4	16.9	26.8	16.0	0.42***
IPV against women (WHO)	5.5	6.9	9.5	18.5	9.7	0.54***

Notes: figures are for 2018 or the nearest available year; *Sig.=<0.05, **Sig.<0.005, ***Sig.<0.001; Homicide units = 'crimes per year per 100000 population' for Homicide; all others are percentage victimisation rates in the last year, n=105.

Table 1B: Relative Poverty rates and Average (Mean) Crime Rates

Crime (and source of crime data)	Relative Poverty rate (proportion of nation's population living on <50% of median national income)				TOTAL	Kendall's Tau Correlation Coefficients (for linear association)
	<10%	10-12.4%	12.5-17.4%	17.5%+		
Homicide (UN)	2.1	2.2	9.3	14.4	7.0	0.37***
Assault / Mugging (Gallup)	4.1	6.9	7.6	9.7	7.0	0.38***
Stealing (Gallup)	10.8	16.0	17.3	20.8	16.0	0.35***
IPV against women (WHO)	8.3	10.7	9.3	10.9	9.7	0.16*

*Notes: figures are for 2018 or nearest year; *Sig.<0.05, **Sig.<0.005, ***Sig.<0.001; units are 'crimes per year per 100000 population' for Homicide; all others are victimisation rates in last year, n=105.*

Table 2: Standardised Beta Coefficients (SBCs) for Absolute Poverty and Relative Poverty Predictors in the Linear Regression Models

Crime (and source of data)	Model Number & Other Control Variables (in addition to Males 15-24, Bad Governance, and Illiteracy Rate)	Absolute Poverty	Relative Poverty
Homicide (UN)	A1.	-0.03	0.38***
	A2. Latin/Caribbean	0.18*	0.16**
	A3. Latin/Car. & Civ. Guns 3+per100	0.23**	0.11
Assault / Mugging (GALLUP)	B1.	0.13	0.38***
Stealing (GALLUP)	C1.	0.32***	0.35***
IPV against women (WHO)	D1.	0.30***	-0.01
	D2. Gender Inequality	0.32***	-0.01

*Notes: number of countries=105; *Sig.<0.1, **Sig.<0.05, ***Sig.<0.005; more details of all models are in Appendix C.*