Cross-national and multilevel correlates of partner violence: an analysis of data from population-based surveys

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Title: Exploring cross-national and multi-level correlates of partner violence: A test of the gender hypothesis

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ABSTRACT:

Background: On average, intimate partner violence (IPV) affects nearly one in three women globally within their lifetime. But the distribution of partner violence is highly uneven with less than 4% of women experiencing IPV in the last 12 months in many high income countries compared to 40% or more of women in some low income settings. Little is known about the factors that drive the geographic distribution of partner violence, or how macro-level factors may combine with individual-level factors to affect individual women's risk.

Methods: We compiled data on the 12-month prevalence of partner violence, from 66 surveys (88 survey years) from 44 countries, representing 481,205 women. Only surveys using comparable questions and state of the art methods for ensuring safety and encouraging violence disclosure were used. Using linear and quantile regression, we examined associations between macro-level measures of socio-economic development, women's status, gender inequality, and gender-related norms and the prevalence of current partner violence at a population level. Multi-level modelling and tests for interaction, were used to explore whether and how macro-level factors influence individual-level risk.

Findings: Gender-related factors at the national and sub-national level help predict the population prevalence of physical and sexual partner violence within the last 12 months. Especially predictive of the spatial distribution of partner violence are norms related to male authority over female behavior, norms justifying wife beating, and the degree to which law and practice disadvantage women compared to men in access to land, property and other productive resources. The strong negative association between current partner violence and GDP per capita becomes non-significant in the presence of norm-related measures.

Interpretation. The association between level of economic development and prevalence of current IPV likely reflects differences in the acceptability of partner violence and in women's access to resources rather than GDP *per se.*

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Introduction

Intimate partner violence (IPV) is both an abuse of women's human rights and a profound health problem that saps women's energy and interferes with their full participation in society and their countries' social and economic development.

While violence touches many women's lives, it does so unevenly. Research demonstrates that there are vast differences in the levels of violence across setting, both between countries, within countries, and across neighbourhoods and regions. The 12 month prevalence of partner violence (using similar questions and methodologies) varies from 4 percent in countries such as Denmark, Great Britain, Ireland, and the United States to over 40% of women in some lower income countries.*[1–5] Even between neighbourhoods in a city or villages in a district, levels of partner violence often vary several fold.[6]

This raises a critical question: What accounts for these differences in levels, and can the spatial distribution of violence yield insights useful for violence prevention?

The geography of partner violence

Feminists have long contended that the primary drivers of partner violence are gender-related norms and hierarchies that shape relationships between men and women and structure women's access to resources[7]. These factors combine with genetic predispositions, developmental pathways, and partner- and relationship-related factors to determine the likelihood that an individual couple will experience violence and to drive the overall level of partner violence in a setting. Feminist-informed theory acknowledges the role of individual life-course factors, but also highlights the importance of community and macro-level factors as fundamental in defining levels of abuse.[8]

Research on violence, however, has largely ignored the role of macro-level factors in influencing women's risk of violence and the spatial distribution of abuse. Violence research is dominated by studies from North America and other high-income settings and these have emphasized the role of personality and relationship dysfunction, childhood trauma and developmental adversity, and anti-social behaviour as key risk factors for partner violence[9,10,11]. Efforts among US researchers to test the feminist hypothesis on the importance of gender norms and hierarchies at a state level have yielded equivocal results,[12] leading many Western academics to argue that gender plays a minor role in the aetiology of abuse.[13,14]

The goal of this paper is thus two-fold: 1) to test the gender hypothesis by evaluating the degree to which macro-level factors related to women's status, gender inequalities, and norms of male authority and control are associated with population-levels of partner violence; and 2) to explore whether these

* *In the WHO Multi-country Study on Women's Health and Domestic Violence (hereafter, known as the WHO Study), reports of current abuse by a partner varied from less than 4% in Yokohama, Japan and Belgrade, Serbia to 53.7% in rural Ethiopia and 34.2% the Peruvian department of Cuzco. The average 12 month prevalence of partner violence across the 28 states of the European Union is also 4%.[1]

factors interact with individual-level variables to predict women's personal risk of partner violence. Specifically we examine 4 questions:

- Do macro-level gender variables correlate with the geographic distribution of partner violence in the directions feminist-informed theory would suggest?
- What best accounts for the apparent association between a country's level of socio-economic development and its overall prevalence of current partner violence?
- Which factors remain important at the macro level when analysed in the presence of other macro- and individual level predictors of violence?
- Are there important cross-level interactions between macro and individual-level factors that influence a woman's personal risk of partner violence?

The analysis builds upon and extends what is a relatively undeveloped literature on macro-level predictors of population prevalence of violence against women. To date there have been only 8 studies that have sought to explore country or state level predictors of partner violence and all have methodological weaknesses, especially with respect to the outcome variable employed.[12,15,16,17,18,19,20,21] One[20] derives a numerical measure of partner violence based on qualitative descriptions in human rights reports and the remainder rely on data from a range of studies that used different definitions and measures of IPV. Our analysis is the first to analyse macro level predictors of partner violence at the country and survey year-level using highly comparable outcome data.

Data and Methods

Our analysis draws on multiple sources of data including: 1) 54 separate Demographic and Health Surveys (DHS) conducted between 2000 and 2013 2) 15 population-based surveys representing 10 countries collected between 2000 and 2014 as part of the WHO Multi-country Study of Domestic Violence and Women's Health (here after the WHO Study); 2 national replication studies of the WHO Study (Turkey and New Zealand); and a national-level survey of partner violence from Germany that used similar measures and methods.[22] Prevalence surveys were selected for their comparability in terms of violence questions, methods, and ethical controls, based on the authors' knowledge of the field. All told, our sample includes 66 surveys and 88 survey years from 44 countries, representing 481,205 women. When including only surveys that do not have any missing values on our exposure variables, we have 30 countries and 56 survey years. Surveys are defined as a combination of country and year, because some countries have more than one survey. The distribution of surveys by country is shown in Web-Appendix 1.

In addition, we used national level statistics compiled by the United Nations, the World Bank, and the Organisation for European Co-operation and Development (OECD), as well as topic-specific data sets compiled by academic institutions to track specific issues, such as women's economic and political rights. These institutions routinely collect and/or make available country level data on the economy, employment, education, health and other national level statistics compiled by governments.

<u>Outcome Variable</u>

The outcome variable for this analysis is the population prevalence of *current partner violence*, defined as the percentage of ever-partnered women (minus widows without a current partner) 15 to 49 who experienced at least one act of physical and/or sexual violence within the past 12 months.

Both the DHS and WHO studies use in-person household surveys to interview a representative sample of women 15 to 49, either nationally (in the case of the DHS and the WHO surveys conducted in Samoa and Turkey) or sub-nationally in the remaining WHO surveys. Both surveys used behaviourally specific questions about different acts of physical and sexual partner violence. Although wording on acts differs slightly in some surveys, the variations are minor. All surveys followed similar ethical guidelines designed to maximize safety and disclosure, including interviewing only one woman per household, maintaining complete privacy during the interview, and implementing specialized sensitivity training for interviewers. [23,24]

Our analysis focuses on past year partner violence to address differences in inclusion criteria between the DHS and WHO. The DHS restricts itself to violence perpetrated by a woman's current or most recent partner, whereas the WHO study asks about violence perpetrated by *any* partner since the age of 15. By focusing on the previous 12 months, we maximize comparability between surveys. Moreover, it makes conceptual sense to compare how current macro level factors affect present day rates of partner violence.

Exposure Variables

Our exposure variables represent a variety of gender-related domains, as well as control variables that offer alternative explanations for the spatial distribution of violence. The gender-related domains include women's status; women's economic participation and entitlements, women's political participation and entitlements, gender inequality between men and women; and gender-related norms and attitudes. In addition we include variables to control for a country's level of socio-economic development (natural log of GDP in purchasing power parity in 2011 constant $) and the age structure of the population.

Table 1 summarises the individual data sources and variables used to represent each domain. All macro-level variables represent the mean level of that measure aggregated at the survey level (if derived from surveys) or a national level measure, if taken from data banks maintained by multi-lateral agencies, such as the World Bank. Several of the indicators represent specialised indices of entitlements and/or discrimination created by academics or global institutions to track gender-related trends. These include measures on women's political and economic rights from the Cingranelli and Richards (CIRI) Human Rights Data Base (e.g. Women's *de jure* and *de facto* economic entitlements) and two measures of gender inequality in family law and ownership rights created, maintained by the OECD as part of its Social Institutions and Gender Index (SIGI) data base. In both indices, 2 experts independently assign scores to countries based on data from the US State Department's *Country Reports on Human Rights Practices,* according to a detailed coding scheme. The SIGI family law index, for example, assesses the degree to which state's discriminate against women in issues of child guardianship and custody, access to divorce, the minimum legal age of marriage, and the right to inherit property. Values range from 0 (no discrimination between men and women in law and practice) to 1 (high discrimination between men and women).

Macro-Level Construct	Definition	Data Source(s)
Women's empowerment		
Educational achievement	Proportion of women 15 to 49 completing secondary education	Calculated from individual surveys
	Proportion of women in tertiary education	World Bank gender statistics data base
Early marriage	Proportion of women ages 20 to 24 married before age 18	Table 9 of the State of the World's Children 2011; data from DHS, UNICEF's Multiple Indicator Cluster Surveys (MICS) and other national surveys. Data for Germany, Japan and New Zealand from World Marriage Data Sheet 2008
Women's economic participation and entitlements		
Women's economic rights (0=no rights; 3=high *de-facto* rights	Specialised measure that codes the degree to which law recognises women's economic rights and governments enforce them	Women's economic rights and entitlements (WECON) measure from Cingranelli-Richards (CIRI) Database on Human Rights
Women working for cash	Proportion of women 15 to 49 who work for cash	Calculated from individual surveys
Participation in formal employment	Percentage of women engaged in wage and salaried work	World Bank gender statistics data base
Women's political participation and entitlements		
Women's political rights (0=no rights; 3=high *de-facto* rights)	Specialised measure that codes the degree to which law recognises women's political rights and governments enforce them	Women's political rights (WOPOL) measures of the Cingranelli-Richards (CIRI) Database on Human Rights
Women's political participation	Share of women in national parliaments	World Bank gender statistics data base
Level of gender inequality		
Relative access to secondary education	Ratio of married women to married men completing secondary education	Calculated from individual surveys
Relative enrolment in tertiary education	Ratio of female to male gross tertiary enrolment	World Bank gender statistics data base based on UNESCO data
Earned income ratio (coded 0 to 1)	Ratio of estimated female income compared to men's	World Bank gender statistics data base
Discrimination in ownership index	Measure that codes women's vs men's legal and de facto rights with respect to owning land, accessing credit (e.g. bank loans) and owning property other than land (e.g. a house).	Sub-index on "ownership" of the Social Institutions and Gender Index (SIGI), published by the OECD Development Centre
Discrimination in family law	Specialised measure that codes women's legal and de-facto rights with respect to marital regimes, child custody and inheritance	Sub-index on "family law" of the Social Institutions and Gender Index (SIGI), published by the OECD Development Centre
Gender related norms		
Acceptance of wife abuse	Survey mean of women agreeing with at least one of six justifications for a man to beat his wife	Calculated from individual surveys
Male authority and control	Survey mean of women reporting that their partners exhibit one or more of five controlling behaviours	Family Code sub-index of the Social Institutions and Gender Index (SIGI), published by the OECD Development Centre
Other variables		

Level of socio-economic development	Natural log of GDP per capita in purchasing power parity ($2011)	World Bank gender statistics data base

For each explanatory variable tested, we used data from the same year that the violence survey was undertaken. Where an exact match was not available, the closest year to the survey date was used, giving priority to data collected prior to the date of the violence survey.

Statistical Analysis

This paper uses a variety of different techniques to address our different research questions.

Scatterplots, histograms, and linear and quantile regression were used to assess normality, identify outliers, and examine the potential associations between macro level explanatory variables and the levels of partner violence at a country and survey level. The goal of this bivariate ecological analysis was to assess whether the population-level distribution of partner violence is associated in the predicted direction with macro-level variations in women's status, gender inequality, and norms related to male authority and control. Quantile regression was used to check the robustness of our findings. Because it models the median rather than the mean, quantile regression generally yields more accurate coefficients for skewed data sets, with fewer covariates emerging as significant. It also can be used to assess whether a covariate exerts a differential effect at low versus high ends of an outcome distribution.[25]

Next we run the same ecological analysis with multiple variables. Standard errors are clustered at the country level to take into account that some countries have multiple surveys and therefore their observations are not fully independent. For this analysis we use linear rather than quantile regression.

Our strategy for model building was to determine which variable from each domain dominated when considered together with the other variables selected to represent that domain. We selected the most robust measure for each domain, and then ran a set of structured regressions to determine whether the apparent association between a country's aggregate level of GDP per capita and its level of partner violence, persisted in the presence of gender-related variables. All models include year fixed effects. Robust p values are provided in parentheses.

Multi-level analysis was used to examine whether the macro-level variables associated with the spatial distribution of partner violence were primarily a function of the characteristics of the individuals living there (a compositional effect) or reflected a higher order social process (a contextual effect). When we include the same variable at both levels, we essentially test whether there is an extra correlation between the macro factor and abuse over and above that operating at the individual level.

Finally, we explore potential cross-level effects by testing for interaction between macro- and individual-level variables. To simplify interpretation of these findings we present split samples that examine the effects of the individual-level variables in countries with high versus low acceptance of partner violence. Examining such split samples is equivalent to including the macro variable in question as well as that variable interacted with all individual level variables and year dummies.

All analysis was performed using STATA version 13.1.[26]

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Results

Table 2 summarises the bi-variate associations between gender-related macro factors and the geographic distribution of partner violence. As indicated by the arrows, all of the ecological associations are in the direction that feminist-informed theory would predict with the exception of early marriage, the ratio of girls to boys who complete secondary school and the ratio of earned income between men and women, which do not reach statistical significance. In addition to being associated with women's status and other gender-related variables, levels of partner violence appear lower in high income countries. For every log increase in GDP per capita, the prevalence of partner violence declines 5.5%. These findings are robust to quantile and logistic regression and are largely similar in urban and rural samples (see Web-Appendix 2).

Table 2. Bivariate associations between gender-related macro factors and mean levels of current partner violence (N= 88 survey years)

Women's status	***Coef (p value)***	**Predicted direction**	**Actual Direction**
Secondary school Completion	-0.004* (0.062)	↓	↓
Enrolled in tertiary Education	-0.202** (0.023)	↓	↓
Early marriage (2009)	0.214 (0.127)	↑	*Ns*
Economic participation and entitlements			
Economic rights	-0.056** (0.036)	↓	↓
Working for cash	-0.306** (0.040)	↓	↓
Formal employment	-0.007*** (0.000)	↓	↓
Political participation and entitlements			
Political rights	0.071 (0.316)	↓	*Ns*
Political participation	-0.009*** (0.000)	↓	↓
Level of gender inequality			
F/M ratio secondary school (in girls favour)	-0.096 (0.260)	↓	*Ns*
F/M ratio tertiary education	-0.002** (0.032)	↓	↓
M/F ratio earned income (in boys favour)	0.139 (0.243)	↑	*Ns*
Gender inequality in ownership	0.271*** (0.000)	↑	↑
Gender inequality in family law	0.044** (0.025)	↑	↑
Gender related norms			
Norms justifying wife beating	0.263*** (0.000)	↑	↑
Norms of male authority/control	0.102*** (0.000)	↑	↑
Other variables			
Socio-economic development	-0.055*** (0.009)	↓	↓

Table 3 explores alternative explanations for why reductions in violence might accompany socio-economic development. The negative coefficient for GDP per capita (-0.055 p=0.009) in Column 1 confirms that the level of current partner violence decreases as the level of GDP increases. We hypothesized that GDP is actually a marker for more complex social processes and transformations in women's roles that frequently accompany economic growth and "modernization". Consistent with this theory, Column 2 and 3 shows that the correlation between GDP and partner violence decreases and becomes non-significant as we add in norms related to wife beating and male authority/control over women. Columns 4 through 6 examine whether age structure, level of education or proportion of women working for cash could instead be responsible for the apparent association between norms and violence; but the ecological association remains statistically significant in the presence of these additional controls.

Table 3. Multivariate analysis of GDP per capita, gender norms and ownerships rights adjusted for population structure in terms of age, education and working for cash

VARIABLES	(1) Abused	(2) Abused	(3) Abused	(4) Abused	(5) Abused	(6) Abused	(7) Abused	(8) Abused
Norms justifying wife beating		0.183**	0.147***	0.164***	0.165***	0.146**	0.079	0.087
		(0.010)	(0.008)	(0.007)	(0.008)	(0.026)	(0.219)	(0.151)
Norms of male authority			0.084***	0.078***	0.078***	0.087***	0.094***	0.095***
			(0.002)	(0.007)	(0.009)	(0.004)	(0.001)	(0.001)
Ln GDP per capita	-0.055***	-0.034**	-0.015	-0.009	-0.010	-0.005	0.011	0.010
	(0.009)	(0.037)	(0.472)	(0.686)	(0.666)	(0.849)	(0.641)	(0.670)
Age 15 to 24				-0.077	-0.068	-0.077	-1.056	-0.826
				(0.817)	(0.849)	(0.873)	(0.132)	(0.245)
Age 25 to 34				0.583	0.588	0.596	-0.556	-0.285
				(0.234)	(0.230)	(0.214)	(0.477)	(0.697)
Less than 8 years education					-0.007	-0.020	0.041	-0.009
					(0.903)	(0.826)	(0.791)	(0.948)
8-11 years education					0.003	-0.020	-0.027	-0.133
					(0.966)	(0.880)	(0.873)	(0.420)
Women working for cash						-0.104	-0.007	-0.029
						(0.467)	(0.966)	(0.841)
Discriminatory ownership Rights							0.313***	
							(0.006)	
Unequal access to land								0.134*
								(0.055)
Unequal access to credit								-0.011
								(0.867)
Unequal access to property								0.128*
								(0.066)
Constant	0.686***	0.514***	0.217	0.042	0.050	0.036	0.471	0.380
	(0.000)	(0.001)	(0.263)	(0.901)	(0.887)	(0.915)	(0.139)	(0.264)
Observations	88	80	64	64	64	63	56	56
R-squared	0.291	0.473	0.585	0.598	0.598	0.584	0.692	0.717

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level. *** p<0.01, ** p<0.05, * p<0.1

Likewise, in columns 7 and 8 we explore the association between discrimination in women's ownership rights and levels of current partner violence. The presence of ownership laws and practices that privilege men over women are robustly and significantly associated the higher levels of violence (0.313 p=0.006)). Indeed, the SIGI ownership index appears to be the strongest predictor of aggregate levels of partner violence among all variables in the gender inequality domain. Column 8 breaks the index down into its component parts; here only women's access to land and other property are

statistically significant, suggesting that it is ownership of assets rather than access to credit or banking that drives the association. Additional analysis on urban versus rural samples, further suggest that it is inequality in ownership rights among rural women that mostly accounts for the association present at a country level (see web-appendix 2).

Next we repeat the above analysis using multi-level regressions. Multi-level coefficients represent the risk of partner violence to individual women in the presence of macro-level factors (see Table 4). The advantage of multi-level regressions over ecological associations, is that they demonstrate how factors are important at different levels in the social ecology. Column 1 and 2, which include individual-level variables for age and education demonstrates that completing secondary education and being over 34 significantly reduce women's risk of experiencing current partner violence (-0.049 p=0.001 and -0.080 p=0.007). Living in countries or regions where acceptance of wife beating and male authority are high remains significant at the 10% level in the presence of these compositional controls.

Table 4: Multi-level analysis of gender norms and ownership rights

VARIABLES	(1) Abused	(2) Abused	(3) Abused	(4) Abused	(5) Abused	(6) Abused
Survey level variables						
Ln GDP per capita	0.002	0.010	-0.002	-0.007	0.019	0.004
	(0.922)	(0.686)	(0.936)	(0.748)	(0.335)	(0.809)
Norms justifying wife beating	0.118**	0.108*	0.067	0.075	-0.058	-0.029
	(0.047)	(0.063)	(0.200)	(0.175)	(0.369)	(0.588)
Norms of male authority/control	0.062*	0.060*	-0.023	-0.028	0.006	-0.019
	(0.067)	(0.073)	(0.423)	(0.357)	(0.803)	(0.353)
Women working for cash				0.073	0.173	0.137
				(0.660)	(0.173)	(0.231)
Discriminatory ownership rights					0.281***	
					(0.001)	
Unequal access to land						0.132**
						(0.015)
Unequal access to credit/banking						-0.084
						(0.205)
Unequal access to property						0.155***
						(0.003)
Individual level variables						
Attitudes accepting violence			0.046***	0.046***	0.047***	0.047***
			(0.000)	(0.000)	(0.000)	(0.000)
Partner control			0.079***	0.079***	0.080***	0.080***
			(0.000)	(0.000)	(0.000)	(0.000)
Age 25 to 34	-0.012	-0.008	-0.004	-0.004	-0.002	-0.003
	(0.127)	(0.355)	(0.669)	(0.681)	(0.832)	(0.744)
Age > 34	-0.051***	-0.049***	-0.043***	-0.043***	-0.039**	-0.041**
	(0.000)	(0.001)	(0.007)	(0.007)	(0.022)	(0.015)
8-11 years education		-0.029	-0.016	-0.016	-0.014	-0.017
		(0.211)	(0.423)	(0.416)	(0.484)	(0.381)
> 11 years education		-0.080***	-0.048*	-0.048*	-0.044*	-0.046*
		(0.007)	(0.053)	(0.054)	(0.063)	(0.056)
Constant	0.046	0.000	0.095	0.117	-0.241	-0.014
	(0.849)	(0.999)	(0.655)	(0.572)	(0.247)	(0.930)
Observations	366,771	366,670	351,071	349,914	341,381	341,381
R-squared	0.020	0.024	0.123	0.122	0.130	0.132

Column 3 demonstrates that women who justify wife beating and who themselves have a controlling partner are at significantly higher risk of violence at the bi-variate level (not shown) and in multi-level analysis (0.046 p<0.001 and 0.079 p<0.001). Macro level norms of acceptance and male authority are no longer significant in the presence of these individual level factors, but they may be on the causal pathway between norms and IPV. Columns 5 and 6 demonstrate that living in a country that discriminates against women in access to land and other property remain strong factor for abuse (0.132 p=0.015 and 0.155 p=0.003) even in the presence of a range of individual factors.

Table 5 splits the sample between surveys in countries with high acceptance of partner violence (column 1) and lower acceptance of violence, illustrating potential cross level interactions. High is defined as above the median of the survey mean of those accepting at least one justification for wife beating. This table demonstrates that the level of overall acceptance of violence affects the impact of individual age and education-related variables on women's risk of partner violence. The coefficient for education is greater in settings with high acceptance compared to lower acceptance of violence, suggesting that education is more protective in countries or regions where justification of wife beating is greater. Being in the age range of 15 to 24 is also more risky in countries with high acceptance of violence (the p-value of the difference is 0.064 for being 25 to 34 years old compare to under 25). All interaction p values are available in Web-appendix 4.

Columns 3 and 4 instead splits the samples into surveys with very high and very lower mean acceptance of wife beating, defined as being above the 80th percentile (where more than 48% of survey respondents accept violence) and below the 20th percentile (where less than 6% do). In countries with very low acceptance, a woman's education, age and whether she works for cash make no difference to her risk of partner violence, but education and older age are protective in high acceptance settings. Individual acceptance of violence is much more strongly associated with being abused in areas with where partner violence is highly normative than where it is not (p value of difference is 0.004). This suggests an interaction between norms condoning violence and individual attitudes. By contrast, having a controlling partner appears slightly more dangerous in settings with very little acceptance of violence compared to where partner violence is normative (0.090 p=0.007) compared to 0.070 p<0.001).

Web-appendix 5 repeats the same analysis for surveys where many versus few women work. Here working for cash increases women's risk of partner violence substantially more in settings where few women work than where many women work (0.028 p<0.001 in surveys in the lowest 20th percentile of women working versus (0.016 p=0.076) in surveys in the top 80th percentile of women working). Likewise schooling is much more protective in settings with the lowest share of women working (bottom quintile) compared to the highest quintile (-0.130 p<0001 vs. -0.042 p=0.073).

Table 5. Cross level effect of individual risk factors for IPV in high versus low acceptance settings

VARIABLES	(1) High (above median) acceptance of violence	(2) Low (below median) acceptance of violence	(3) Very high (80percentile) acceptance of violence	(4) Very low (20 percentile) acceptance of violence
Attitudes accepting of violence	0.044***	0.047***	0.059***	0.029**
	(0.000)	(0.000)	(0.000)	(0.016)
Partner control	0.070***	0.083***	0.070***	0.090***
	(0.000)	(0.000)	(0.000)	(0.007)
Working for cash	0.008	0.015*	0.005	0.012
	(0.510)	(0.084)	(0.607)	(0.219)
Age 25 to 34	0.008	-0.019*	-0.004	-0.013
	(0.437)	(0.089)	(0.575)	(0.473)
Age > 34	-0.041**	-0.053**	-0.059***	-0.047
	(0.043)	(0.041)	(0.002)	(0.242)
8-11 yrs education	-0.057**	-0.002	-0.052**	-0.012
	(0.017)	(0.871)	(0.012)	(0.559)
> 11 years education	-0.087***	-0.029**	-0.085***	-0.034
	(0.006)	(0.041)	(0.000)	(0.287)
Constant	0.101***	0.032	0.106***	0.021
	(0.000)	(0.281)	(0.000)	(0.647)
Observations	161,194	187,728	57,366	84,571
R-squared	0.106	0.151	0.111	0.206

Note: mean acceptance of violence at median is 42% in columns 1 and 2; 48% in highest quintile (column 3) and 6% in lowest quintile (column 4).

Discussion

Our analysis suggests that gender-related factors at the country and regional level help predict the population prevalence of current partner violence (physical or sexual violence in the last 12 months). This includes factors related to women's status, such as educational achievement, as well as women's access to cash via employment and their *de jure* and *de facto* economic rights. Especially predictive of the spatial distribution of partner violence are norms related to male authority over female behavior, norms justifying wife beating, and the degree to which law and practice disadvantage women compared to men in access to land, property and other productive resources. The level of gender-related discrimination in family law, including differential rights to child custody, to inherit land and money, and to marry and divorce, also predict levels of partner violence across settings. Collectively, these associations provide suggestive empirical support for the gender hypothesis.

We likewise find that despite the strong and consistent negative association between GDP per capita and level of partner violence, level of socio-economic development is unlikely to be causally related to IPV prevalence. Rather it appears that GDP per capita is a marker for other social processes that often accompany socio-economic development. These include erosion of the belief in male superiority, entry of women into the paid labor force, and increased access to education and economic assets for women. It could be that more gender equitable norms naturally emerge as values shift from survival issues to greater emphasis on self-actualization, individualism and innovation, as

modernization theorists contend.[27] Or it could be that norms shift in the face of women's emancipatory demands and widespread entry into the paid labor force.[28]

Contrary to our expectations, levels of partner violence were not associated with average prevalence of child marriage or inequities in the levels of secondary school completion or earned income. It may be that the tradition of child marriage is restricted to specific regions or groups within a country and hence any association would be better captured at a community rather than national level. Previous research has shown an association between child marriage and IPV among individuals,[29] but to our knowledge, no other studies have examined the relationship at an ecological level. With respect to secondary school completion, it turns out that rates are largely comparable for boys and girls in many countries making it a poor indicator of gender inequality.[30] Likewise, we suspect that reported levels of earned income are less reliable than data on employment or other economic indicators that were associated with IPV. These factors could partially account for the lack of association. Alternatively, it could be that IPV is more strongly associated with women's absolute status, rather than relative status to men.

Our multi-level modeling suggests that macro level processes influence women's individual risk of violence in addition to predicting the geographic distribution of abuse. Both gender norms and gender discrimination in access to land and property remain significant at the macro level when adjusted for the age and educational level of the women living there. It is unclear how to interpret that macro level norms become non-significant when attitudes accepting violence and partner's controlling behavior are added to the model. It could be argued that norms are likely to work precisely by affecting attitudes and behavior, suggesting that these measures should not be in the regression because they are on the causal pathway. As observed by Boyle and colleagues,[31] "Indiscriminately 'controlling' for individual variables could attribute valid area-level influences to confounding when, in fact, they have set in motion person-level processes that increase risk for IPV". Additional research, including exploring norms at both the survey and cluster level, could help clarify the situation.

Finally, our stratified analysis demonstrates the importance of considering cross level effects. Girl's education is more strongly associated with reduced risk of partner violence in countries where wife abuse is normative than where it is less so (as evidenced by the larger coefficient in the split samples with high acceptance). There is a similar statistical interaction between education and working for cash (at the individual level), and the overall proportion of women who work. Should the association prove causal, educating a girl would yield a bigger dividend in terms of reducing her risk of violence in countries where wife abuse is highly normative. At a bivariate level, having many women in the formal work force is negatively associated with a country's level of partner violence, but at an individual level, where few women work, working for cash increases a woman's risk of partner violence. This helps explain past conflicting findings on the impact of employment on women's risk of violence.[32]

These findings hold insights for future programming to prevent partner violence. First, greater emphasis must be placed on shifting normative expectations around the acceptability of wife beating and the perceived right of men to control female behavior. Likewise, practitioners and researchers should explore removing barriers to women's access to land and property as a potential strategy for reducing IPV levels. A study of women in Kerala India found that women who own immovable property—especially a home—are at substantially lower risk of both current and lifetime partner violence.[33]

More generally, prevention planning must acknowledge that factors have differential impact at the macro, community and individual level and that strong cross-level effects exist. Thus a microfinance or job creation programme could increase women's risk of IPV in the short term, even though having many women in the workforce reduces a country's overall level of IPV. Likewise, some factors hold differential potential to reduce risk in high versus low violence settings, as indicated by the larger coefficients in the quantile regressions run among countries with the highest levels of current partner violence compared to the lowest (top 20% of IPV distribution versus the bottom 20%). Greater understanding of these differentials could help better target prevention interventions.

Finally, given economic empowerments potential to increase violence in the short term, programmes must anticipate these risks and incorporate training for staff and safety planning with women to minimize any negative consequences of shifts in household gender dynamics.

Limitations.

Our findings are only as sound as the reliability of the original data sources, some of which rely on government reporting. Since data for many of the World Bank and OECD exposure variables are available only for certain years, covariate and outcome data are not optimally time-matched for all countries. Because national-level indicators change slowly and covariates aggregated from the studies are not subject to this concern, we do not consider this a major threat to validity.

An inherent problem in all macro level analyses is to separate correlation from causality. We do not claim causality for any of the correlations presented here. There are many potential variables that may affect both abuse as well as our exposures of interest. We do find, however, that GDP is unlikely to be causally related to IPV whereas norms and ownership rights are more likely to be so. We urge future studies to use case studies and exploit natural experiments to disentangle the causal relationship between variables where possible.

Finally we have used country/survey as our level of interest. While this makes sense for factors such as laws and GDP, it may be too high a level for analyzing acceptance and employment. Multi-level studies that have used cluster or village level data have found different cross-level effects than we do here. For example, Boyle and colleagues[31] find in India that acceptance of violence at the neighborhood/cluster level dampens the protective effect of education on violence, whereas we find that education is more protective in countries with high acceptance of violence. Likewise Cools and Kotsadam[34] find that in Africa, there is more risk of abuse for women working in clusters where there is higher acceptance of violence; but we find no such interaction at the macro level across our more geographically varied data set. These differences highlight that reducing IPV requires attention to the variable impacts the same factor may have at different levels of the social ecology and a strategic matching of interventions to targeted level. We plan to explore community-level impacts on IPV and cross level effects of macro versus cluster level factors in future analysis.

Declaration of Interests: The authors have no conflicts of interest to disclose

Contributors: Heise designed the study and developed the first draft of the manuscript. Kotsadam conducted the analysis and contributed to the manuscript. Both authors coded the data and interpreted the results.

Research in Context:

Prior to initiating the study the authors conducted a comprehensive, but non-systematic, review of the literature on macro and community factors associated with levels of partner violence. The authors searched the economics, medical, and social science literature as well as relevant websites for both peer reviewed and grey literature. Only 12 relevant studies were identified, all with substantial methodological flaws.

The current study is the first to analyse macro-level predictors of partner violence using a well-defined and highly comparable measure of partner violence, based on self-reported victimization in population-based surveys, all using the same questions, survey methods, and ethical controls.

The study demonstrates that gender-related factors at the country and regional level—especially norms and property rights--predict the population prevalence of current partner violence (physical or sexual violence in the last 12 months). This suggests that policy makers could reduce violence by eliminating gender bias in ownership rights and addressing norms that justify wife beating and male control of female behavior.

The study also demonstrates that the macro-environment can potentiate or dampen the impact that individual-level factors have on the risk of partner violence. Prevention planners should place greater emphasis on policy reforms at the macro level and take cross-level effects into consideration when designing interventions.

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Web-Appendix 1

Table A1. Total sample in the macro analysis.

Country	Number of surveys
Azerbaijan	1
Bangladesh	2
Brazil	2
Burkina Faso	1
Cambodia	3
Cameroon	2
Colombia	5
Congo DR	1
Cote d'Ivoire	2
Dominican Republic	2
Gabon	1
Germany	1
Ghana	1
Haiti	4
India	2
Japan	1
Jordan	2
Kenya	3
Kyrgyz Republic	1
Liberia	2
Malawi	3
Mali	1
Moldova	1
Mozambique	1
Namibia	1
Nepal	1
New Zealand	1
Nigeria	1
Pakistan	2
Peru	12
Philippines	1
Rwanda	3
Samoa	1
Sao Tome and Principe	2
Serbia	1
Tajikistan	1
Tanzania	4
Thailand	1
Timor-Leste	2
Turkey	1
Uganda	2
Ukraine	1
Zambia	1
Zimbabwe	4
Total	88

Web Appendix 2

Robustness tests

In Table A2 we use a restricted sample—only those surveys that have all variables--to show that the result in Table 2 are not a function of sample size. Likewise, Table A3 shows that the results are similar if we use median values (qreg), and the results are also similar with 20 and 80 percentiles in the quintile regressions (Tables A4 and A5).

Table A2. Ecological analysis of select covariates and population levels of current partner violence in restricted sample

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acceptance of violence		0.116	0.128**	0.146**	0.135*	0.129*	0.079	0.087
		(0.127)	(0.044)	(0.026)	(0.069)	(0.091)	(0.219)	(0.151)
Partner control			0.090***	0.084***	0.085***	0.091***	0.094***	0.095***
			(0.003)	(0.009)	(0.007)	(0.003)	(0.001)	(0.001)
GDP per capita	-0.052**	-0.032	-0.020	-0.015	-0.017	-0.012	0.011	0.010
	(0.013)	(0.137)	(0.343)	(0.509)	(0.496)	(0.641)	(0.641)	(0.670)
Age 15 to 24				-0.082	0.111	-0.002	-1.056	-0.826
				(0.838)	(0.852)	(0.997)	(0.132)	(0.245)
Age 25_34				0.499	0.539	0.612	-0.556	-0.285
				(0.370)	(0.333)	(0.258)	(0.477)	(0.697)
School less than 8 years					-0.098	-0.101	0.041	-0.009
					(0.515)	(0.499)	(0.791)	(0.948)
School 8-11 years					-0.109	-0.113	-0.027	-0.133
					(0.539)	(0.538)	(0.873)	(0.420)
Women work for cash						-0.098	-0.007	-0.029
						(0.529)	(0.966)	(0.841)
Land Discrimination								0.134*
								(0.055)
Credit/Banking Discrimination								-0.011
								(0.867)
Property Discrimination								0.128*
								(0.066)
Ownership discrimination							0.313***	
							(0.006)	
Constant	0.726***	0.530***	0.252	0.106	0.121	0.123	0.471	0.380
	(<0.0001)	(0.007)	(0.225)	(0.740)	(0.730)	(0.704)	(0.139)	(0.264)
Observations	56	56	56	56	56	56	56	56
R-squared	0.356	0.395	0.560	0.568	0.573	0.581	0.692	0.717

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level.
*** p<0.01, ** p<0.05, * p<0.1

Table A3. Median regression: quintile

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acceptance of violence		0.252***	0.183***	0.206***	0.216***	0.146**	0.107	0.071
		(<0.0001)	(0.003)	(0.001)	(0.002)	(0.030)	(0.104)	(0.308)
Partner control			0.074***	0.079***	0.085***	0.102***	0.108***	0.098***
			(0.001)	(0.001)	(0.002)	(<0.0001)	(<0.0001)	(<0.0001)
GDP per capita	-0.063***	-0.027*	-0.020	-0.012	-0.012	-0.024	-0.010	-0.000
	(<0.0001)	(0.064)	(0.228)	(0.520)	(0.581)	(0.276)	(0.638)	(0.987)
Age 15 to 24				-0.108	-0.198	0.332	-0.531	-0.162
				(0.755)	(0.623)	(0.451)	(0.341)	(0.788)
Age 25_34				0.229	0.014	0.139	-0.601	-0.787
				(0.662)	(0.981)	(0.790)	(0.320)	(0.231)
School less than 8 years					-0.004	-0.157	-0.061	-0.038
					(0.964)	(0.156)	(0.647)	(0.793)
School 8-11 years					0.028	-0.118	-0.067	-0.029
					(0.828)	(0.435)	(0.694)	(0.878)
Women work for cash						-0.133	-0.117	-0.089
						(0.239)	(0.286)	(0.433)
Land Discrimination								0.041
								(0.408)
Credit/Banking Discrimination								0.031
								(0.701)
Property Discrimination								0.146**
								(0.045)
Ownership discrimination							0.176**	
							(0.046)	
Constant	0.749***	0.322*	0.189	0.086	0.160	0.201	0.502	0.328
	(<0.0001)	(0.059)	(0.268)	(0.803)	(0.676)	(0.562)	(0.128)	(0.342)
Observations	88	80	64	64	64	63	56	56

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table A5. Quintile regression: q20

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acceptance of violence		0.114**	0.097**	0.097**	0.216***	0.055	0.034	0.073
		(0.048)	(0.041)	(0.046)	(0.002)	(0.285)	(0.542)	(0.119)
Partner control			0.042**	0.045**	0.085***	0.051**	0.033*	0.032*
			(0.019)	(0.014)	(0.002)	(0.012)	(0.095)	(0.054)
GDP per capita	-0.047***	-0.036**	-0.031**	-0.018	-0.012	-0.027	-0.003	0.009
	(<0.0001)	(0.014)	(0.016)	(0.231)	(0.581)	(0.117)	(0.845)	(0.503)
Age 15 to 24				0.147	-0.198	0.094	0.315	0.000
				(0.587)	(0.623)	(0.784)	(0.507)	(1.000)
Age 25_34				0.714*	0.014	0.657	-0.155	0.062
				(0.087)	(0.981)	(0.111)	(0.762)	(0.884)
School less than 8 years					-0.004	-0.017	-0.168	-0.115
					(0.964)	(0.845)	(0.146)	(0.230)
School 8-11 years					0.028	-0.002	-0.181	-0.123
					(0.828)	(0.983)	(0.218)	(0.334)
Women work for cash						-0.048	0.153	-0.022
						(0.582)	(0.106)	(0.772)
Land Discrimination								0.074**
								(0.028)
Credit/Banking Discrimination								0.015
								(0.776)
Property Discrimination								0.127***
								(0.010)
Ownership discrimination							0.215***	
							(0.006)	
Constant	0.618***	0.465***	0.351**	-0.049	0.160	0.101	0.100	0.073
	(<0.0001)	(0.007)	(0.011)	(0.854)	(0.676)	(0.708)	(0.718)	(0.749)
Observations	88	80	64	64	64	63	56	56

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table A6. Quintile regression: q 80

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acceptance of violence		0.315***	0.205**	0.271***	0.232***	0.201**	0.111	0.165***
		(0.001)	(0.014)	(0.001)	(0.001)	(0.021)	(0.101)	(0.009)
Partner control			0.095***	0.088***	0.089***	0.113***	0.128***	0.078***
			(0.003)	(0.004)	(0.002)	(0.001)	(<0.0001)	(0.001)
GDP per capita	-0.076***	-0.035	-0.017	-0.025	-0.025	0.016	0.001	0.018
	(0.002)	(0.113)	(0.437)	(0.327)	(0.283)	(0.571)	(0.972)	(0.326)
Age 15 to 24				-0.577	-0.514	-1.004*	-0.452	-1.716***
				(0.201)	(0.217)	(0.081)	(0.432)	(0.002)
Age 25_34				0.659	0.399	0.081	-1.367**	0.327
				(0.335)	(0.499)	(0.904)	(0.033)	(0.564)
School less than 8 years					0.026	0.212	0.087	-0.121
					(0.797)	(0.138)	(0.530)	(0.335)
School 8-11 years					-0.019	0.195	0.243	-0.274
					(0.885)	(0.317)	(0.171)	(0.106)
Women work for cash						-0.214	-0.013	-0.009
						(0.144)	(0.909)	(0.930)
Land Discrimination								0.218***
								(<0.0001)
Credit/Banking Discrimination								0.050
								(0.477)
Property Discrimination								-0.002
								(0.978)
Ownership discrimination							0.325***	
							(0.001)	
Constant	0.861***	0.356	0.134	0.216	0.273	0.072	0.347	0.523*
	(0.005)	(0.165)	(0.565)	(0.627)	(0.488)	(0.872)	(0.305)	(0.086)
Observations	88	80	64	64	64	63	56	56

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Tables A6 and A7 show the results separately for urban and rural areas. Interestingly we note that acceptance is more important in urban areas and that ownership rights are more important in rural areas.

Table A6: Urban areas.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acceptance of violence		0.179***	0.146***	0.176***	0.180***	0.142**	0.105	0.110*
		(0.006)	(0.007)	(0.006)	(0.009)	(0.035)	(0.113)	(0.076)
Partner control			0.075***	0.075***	0.074***	0.080***	0.082***	0.084***
			(0.008)	(0.007)	(0.007)	(0.002)	(0.003)	(0.003)
GDP per capita	-0.051**	-0.033**	-0.012	-0.002	-0.001	0.007	0.006	0.010
	(0.015)	(0.034)	(0.522)	(0.956)	(0.963)	(0.807)	(0.827)	(0.696)
Age 15 to 24				-0.039	-0.052	-0.056	-0.616	-0.457
				(0.923)	(0.903)	(0.896)	(0.273)	(0.416)
Age 25_34				0.706	0.705	0.699	0.122	0.333
				(0.132)	(0.145)	(0.135)	(0.870)	(0.636)
School less than 8 years					0.010	0.026	0.032	0.044
					(0.886)	(0.733)	(0.762)	(0.668)
School 8-11 years					0.018	0.029	-0.017	-0.073
					(0.787)	(0.748)	(0.868)	(0.490)
Women work for cash						-0.155	-0.087	-0.136
						(0.159)	(0.545)	(0.331)
Land Discrimination								0.111
								(0.138)
Credit/Banking Discrimination								-0.062
								(0.337)
Property Discrimination								0.062
								(0.379)
Ownership discrimination							0.183	
							(0.101)	
Constant	0.585***	0.539***	0.254	-0.017	-0.021	-0.044	0.169	0.008
	(0.001)	(<0.0001)	(0.145)	(0.967)	(0.962)	(0.916)	(0.718)	(0.986)
Observations	86	78	62	62	62	61	55	55
R-squared	0.293	0.491	0.586	0.605	0.605	0.603	0.654	0.686

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level.
*** p<0.01, ** p<0.05, * p<0.1

Table A7: Rural areas

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acceptance of violence		0.168**	0.110	0.114*	0.112	0.107	0.010	0.019
		(0.019)	(0.126)	(0.075)	(0.129)	(0.140)	(0.892)	(0.751)
Partner control			0.083***	0.103***	0.105***	0.106***	0.106***	0.088***
			(0.007)	(0.002)	(0.003)	(0.002)	(<0.0001)	(0.001)
GDP per capita	-0.056**	-0.038**	-0.030	-0.021	-0.024	-0.023	-0.001	-0.007
	(0.010)	(0.035)	(0.200)	(0.364)	(0.285)	(0.328)	(0.967)	(0.704)
Age 15 to 24				0.446	0.506	0.415	-0.580	-0.778
				(0.220)	(0.230)	(0.355)	(0.341)	(0.174)
Age 25_34				-0.396	-0.341	-0.289	-1.319***	-0.721*
				(0.393)	(0.475)	(0.544)	(0.003)	(0.080)
School less than 8 years					-0.053	-0.069	0.088	-0.073
					(0.776)	(0.724)	(0.660)	(0.654)
School 8-11 years					-0.021	-0.041	0.048	-0.183
					(0.939)	(0.878)	(0.846)	(0.406)
Women work for cash						-0.079	0.071	0.001
						(0.605)	(0.576)	(0.991)
Land Discrimination								0.169**
								(0.027)
Credit/Banking Discrimination								-0.084
								(0.291)
Property Discrimination								0.190***
								(0.002)
Ownership discrimination							0.327***	
							(0.005)	
Constant	0.683***	0.487***	0.315	0.278	0.302	0.358	0.562*	0.667**
	(<0.0001)	(0.006)	(0.206)	(0.357)	(0.407)	(0.345)	(0.064)	(0.019)
Observations	83	75	59	59	59	59	54	54
R-squared	0.282	0.427	0.524	0.556	0.559	0.564	0.726	0.768

All variables correspond to their mean values in the survey in question. All regressions include year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level.

*** p<0.01, ** p<0.05, * p<0.1

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Table A8. Multilevel analysis in all surveys using odds ratios after logit regressions.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Survey level variables						
GDP per capita	1.019	1.071	0.993	0.964	1.161	1.041
	(0.880)	(0.606)	(0.956)	(0.797)	(0.240)	(0.714)
Acceptance of violence	2.018**	1.908**	1.602	1.670	0.656	0.836
	(0.029)	(0.043)	(0.151)	(0.147)	(0.367)	(0.616)
Partner control	1.453*	1.445*	0.862	0.839	1.058	0.896
	(0.061)	(0.066)	(0.444)	(0.381)	(0.738)	(0.436)
Women work for cash				1.460	2.473	1.825
				(0.725)	(0.286)	(0.444)
Ownership discrimination					6.804***	
					(<0.0001)	
Land Discrimination						2.424***
						(0.008)
Credit/Banking Discrimination						0.503
						(0.186)
Property Discrimination						2.936***
						(<0.0001)
Individual level variables						
Acceptance of violence			1.362***	1.363***	1.365***	1.363***
			(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Partner control			1.581***	1.580***	1.587***	1.588***
			(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Age 25 to 34	0.934	0.961	0.977	0.978	0.988	0.980
	(0.128)	(0.381)	(0.664)	(0.679)	(0.815)	(0.689)
Age > 34	0.731***	0.736***	0.725***	0.726***	0.744**	0.732***
	(0.001)	(0.001)	(0.005)	(0.005)	(0.014)	(0.008)
School 8-11 years		0.838	0.903	0.902	0.911	0.881
		(0.181)	(0.454)	(0.449)	(0.496)	(0.356)
School > 11 years		0.565***	0.667**	0.667**	0.690**	0.678**
		(0.001)	(0.027)	(0.028)	(0.037)	(0.030)
Observations	366,771	366,670	351,071	349,914	341,381	341,381

The survey level variables are means at the survey level and the individual level variables are at the individual level. All regressions include year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level.

*** p<0.01, ** p<0.05, * p<0.1

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Table A9: Tests for interactions (yields p values for split regressions presented in Table 5

VARIABLES	(1)	(2)	(3)	(4)
Acceptance of violence	0.047***	0.050***	0.029***	0.045***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Partner control	0.083***	0.073***	0.090***	0.074***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Woman work for cash	0.015*	0.015	0.012	0.028***
	(0.069)	(0.126)	(0.126)	(<0.0001)
Age 25 to 34	-0.019*	0.004	-0.013	-0.006
	(0.073)	(0.610)	(0.396)	(0.329)
Age > 34	-0.053**	-0.046***	-0.047	-0.067***
	(0.030)	(0.008)	(0.147)	(<0.0001)
School 8-11 years	-0.002	-0.054**	-0.012	-0.093***
	(0.868)	(0.019)	(0.493)	(<0.0001)
School > 11 years	-0.029**	-0.102***	-0.034	-0.130***
	(0.030)	(<0.0001)	(0.193)	(<0.0001)
Survey with high acceptance of violence	0.069**			
	(0.027)			
Survey with high share of women working		-0.068**		
		(0.021)		
Survey with very high acceptance of violence			0.085*	
			(0.055)	
Survey with very high share of women working				-0.087**
				(0.044)
Interaction with Age 25 to 34	0.027*	-0.019	0.008	0.002
	(0.064)	(0.266)	(0.619)	(0.920)
Interaction with Age > 34	0.012	-0.002	-0.012	0.046
	(0.691)	(0.960)	(0.734)	(0.151)
Interaction with School 8-11 years	-0.056**	0.059**	-0.040	0.074***
	(0.024)	(0.022)	(0.129)	(0.002)
Interaction with School > 11 years	-0.057*	0.077***	-0.051*	0.089***
	(0.072)	(0.002)	(0.097)	(0.001)
Interaction with Acceptance of violence	-0.004	-0.010	0.031***	0.004
	(0.753)	(0.424)	(0.004)	(0.768)
Interaction with Partner control	-0.012	0.009	-0.020	0.026
	(0.304)	(0.452)	(0.264)	(0.110)
Interaction with Woman work for cash	-0.007	-0.001	-0.007	-0.012
	(0.626)	(0.964)	(0.528)	(0.184)
Constant	0.032	0.095***	0.021	0.078***
	(0.265)	(<0.0001)	(0.595)	(<0.0001)
Observations	348,922	348,922	141,937	157,334
R-squared	0.130	0.130	0.169	0.151

All variables are at the individual level except for the variable used to interact with all variables. All regressions include year fixed effects as well as interactions with year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level.

*** p<0.01, ** p<0.05, * p<0.1

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Table A10. Strategic sample splits (same as cross level interactions)

VARIABLES	(1) High share (above median) of women working	(2) Low share (below median) of women working	(3) Very high share (80p) of women working	(4) Very low share (20p) of women working
Acceptance of violence	0.040***	0.050***	0.049***	0.045***
	(<0.0001)	(<0.0001)	(0.005)	(<0.0001)
Partner control	0.082***	0.073***	0.100***	0.074***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Woman work for cash	0.014**	0.015	0.016*	0.028***
	(0.050)	(0.138)	(0.076)	(<0.0001)
Age 25 to 34	-0.014	0.004	-0.004	-0.006
	(0.328)	(0.617)	(0.761)	(0.351)
Age > 34	-0.047*	-0.046**	-0.021	-0.067***
	(0.088)	(0.012)	(0.502)	(<0.0001)
School 8-11 years	0.005	-0.054**	-0.020*	-0.093***
	(0.666)	(0.025)	(0.095)	(0.001)
School > 11 years	-0.025*	-0.102***	-0.042*	-0.130***
	(0.080)	(<0.0001)	(0.073)	(<0.0001)
Constant	0.026	0.095***	-0.009	0.154***
	(0.332)	(<0.0001)	(0.831)	(<0.0001)
Observations	187,629	161,293	53,850	103,484
R-squared	0.149	0.105	0.231	0.107

All variables are at the individual level and the different columns correspond to different sample splits. All regressions include year fixed effects. Robust p-values in are in parentheses. All standard errors are clustered at the country level.
*** p<0.01, ** p<0.05, * p<0.1