UNDERSTANDING THE RELATIONSHIP BETWEEN INTIMATE PARTNER VIOLENCE AND GOING AGAINST THE NORM IN LOW- AND MIDDLE-INCOME COUNTRIES: WHAT ARE THE IMPLICATIONS OF BEING ON THE VANGUARD OF WOMEN'S ECONOMIC PARTICIPATION?

by
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Abstract

Background: Women's economic empowerment (WEE) is postulated to reduce intimate partner violence (IPV), yet the results are mixed across low- and middle- income countries (LMICs). Few studies have explored how broader layers of the social ecology inform WEE-IPV relationships at the individual-level. This dissertation 1) constructs an index capturing the extent to which a woman is going against the community norm on women's economic participation, the "vanguard WEE" index, 2) examines associations of the vanguard WEE index with IPV, and 3) tests moderation of the vanguard WEE and IPV relationship by the Women, Business and Law Index (WBL), a validated national-level index capturing WEE-promoting legislation.

Methods: Dissertation analyses were secondary analyses of cross-sectional data from the Demographic and Health Surveys (DHS). The analytic sample for constructing the vanguard WEE index was 440,836 women across 49 LMICs. The analytic sample for IPV analysis was a sub-sample of 189,414 partnered women across 44 LMICs. Multilevel mixed effects models with both random intercepts and random slopes were used to achieve study aims.

Results: The vanguard WEE index (mean: 1.1, SD: 1.2) was a count of women's individual WEE items, while living in a community with item prevalence <35% or =>35% and <=65% and in the bottom two-thirds of the community-level distribution within the region. The index was validated through association with increased gender financial discrimination (p<0.001). As compared to women with no vanguard WEE items, women with at least one vanguard WEE item had increased probability of past-year physical IPV (marginal effect 0.01; 95% CI: 0.01, 0.02), past-year sexual IPV (marginal effect 0.01; 95% CI: 0.01, 0.01), and current partner control (marginal effect 0.02; 95% CI: 0.01, 0.03). The WBL index

interacted significantly with vanguard WEE on past-year physical IPV (B 0.05, 95% CI 0.02, 0.08), but not on past-year sexual IPV or current partner control.

<u>Conclusions:</u> Dissertation results provide evidence of increased IPV among women going against the economic norm. Given the risk of potential backlash against economic gain, especially where WEE is not normative, WEE operations should incorporate rigorous and locally informed safeguarding systems to monitor and mitigate harmful spousal backlash.

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1. Chapter One: Introduction

a. Introduction

Intimate partner violence (IPV) is a persistent global health challenge.[1,2] An estimated 27%

and 13% of ever-partnered women worldwide have experienced physical or sexual IPV in

their lifetime and in the past year, respectively.[3] A feminist perspective views violence

against women as a form of patriarchal dominance resulting from widespread gender

inequality.[4] Women's economic empowerment (WEE) is a key component of the

Sustainable Development Goals to combat gender inequality.[5] WEE is postulated to reduce

intimate partner violence (IPV). However, the relationship between WEE and IPV has

proven highly variable across low- and middle-income countries (LMICs).[6,7] A central

knowledge gap around why the WEE-IPV relationship is protective in some cases and risky

in others is due to a focus on WEE at the individual level only, without consideration of the

level at with women's economic participation is *normative* within the local context. To our

knowledge, no study has examined how the individual-level WEE-IPV relationship differs

by whether women's economic participation is locally normative across diverse settings.

Further still, few studies have worked to understand how broader national legal contexts

affect these relationships.

Against this backdrop, this dissertation sought to test the hypothesis that IPV is higher

among women whose economic participation goes against the community norm, termed

"vanguard WEE." This dissertation defines vanguard WEE as economic behavior or asset

acquisition by a woman in places where most women *do not* engage in that economic

behavior or asset acquisition. We constructed an individual-level vanguard WEE index that

compares individual-level economic participation to the community descriptive norm across 49 LMICs. Using DHS data across 44 LMICs, the relationship between vanguard WEE and IPV was assessed. Using a publicly available and validated national-level index capturing laws that promote women's economic participation, this dissertation tested whether national-level legislation informs the vanguard WEE-IPV relationship.

b. Specific aims

The aims of this dissertation are as follows:

Aim 1: Compare strategies for generating a vanguard WEE index that captures the extent to which a woman's economic participation goes against the community norm across 49 LMICs. Explore validation of the proposed vanguard WEE index. Explore characteristics of women going against the economic norm.

Aim 2: Assess the association between vanguard WEE and IPV cross-sectionally across 44 LMICs. Test the moderating effects of household wealth on the vanguard WEE-IPV relationship.

Aim 3: Assess whether national laws promoting economic gender equality, measured by the World Bank's Women, Business and Law Index (WBL), moderate the vanguard WEE-IPV relationship across 44 LMICs. Test the moderating effects of each of the eight sub-indices of the WBL on the vanguard WEE-IPV relationship.

The foundational framing of this dissertation is Bronfenbrenner's 1992 socioecological systems model.[8] Socioecological theory states that human experience is shaped by exchanges between individuals, their microsystem (family, peers, community, etc.), and their macrosystem (laws, institutions, etc.).[8,9] The model was adopted by Heise (1998) for practitioners working in LMICs to understand how factors across the layers of the social ecology influence violence against women.[9,10] As Heise (1998) described, an ecological approach "*conceptualizes violence as a multifaceted phenomenon grounded in an interplay among personal, situational, and sociocultural factors.*"[9] This dissertation explores the interaction of individual-level IPV risk with the microsystem through the construction and application of the vanguard WEE measure using community norms (Aims 1 and 2) and the macrosystem through the exploration of national laws and policies (Aim 3).

c. <u>Background</u>

Determinants and prevalence of IPV

Gender-based violence (GBV) remains a global pandemic crossing class, racial, and cultural borders. GBV is characterized by harmful behaviors aimed at someone because of their gender, manifesting gendered power dynamics in public and private spaces.[11] Violence against women (VAW) includes intimate partner violence (IPV), domestic abuse and control, honor killings, female genital mutilation, sex trafficking, early marriage, and non-partner sexual assault.[12] IPV is the most common form of VAW. Almost a third of women globally (27%) experience physical or sexual violence by a partner in their lifetime; consequences include injury, mental health conditions, and death.[1,13] While IPV remains a challenge in all countries, violence-related death and injury are more prevalent in LMICs.

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Past-year IPV estimates by super region are shown in Figure 1.1.[13] All genders experience IPV and IPV exists in same-sex relationships. Given this data source, this dissertation focuses on opposite-sex couples in which the male partner is the perpetrator, and the female partner is the survivor.

Figure 1.1 IPV past 12 months
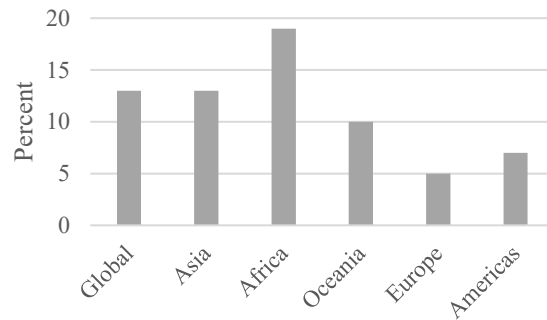
The enablers of IPV perpetration are complex, including pathways related to personal experiences such as exposure to trauma as a child[14-16], poor mental health[17,18], access to weapons[19], societal mechanisms for victim support, poverty, and social norms.[18,20-22] This dissertation's primary focus is on a structural cause of IPV against women: the gender system. The gender system provides different levels of power and status to different groups and, thus, is a significant social determinant of health.[23] In Gender Systems Theory, the gender system is explained as "*the structures, social relations, and processes that define males and females as different in socially significant ways and justify inequality on the basis of that difference.*" [24] Thus, systems of patriarchy that enforce gender inequality lead to increased IPV rates.[25]

Gender equality is the concept that everyone, regardless of sex or gender, can live free from limitations created by gender roles, discrimination, or stereotypes. As described by the Lancet Series on Gender Equity, Norms, and Health, gender equality does not mean that genders become the same but that different behaviors by genders are equally valued; gender equality implies that sex at birth does not influence opportunity across the

lifecourse.[24] Gender inequality persists worldwide: women earn less, are less educated, and experience less political, economic, and social authority than men.[26] While significant gender equity gains have been made in educational attainment and health, gender disparity in economic participation remains stark.[27]

WEE theories and measurement

It is widely recognized that economic gender equality is critical for successful international development and improved global health. Mitra et al. (2015) find that a standard deviation increase in gender equality is associated with a 1.2 percentage point increase in economic growth on average across developing countries.[28] When we invest in women, households are more likely to put their money into child health and education.[3,4] As such, many governments and organizations have invested in women's empowerment agendas, and efforts to economically empower women in LMICs have boomed in the past two decades. Concepts of women's economic empowerment (WEE) emerge in the Sustainable Development Goals on gender equality, where economically empowering women is a key component of Goal 5 on Gender Equality.[29]

This dissertation follows the definition of empowerment presented by Kabeer (2016): "*the expansion in the capacity to make strategic and meaningful choices by those who have previously been denied this capacity but in ways that do not reproduce, and may actively challenge, the structures of inequality in their society…it extends, in other words, from changes in women's sense of their own self-worth to their ability to think and act like citizens.*" [30] Empowerment is a process of change that positions women as free to exercise

agency on various life choices in a way previously limited by gendered social expectations. Economic empowerment is a specific form of empowerment relating to acquiring access to and agency over economic productivity. For instance, common conceptualizations of broader empowerment that are *not* part of economic empowerment include public engagement, social networks, reproductive health access, and attitudes to women's rights.[31] Laszlo et al. (2020) define WEE as "*the process by which women acquire access to and control over economic resources, opportunities, and markets enabling them to exercise agency and decision-making power to benefit their lives*."[32] WEE is typically measured at the individual level.

Scholars theorize economic empowerment as a process in which resources and agency work to achieve well-being.[33] *Resources* regarding the economic sphere of empowerment include work[1] and access to cash, ownership of a bank account, and mobile phone ownership, among other sources that provide people with economic stability and the ability to act on choice. *Agency* is defined as the ability to set and achieve goals; Sen (1985) defines it as "*the freedom to achieve whatever the person, as a responsible agent, decides he or she should achieve.*"[34] Typical measures of agency in LMICs are women's participation in household decisions, but other measures include the locus of control, self-efficacy to set goals, and the relative autonomy index.[35]

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[1]Work as a component of WEE is complicated, as work can be disempowering. While paid work may be an indicator of empowerment for some women, other groups such as ultra-poor women may be forced as a group to engage in disempowering or even harmful paid work that take from their ability to juggle family responsibilities and contribute to financial decisions, investments, and social and psychological self-development. However, work is often still included as a WEE proxy.

A lack of consensus on defining, operationalizing, measuring, and promoting WEE remains a critical issue across public health, economics, international development, social work, and anthropology.[35-39] In

Figure 1.2 WEE indicators, weighted percentage across 49 countries

Economic Resources
- Worked in past year; 57%
- Earns the same or more than husband; 11%
- Above primary education; 53%
- Professional occupation; 6%

Economic Agency
- Participates – decision on husband's earnings; 60%
- Participates – household purchase decision; 67%
- Main decision-maker – access own healthcare; 32%
- Main decision-maker – own earnings; 20%

practice, measures are proxies of a complicated latent construct of economic empowerment. Many WEE studies focus on women's labor participation and household decision-making participation.[40] The goal of this dissertation is not to propose a valid measure of WEE but rather to contribute to the ongoing conversation on how to apply commonly used WEE indicators to expand its conceptualization and consider the individual in relation to the prevailing economic participation context. The WEE measures used in this dissertation are presented in Figure 1.2.

Theory on the WEE-IPV relationship

WEE is often postulated to protect against IPV, supported by four theories (Table 1.1). *Social Exchange Theory* asserts that human relationships are guided by pursuing awards and avoiding penalties or costs. Therefore, if a woman stays in a harmful relationship, she is either getting something out of the relationship that is greater than the cost of being hurt or is avoiding the cost of not being in the relationship. If a woman is economically

empowered, the cost of leaving the relationship is less; therefore, experiencing violence is less tolerated.[41] This theory relates to *Marital Dependency Theory*, which suggests that women who are more economically independent are more able to leave an abusive relationship.[42] *Capability Theory* attests that economically empowered women are less dependent on a relationship not only due to increased cash, but also improved social networks and self-efficacy that support them in navigating resources inside and outside the home.[43] Lastly, the *Stress and Absolute Resource Theory* outlines that IPV is often mediated by stress, and improved household finances due to WEE may decrease stress and therefore IPV.[44,45]

Table 1.1 WEE - IPV theories

Theory	WEE relationship with IPV	Description
WEE reducing IPV through household- and individual-level change		
Social Exchange Theory[41]		Relationships are a balance of cost and reward, and it is less costly to leave a relationship for economically empowered women
Marital Dependency Theory[42]		Economically empowered women are less financially dependent on a partner and therefore do not have strong incentive to stay
Capability Impact Theory[43]		Economically empowered women are more likely to have strong social networks and improved self-efficacy, helping them navigate help-seeking systems and exit strategies
Stress and Absolute Resource Theory[45]		IPV is mediated by stress, and increased income in the household decreases stress
WEE increasing IPV through male backlash		
Relative Resource Theory[46,47]		WEE can threaten the husband's status and the existing power dynamic. This theory argues that relative spousal resources, rather than men's lack of resources, predicts wife abuse

Gender Role Strain Theory / Masculine Discrepancy Stress Theory[48]		Discrepancy stress is caused by a man believing he is or is perceived to be insufficiently masculine. Having a female partner earning money or more money than he may lead to masculine discrepancy stress and such stress can lead to men seeking out gender performance to confirm their manhood to themselves and others- in some communities such performance includes violence

The reigning explanation for why WEE can be "risky" is the phenomenon of male backlash in the form of IPV (Table 1.1). To understand backlash, we draw on Gender Theory, which asserts that achieving manhood or womanhood is socially evaluated through shared social norms and expectations. Masculinity and femininity are not fixed characteristics or personality traits. Gender performance is done with and for social actors to construct a sense of belonging and identity.[49] Young men and women are taught an ideal version of masculinity and femininity that many aspire to. In many communities, being the household financial provider is a crucial component of masculinity. Such views position men who are not the primary financial provider as failures in achieving manhood.[50]

Two theories help explain male backlash against WEE: Relative Resource Theory and Gender Role Strain Theory/ Masculine Discrepancy Stress Theory. While similar, these theories differ slightly in the reason for violence perpetration. *Relative Resource Theory* asserts that men exert violence to establish dominance when they feel threatened by having fewer resources than their partners.[46,47] *Gender Role Strain Theory* asserts that a man whose partner takes on traditionally male roles may feel stressed about not coming off as masculine enough and may use violence to "perform" masculinity, to assure himself or others of his manhood. This theory assumes that the man views violence perpetration as a

display of manhood. Reidy et al. (2014) have described stress arising from a perceived failure to live a life in concordance with "ideal manhood" as masculine discrepancy stress.[2,48]

Empirical evidence of male backlash

A growing body of evidence highlights that the likelihood of individual WEE leading to male backlash is context-specific.[51-53] For example, Koenig (2003) found that savings and credit groups for women increased intimate partner violence in culturally conservative areas of Bangladesh but did not do so in less conservative areas.[54] Similarly, Aisa (2014) found that conditional cash transfers are more likely to be a risk factor for rural women but a protective factor for urban women.[55] Hidrobo (2013) found that individual-level WEE may increase IPV in places where women have much less decision-making power than men.[56] Using Demographic and Health Surveys (DHS) across 28 countries, Peterman (2017) found that women's asset ownership is associated with IPV negatively in three countries, positively in five countries, and not significantly in 20 countries.[57] A study using DHS data found that male backlash against WEE is more probable in communities with stronger wife-beating norms.[58] Other work demonstrates that women in microfinance programs, particularly those without gender norms training, have increased IPV in specific contexts;

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[2]It is important to emphasize that not all masculinities are sexist or violent – some are intolerant of violence and position men as feminist advocates of gender equality. The social context determines whether men who identify with such versions of masculinity experience threats of emasculation.

for example, a 1990s study on credit programs for women in Bangladesh found increased partner economic control and anecdotal partner violence due to participation.[6,59]

Qualitative work with women who recently began participating in microfinance programming in Bangladesh highlighted some backlash mechanisms: "*With microfinance, I bring in additional income, and he likes that. But now he also hates me. I feel he thinks I think too much of myself now that I'm a businesswoman. And he hits me because of it*"; "*He gets more upset these days because I am away a lot, he accuses me of neglecting the children, not making him his favorite meals and all that. I don't have the time, what can I do*"; "*I think the violence increased in my case because I was more independent. He liked the additional income but accused me of going out to have fun when I was going to work and that often would result in physical violence.*" [60] In-depth interviews with men in Bangladesh show that WEE destabilizes men's understanding of masculinity and gendered dynamics more broadly, with some men referencing "gender equality" as a threat to the communal backbone.[61] James-Hawkins et al. (2019) qualitatively explored how IPV use in Vietnam has become part of the cultural definition of masculinity, with suggestions that changes in women's labor participation increased violence as a tool for male dominance.[62]

Women's work status is the WEE proxy most often explored. Across studies, a well-established pattern of women's employment being associated with increased IPV has been documented.[63] For instance, Zafar et al. (2020), using data from 19 countries, found that working for pay is associated with increased IPV experience overall.[64] Stockl et al. (2021) found increased IPV among working women, particularly if the husband did not work,

across a diverse set of 15 countries.[63] A randomized controlled trial in Vietnam providing

gender and entrepreneurship training to women found increased IPV among participants;

the authors attributed this finding to trainees having strong shifts in expressing agency in

household decision-making, and with local stigma on divorce, this put trainees at increased

risk.[65]

Gaps in understanding WEE and IPV and the role of local context

Schuler et al. (2018) suggest that the mixed findings on the relationship between women's

general empowerment and IPV may be due to women's empowerment being transgressive

versus normal, or at a different point between transgressive and normal, across settings

and groups of women.[53] In a qualitative analysis of four villages in Bangladesh with varying

IPV rates and women's empowerment, Schuler et al. (2017) found in villages where

empowerment was less normative, women who became more empowered were beaten for

challenging gender norms.[52] In another village with low empowerment and low IPV,

women rarely went against traditional norms and therefore faced little violence risk. In a

village with high empowerment, overall IPV was found to be low. This qualitative work

suggests that women's empowerment does ultimately become more protective for

women.[52] These findings were further confirmed qualitatively among six villages.[51]

Supporting this theory in a different context, a study in Uganda used vignettes to assess

justification of IPV and found that in vignettes where the hypothetical woman violated

gendered standards of behavior, male and female participants were significantly more

likely to endorse IPV as acceptable, as compared to situations where the woman did not

violate standards of behavior.[66] Overall, research suggests that the prevalence of IPV in

response to WEE is non-linear due to initial male backlash against changing norms, followed by male acceptance and eventual male economic reliance on women.[61] As such, mixed results of the WEE-IPV relationship may be due to a lack of consideration of the normative context.

Despite strong theory, few studies have quantitatively explored whether the likelihood of male backlash against women's economic participation correlates with the local level of normalization of women's economic participation across diverse settings. A study by Metheny et al. (2020) explored how positively transgressing the norm on the age of marriage, fertility preference, and women's education is associated with risk for sexual IPV.[67] A second study by Heise and Kotsadam (2015) also using DHS data found that IPV among working women is higher in places where fewer women work.[25] No studies to our knowledge have investigated this phenomenon with WEE more broadly. Further, wealth is linked with both WEE and IPV, and backlash in WEE non-normative contexts may function differently depending on household wealth[67], though this is largely unexplored as most studies focus on low-income groups, such as microfinance participants. This dissertation uses cross-national data of diverse countries to seek to fill these knowledge gaps (Aim 2).

Conceptualizing non-normative, "vanguard WEE"

This dissertation uses the term *vanguard WEE* to describe economic participation that is transgressing social norms. Defining vanguard WEE begs the question of what is normative, and how do we measure it? Social norms theory defines a social norm as an implicit or explicit rule of the appropriateness of a behavior.[68] Gender norms are a sub-group of social

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norms that define the acceptable actions for women and men in a given society.[69] There are

two types of norms: descriptive and injunctive.[70] Whereas injunctive norms refer to the

perceived or actual level of approval of a given behavior by broader society, descriptive

norms refer to the perceived or actual prevalence of a given behavior within the society.[71]

At the individual level, injunctive norms are often evaluated by survey questions on views

about how people in the respondent's society view a behavior (such as the level of

agreement with the statement: "most people in my community think it's ok for a woman to

start her own business"). Reports on the injunctive norm are often biased by the

respondent's personal attitude ("I think it's ok for a woman in my community to start her

own business"). Injunctive norms can also be evaluated through laws, policies, or voting in

which collective society has agreed upon, for the most part, what is and is not acceptable

behavior and for who (for example, a law explicitly allowing women to take out a loan for a

business without a male co-signer). Descriptive norms, described as how most people act

regardless of perceived appropriateness, can be measured through observation or survey

self-report of behavior. Survey reports can often be biased by the injunctive norm ("I

manage the household finances, but I do not report this because I know society does not

approve of women doing this"). Since any given individual does not know the actual

prevalence of a behavior or the actual attitude that others have to a behavior, their

perception of the prevalence and others' attitudes guides the individual's behavior.

In this dissertation, we define vanguard WEE as a woman's economic behavior or

acquisition of a financial asset in communities where most women *do not* engage in that

economic behavior or acquire that asset, compared to a regional standard. The descriptive

norm based on documentation of conduct, or prevalence, in the population is the referent

for vanguard. The concept of "vanguard WEE" is therefore a cross-level comparison of a

woman's behavior and the descriptive social norm for women in her community.

A similar concept to "vanguard" behavior used in public health is the concept of positive

deviance. Spreitzer and Sonenshein (2016) define positive social deviance as deviating

from the norm to do something beneficial for oneself.[72] Some work on family planning has

applied a measure of positive deviance; a study in Uganda, for example, explored some of

the characteristics of young women who were dual-method users, a practice that is very

uncommon in Uganda, to protect against pregnancy and HIV.[73] Metheny et al. (2020) have

studied positive deviance on various gender equality-related outcomes, such as attaining

higher education or reducing parity as compared to the local norm.[67] The authors quantify

positive deviance as being "*statistically different by a standard measure from the norm in an*

advantageous way." Given the value assignment provided by the term "positive deviance" in

this dissertation, we do not use this term but rather the term "vanguard" to capture

behavior that is different from the norm. No study to our knowledge has used a WEE

measure that is defined in terms of the individual woman's relationship to her broader

social normative context. This dissertation aims to fill this gap (Aim 1).

The role of legislation that promotes women's economic agency

Historically, research on the drivers of IPV has focused on individual level risk factors.[74] Yet

it is widely recognized that violence risk is impacted by gender inequity operating across

all layers of the socioecological model.[9] Disparities at the highest level of the social ecology

include economic, politico-legal, or physical factors and are seen as structural disparities.[75]

Such factors are the backdrop for lower-level gender disparities such as community

inequities, household dynamics, and inequalities between couples within the home.

Together, and in a reciprocal manner, these layers affect IPV risk.

Structural interventions seek to change structural factors that act at the highest level of the

social ecology to have a "trickle-down" effect on individuals' lives.[75] Examples of structural

interventions that may affect individual-level violence experience include laws on dowry,

child marriage, divorce, women's property rights, and domestic violence. Other examples

include limitations on alcohol outlet density, cash transfer programs to target poverty and

unemployment, and affirmative action policies to target systematic racism. While

recognized as an essential piece of the IPV puzzle, there is a dearth of research on the role

of structural interventions. A 2015 systematic review of structural interventions on IPV

found substantial evidence that structural factors are important for IPV prevention.

However, the review only identified 14 studies on political/ legal structural interventions,

none of which were included in the synthesis due to eligibility criteria; a central finding of

the study is that more research on politico-legal interventions is needed.[75]

Since the 2015 review, some research on legislative impacts on violence against women

has emerged. For instance, Heise and Kotsadman (2015), using multilevel analysis over 44

countries, found that asset ownership rights for women explain some of the prevalence

patterns of IPV across countries.[25] Maxwell et al. (2022) found that laws on marital rape,

child marriage, and sexual harassment associate negatively with past year IPV.[76] Kovacs (2018) found significant negative associations between domestic violence legislation and IPV across 40 countries.[77] Similarly, Sanin (2021) found evidence that domestic violence laws that allow women to divorce based on violence experience protect women from IPV over time in Rwanda, both due to divorce rates and the deterrent effect of the law.[78] There is some evidence that progressive legal changes can increase IPV risk. Important work by Garcia-Ramos (2021) found that in Mexico, in the long-term, a legal reform on divorce laws to allow easier divorce led to a 3.7% increase in IPV rates, presumably due to IPV being used as a tool to prevent women from filing divorce, given divorce has recently become more accessible.[79] Song et al. (2020) found that women's inheritance rights in China are related to higher IPV likelihood.[4] Evidence from Cameroon shows that policies that promoted women's educational and economic opportunities are associated with significant increases in domestic violence, evidencing male backlash.[80]

The effects of structural interventions in the form of policies and laws that promote WEE on IPV are understudied. Legislation is a form of an injunctive norm, which can play a role in how going against the WEE norm affects violence risk at the individual level. The Women, Business, and the Law Index (WBL) is a World Bank measure of 190 economies[81] comprising eight indicators of gender-based differences in laws associated with women's employment, entrepreneurship, and broader economic empowerment.[82] Thus, the WBL is valuable for capturing gender equity in economic opportunity laws across nations. Assessing how the injunctive norm of national WEE legislation moderates increased IPV

risk associated with transgressing local WEE norms is critical and addressed in this

dissertation (Aim 3).

d. Conceptual framework

The conceptual framework for this dissertation draws on the theories discussed in the

above sections, with Bronfenbrenner's socioecological systems model laying the main

framing for the conceptual framework as outlined in Figure 1.3.

Figure 1.3 Conceptual framework
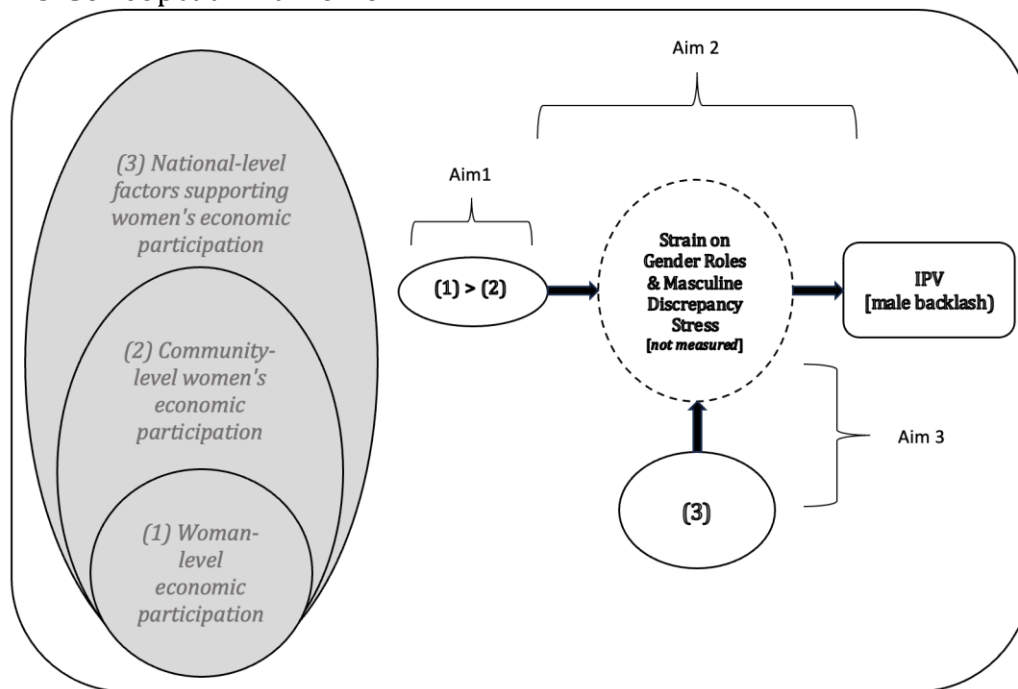
e.   References

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2. Chapter Two: Methodology

a. <u>Data source</u>

The study draws from the nationally representative Demographic and Health Surveys (DHS) with women across 49 low- and middle-income countries (LMIC).[1] This sample represents about a third of women ages 15-49 living in LMIC. The justification for using a global sample rather than a single-country focus is the dissertation's aim to conceptualize the multilevel role of women's economic participation, drawing on community WEE norms and national-level WEE laws. The DHS are household surveys in over 90 countries typically conducted every five years. The surveys provide data on IPV (referred to as domestic violence within the DHS), women's economic participation, household wealth, community factors, and individual characteristics used in this analysis.[1] We draw on the World Bank's Women, Business and Law (WBL) Index and its eight sub-indices for potential national moderators.[2]

b. <u>Study sample</u>

Sampling

The country sample used for this dissertation is all DHS country data collected since 2013 that included all eight WEE variables of interest; 49 LMICs were included (Aim 1). Of these 49, 44 conducted the domestic violence module (Aims 2 and 3). The country sample covers Asia, Africa, and South America. A list of the countries with sample sizes is provided in Table 2.1.

Table 2.1 Sample

Country	Survey Year	Number of Communities	WEE sample	IPV Sample
Afghanistan	2015	956	26,759	19,596
Albania	2018	687	6,711	--
Angola	2016	618	4,669	3,776
Armenia	2016	305	3,244	2,640
Benin	2018	555	9,533	3,630
Burundi	2017	554	4,325	2,823
Cambodia	2014	610	10,863	2,973
Cameroon	2018	428	6,691	3,372
Chad	2015	623	10,880	2,772
Colombia	2015	2,313	1,992	1,955
DR	2013	505	3,868	3,224
DRC	2014	536	10,880	4,443
Egypt	2014	815	19,535	6,012
Ethiopia	2016	638	7,047	2,930
Gambia	2020	279	6,550	1,535
Ghana	2014	424	3,696	--
Guatemala	2015	856	14,436	5,510
Guinea	2018	400	4,799	--
Haiti	2017	450	7,416	3,763
India	2016	28,425	48,755	33,785
Indonesia	2017	1,969	28,481	--
Jordan	2018	942	13,253	6,246
Kenya	2014	1,568	738	296
Liberia	2020	325	2,729	1,166
Madagascar	2021	650	8,848	3,760
Malawi	2016	850	7,900	2,236
Maldives	2017	265	5,522	3,038
Mali	2018	345	7,055	2,731
Mauritania	2021	403	9,117	2,697
Mozambique	2015	306	3,292	1,533
Myanmar	2016	440	7,126	2,853
Namibia	2013	510	1,299	484
Nepal	2016	382	5,386	2,034
Nigeria	2018	1,386	24,748	7,156
Pakistan	2018	558	14,185	3,878

Philippines	2017	1,224	11,423	9,231
PNG	2018	712	6,951	2,482
Rwanda	2015	492	4,233	991
Senegal	2019	214	4,869	1,151
Sierra Leone	2019	569	5,376	1,632
South Africa	2016	491	378	266
Tanzania	2016	605	4,243	3,345
Tajikistan	2017	366	7,194	4,674
Timor-Leste	2016	454	5,717	2,637
Togo	2014	329	4,986	3,861
Uganda	2016	696	8,415	4,703
Yemen	2013	776	14,017	--
Zambia	2014	544	6,249	5,013
Zimbabwe	2015	399	5,613	4,581
Total		59,747	440,836	189,414

The DHS survey target population is all women ages 15-49 (in a select few country cases, Albania, Cameroon, Haiti, Mozambique, and Namibia, up to age 64).[3] The DHS sample is representative at the national, urban/rural residence, and regional levels.[4] First, DHS stratification divides the sampling frame into strata homogonous on geographic region and urban/ rural. DHS stratification aims to reduce sampling errors. The household survey employs a two-stage cluster sampling procedure. First, a stratified sample of primary-sampling units (PSU) is selected based on probability proportional to size based on the country's census. Second, a complete household listing is acquired for each cluster, and a set number of households is selected by equal probability systematic sampling within each cluster. Whereas the individual women survey covers all women in selected households, the domestic violence module is conducted with only one woman per household. In households with more than one woman eligible for the DHS, a woman was randomly selected via a country-specific designed simple selection procedure for the module.[5] Among

the women randomly selected for the domestic violence module, only those who are ever-married completed the section of the domestic violence module on partner violence.

Weighting

The DHS provides an individual-woman weight (v005) which was applied to all descriptive and inferential analyses. The DHS-provided domestic violence weight was employed for analysis that uses only the domestic violence sample (d005). The DHS individual-level weights require re-normalizing when pooling countries into one dataset due to the different survey sizes of different countries. Country surveys vary considerably by size; for instance, the India survey sample is over 40,000, whereas the South Africa survey sample is 378. Without weight normalizing, one country could drive effects within pooled analysis. The weights were normalized so that each country survey is given equal weight by multiplying each original domestic violence weight by ((the total pooled sample/ number of surveys) / the sample size in the country survey).

Analytic sample

As shown in Figure 2.1, the sample for constructing country and regional averages for each WEE variable was individual women with at least one WEE item that did not have a missing value (n=1,506,068). The sample for constructing community averages for each WEE variable was restricted to communities with at least nine women surveyed for that WEE item (sample varies by item). The analytic sample for the vanguard WEE measures in Aim 1

was restricted to the sample of women for which no WEE items or covariates[3] were

missing and living in communities with at least nine women surveyed for each WEE item

(n=440,836). A subsample completed the domestic violence module; this was the analytic

sample for Aims 2 and 3 (n=189,414).

Figure 2.1 Analytic sample flow chart

1,506,068 women with at least 1 WEE variable non-missing (49 countries)	Country and regional averages
440,836 partnered women with WEE variables and covariates non-missing, living in communities with at least 9 women surveyed for each WEE item	Vanguard scoring (aim 1)
189,414 with complete IPV data (44 countries)	IPV analysis (aim 2, 3)
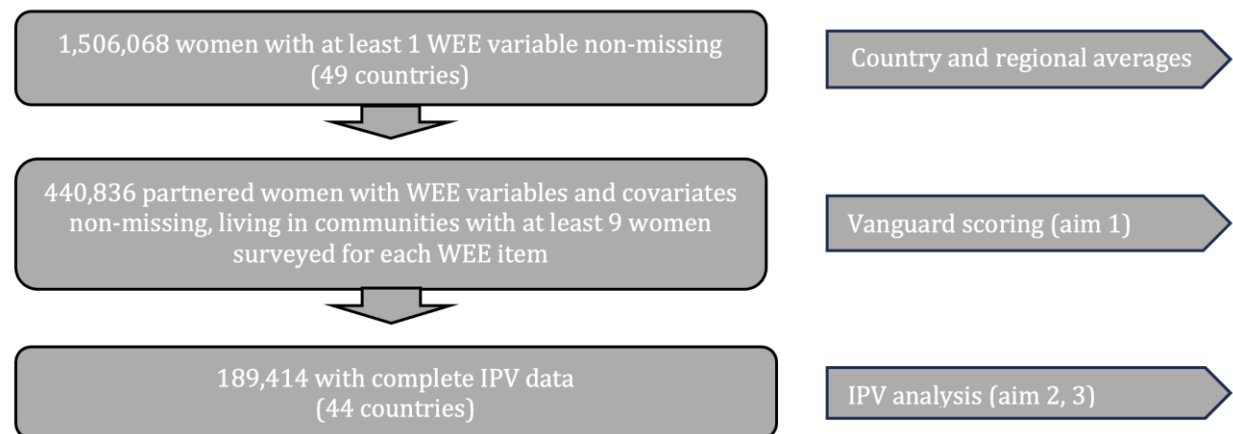
Missingness

Significant differences in demographic measures between the women excluded and

included in this analytic sample for Aim 1 were checked using logistic regression for each

demographic variable, adjusting for sampling and weighting as well as country fixed

effects. Women included in the WEE sample were significantly older ($p<0.001$), with more

children ($p<0.001$), and less likely to live in rural areas ($p<0.001$) (Table 2.2). The fact that

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[3] The only covariate with some missingness was parity, with <1% missingness.

unmarried women were excluded from the WEE sample may in part drive significant

differences. Given significant differences, all analyses adjusted for demographic variables.

Table 2.2 WEE item missingness testing (Aim 1)

	Excluded	Included	
	Missing WEE items and/ or living in a community with less than nine women surveyed for each item (n=1,052,358)	No missing WEE items and living in a community with at least nine women surveyed for each item (n=440,836)	P-value of effect[+]
Age	28.8	32.2	<0.001
Age married	18.6	19.1	0.052
Parity	1.8	3.2	<0.001
Wealth	3.1	3.1	0.568
Rural	0.62	0.61	<0.001
Married	0.56	1.00	n/a
[+] Logistic regression for each demographic variable separately, adjusting for sampling and weighting as well as country fixed effects			

The sub-sample that completed the domestic violence survey module was used for Aims 2

and 3. The DHS provision of a weight specific for the domestic violence module which

reduces concern about additional sampling bias for this analytic sample, however we

checked for demographic differences between the non-domestic violence and domestic

violence samples among women included within the WEE sample (Table 2.3). The domestic

violence sample was significantly younger (p<0.001), married older (p<0.001), with less

children (p<0.001), less wealthy (p<0.001), and less rural (p<0.001), though absolute

differences in means are minimal. Notably, there was no significant difference in the

number of WEE items on average between those included and excluded from the domestic

violence sample (p=0.871). All analyses adjusted for demographic variables.

Table 2.3 Domestic violence module missingness testing (Aim 2, 3)

	Excluded	Included	
	Did not complete the DV module (n=251,422)	Completed the DV module (n=189,414)	P-value of effect[+]
Age	32.4	31.8	<0.001
Age married	19.2	19.5	<0.001
Parity	3.3	3.1	<0.001
Wealth	3.2	3.1	<0.001
Rural	0.59	0.57	<0.001
WEE items	2.8	3.0	0.871
[+] Logistic regression for each demographic variable separately, adjusting for sampling and weighting as well as country fixed effects Among those included in the WEE sample; all women partnered			

c. <u>Measures</u>

Intimate partner violence (IPV) outcomes

All IPV measures were self-reported. The study employs three outcome measures for all

analyses: physical IPV in the past year, sexual IPV in the past year, and current partner

control. Measures are outlined in Table 2.5.

WEE items

Eight WEE items were chosen based on existing theory and practice on WEE (Table 2.5).[6-8]

Items on bank account and mobile phone ownership were considered for inclusion but

were only available in a limited set of countries (31 countries for Aim 1 and 28 countries

for Aims 2 and 3). To check for bias and ensure content validity[9] of the WEE index, a

version of the vanguard WEE index using 10 WEE proxies inclusive of mobile phone and

bank account among a sub-set of countries was constructed. The association of the 10-item

index with individual-level empowerment proxies (Aim 1) and IPV (Aim 2) was tested. We

found the same directionality and significance as the 8-item index used in this dissertation, and stronger positive magnitude and significance between vanguard WEE and past-year physical and sexual IPV when using the 10-item index. In sum, the 8-item generated index leads to a more conservative estimate of the association of vanguard WEE and physical and sexual IPV and a very similar estimate for current partner control.

Two additional items (self-employment and media exposure) were initially included and ultimately removed from the final set due to missing values in two countries and limited conceptual fit. A mobility measure, on wife-beating tolerance if a woman goes somewhere without her partner's permission, was also considered for inclusion but deemed too closely correlated with outcome measures. A second mobility measure of whether the respondent participates in the decision to visit family was also considered. Similarly, it was deemed too closely correlated with the outcome measure of partner control over respondent mobility and based on limited conceptual fit (not economically focused).

Factor analysis

Table 2.4 outputs factor analysis of the eight WEE items.[10,11] There was evidence of only one latent factor (eigenvalue > 1), and five of the eight items did not have strong factor loadings onto this factor (factor loadings < 0.40).[11] A low Cronbach's Alpha was observed for the eight items (alpha < 0.60).[12] Subsequently, there was no evidence to suggest there is one or more underlying latent factors connecting these eight items. Therefore, the dissertation treated the WEE variable as a count index rather than a scale and grouped items based on conceptual assignment. We conceptually assigned items on work,

occupation, earnings, and education to a WEE grouping of "economic resources" and the four items on decision-making to a WEE grouping of "agency."[7]

Table 2.4 WEE factor analysis

Cronbach's Alpha	0.54			
	Factor 1	Factor 2	Factor 3	Factor 4
Eigenvalues	*1.48*	*0.93*	*0.22*	*0.17*
Factor loadings				
Worked past year	0.71	-0.29	-0.01	-0.11
Earns more than husband	0.48	0.00	0.11	-0.21
Above primary education	0.18	0.23	0.22	0.21
Manager occupation	0.35	0.02	0.31	0.06
Sole DM own earnings	0.53	-0.41	-0.16	0.14
Joint DM husband's earnings	0.30	0.60	-0.08	-0.05
Joint DM household purchases	0.37	0.52	-0.15	0.01
Sole DM healthcare	0.29	-0.01	-0.10	0.22

Covariates

Covariates are outlined in Table 2.5. Covariates included in all regression analyses were: individual-level age, age of marriage, parity, household wealth, rurality, and country-level GDP per capita (current US$).[13]

National level moderator

The Women, Business, and the Law Index (WBL) is sourced from the World Bank and produced annually for over 180 economies: https://wbl.worldbank.org/en/wbl.[14] The WBL includes laws that promote or constrain 1) mobility, 2) workplace, 3) equal pay, 4) marriage, 5) parenthood, 6) entrepreneurship, 7) assets, and 8) pension (descriptions in Table 2.5). The index components were validated against "sources of national law, constitutions, codes, laws, regulations, and procedures for participating countries."[15] The

score is out of 100, and a higher WBL implies more economic agency for women. We took

the value of the WBL at the time of one year before the country's DHS survey was

conducted to allow for a slight lag.

Table 2.5 Measures summary

Variable	Use (Aim)	Formatting	Variable Description [sourced from DHS unless otherwise specified]
Outcome measures			
Past-year Physical IPV	Primary outcome (2,3)	0=none are true 1=if any items are true within the past 12 months	Spouse ever pushed, shook, or threw something. Spouse ever slapped. Spouse ever punched with fist or something harmful. Spouse ever kicked or dragged. Spouse ever tried to strangle or burn. Spouse ever attacked with knife/gun or another weapon. Spouse ever twisted her arm or pulled her hair.
Past-year Sexual IPV	Primary outcome (2,3)	0=none are true 1=if any items are true within the past 12 months	Spouse ever physically forced sex when not wanted. Spouse ever forced other sexual acts when not wanted.
Current Partner Control	Primary outcome (2,3)	0=none are true 1=if any items true	Does not permit her to meet her girlfriends. Husband tries to limit her contact with family. Husband insists on knowing where she is.
WEE measures			
Work	For independent variable	0= women who did not work in the past year	Whether the respondent worked in the last 12 months

	vanguard WEE index	1=women who worked in the past year	
Earn	(1,2,3) and the WEE count index, used as a	0= women who earned less than husband or had no earnings 1=women who earned the same or more than their husband	Whether respondent earns more than or the same as her husband
Occupation	confounder in inference analysis (1,2,3)	0= women who did not work in professional/technical/managerial positions or did not work 1=women who worked in a professional/technical/managerial position	Standardized respondent occupation groups
Education		0=women who did not have above primary education 1=women who had above primary education	"Highest education level attended. This is a standardized variable providing level of education in the following categories: No education, Primary, Secondary, Higher. In some countries the educational system does not fit naturally within this scheme and a different categorization was used for the Final Report. In this case, this variable is constructed as accurately as possible from the country's own scheme"[4]
Decision-making: own earnings		0=women who did not decide alone or had no earnings 1=women who decided alone about how to spend their earnings	The person who mainly decides how the money earned by the respondent is used.
Decision-making: husband's earnings		0=women who did not participate 1=women who participated in decision on how to spend their husband's earnings	Final say in the family on the following decisions: What to do with money husband earns
Decision-making: household purchases		0=women who did not participate 1=women who participated in decisions on household purchases	Final say in the family on the following decisions: Making large household purchases
Decision-making: seeking healthcare		0= women who did not decide alone	Final say in the family on the following decisions: Respondent's health care

		1=women who decided alone about whether to seek healthcare for herself	
Covariates			
Age	Independent variable (1) and potential confounder (2,3)	0= 18 or under 1= 19 to 25 2= 26 to 35 3= 36 to 45 4= above 45	Age at time of survey
Age of marriage	Independent variable (1) and potential confounder (2,3)	0= less than 16 1= 16 to 20 2= 21 to 25 3= Above 25	Age of first cohabitation, among married and cohabiting women
Parity	Independent variable (1) and potential confounder (2,3)	0= no children 1= 1-2 children 2= 2-5 children 3= >5 children	Total children ever born
Household wealth index	Independent variable (1) and potential confounder (2,3)	DHS index of 1 [poorest] – 5 [wealthiest]	The household-level wealth index is calculated using data on household assets, household construction materials, and water and sanitation factors.
Rurality	Independent variable (1) and potential confounder (2,3)	0= urban 1= rural	Urban/ rural
Married	Independent variable (1)	0= never in union or formerly in union/ living with a man 1= currently in union/ living with a man	Currently/formerly/never in union
GDP per capita (current US$)	Independent confounder (1,2,3)	Country level, at the country's year of DHS Survey: "GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of	

		fabricated assets or for depletion and degradation of natural resources" *Sourced from the World Bank[13]*
Moderators		
Women, Business, and the Law Index (WBL)	Potential moderator (3)	Country-level, one year prior to country's year of DHS Survey: A validated index capturing the level of legal protections for women's economic participation, covering gender-equitable legislation with sub-indices on mobility, work opportunity, equal pay, marriage, parenthood, entrepreneurship, assets, and pension. *Sourced from the World Bank*
WBL subindex: mobility		Country-level, one year prior to country's year of DHS Survey: 1) Can a woman choose where to live in the same way as a man? 2) Can a woman travel outside her home in the same way as a man? 3) Can a woman apply for a passport in the same way as a man? 4) Can a woman travel outside the country in the same way as a man?
WBL subindex: workplace		Country-level, one year prior to country's year of DHS Survey: 1) Can a woman get a job in the same way as a man? 2) Does the law prohibit discrimination in employment based on gender? 3) Is there legislation on sexual harassment in employment? 4) Are there criminal penalties or civil remedies for sexual harassment in employment?
WBL subindex: pay		Country-level, one year prior to country's year of DHS Survey: 1) Does the law mandate equal remuneration for work of equal value? 2) Can a woman work at night in the same way as a man? 3) Can a woman work in a job deemed dangerous in the same way as a man? 4) Can a woman work in an industrial job in the same way as a man?
WBL subindex: marriage		Country-level, one year prior to country's year of DHS Survey: 1) Is there no legal provision that requires a married woman to obey her husband? 2) Can a woman be head of household in the same way as a man? 3) Is there legislation specifically addressing domestic violence? 4) Can a woman obtain a judgment of divorce in the same way as a man? 5) Does a woman have the same rights to remarry as a man?
WBL subindex: parenthood		Country-level, one year prior to country's year of DHS Survey: 1) Is paid leave of at least 14 weeks available to mothers?

		2) Does the government administer 100% of maternity leave benefits? 3) Is there paid leave available to fathers? 4) Is there paid parental leave? 5) Is dismissal of pregnant workers prohibited?
WBL subindex: Entrepreneurship		Country-level, one year prior to country's year of DHS Survey: 1) Does the law prohibit discrimination in access to credit based on gender? 2) Can a woman sign a contract the same way as a man? 3) Can a woman register a business in the same way as a man? 4) Can a woman open a bank account in the same way as a man?
WBL subindex: mobility		Country-level, one year prior to country's year of DHS Survey: 1) Do men and women have equal ownership rights to immovable property? 2) Do sons and daughters have equal rights to inherit assets from their parents? 3) Do male and female surviving spouses have equal rights to inherit assets? 4) Does the law grant spouse equal administrative authority over assets during marriage? 5) Does the law provide for the valuation of nonmonetary contributions?
WBL subindex: Pension		Country-level, one year prior to country's year of DHS Survey: 1) Is the age at which men and women can retire with full pension benefits the same? 2) Is the age at which men and women can retire with partial pension benefits the same? 3) Is the mandatory retirement age for men and women the same? 4) Are periods of absence due to childcare accounted for in pension benefits?

d. Statistical analysis

Model considerations and construction

The multi-country data is hierarchical and clustered, with individuals nested within

communities (PSU), which are nested within sampling strata (unique to geographic region

and urban/ rural), which are nested within countries. Being in the same geographic

location may result in correlated responses, which violates the assumption of ordinary

regression that responses are conditionally independent given other factors in the model.

Therefore, this dissertation employed a multi-level mixed effects modeling approach.[16]

The ICCs for each IPV outcome across community and strata were computed to evaluate

the need for random intercepts.[17] ICCs are not expected to be close to 0, meaning that the

proportion of variance in IPV accounted for by the clustering across communities and

regions is meaningful, indicating a need to account for clustering in models through

random intercepts.[18] The ICCs for each of the three IPV outcomes are outlined in Table 2.6,

which demonstrate evidence of clustering (ICC > 0.05) within both strata and community

and the need to adjust for sample strata and community random effects. Applying random

intercepts allows each woman to have her own log odds of IPV dependent on her

community and strata residence. In other words, we expect and allow for women's IPV risk

to be correlated with the risk of other women in her community. Random effects adjust for

unobserved latent variables that account for the correlation among women within both

strata and communities.[19]

Table 2.6 Clustering of dependent variables

	Community ICC	Strata ICC
Past-year Physical IPV (n= 306,815)	0.165	0.129
Past-year Sexual IPV (n= 306,781)	0.100	0.067
Current Partner control (n= 305,846)	0.192	0.132

Given the requirements of 1) logistic regression due to all dependent variables being

binary, 2) the need to adjust for survey weighting, and 3) the need to adjust for clustering

at the strata and community levels, the STATA command "melogit" was used for all

inferential models.[20] Models would not run with three random intercepts (country, strata,

community); therefore, models adjusted for country fixed effects so that women are

compared to women within their own country. A three-level (individual, community,

strata) mixed effects multilevel logistic regression model with country fixed effects was

used with pooled country data. In using mixed effects models, models identify the effect

found in an average person (how does a woman's risk of IPV increase if her behavior is

more vanguard), which is different from the population-averaged effect (how many more

cases of IPV if vanguard WEE increased across the population). Model 1 outlined below is

the base model used for all analysis in the dissertation.

Model 1:
$\text{Log(odds}(Y_{ijk}=1)) = B_0 + b_{oi} + b_{oij} + B_1 GDP + X_{ijk} + \delta + \varepsilon_{ijk}$
Where:
$\varepsilon_{ijk} \sim N(0, \sigma^2)$
$b_{oi} \sim N(0, \gamma^2)$, independent of ε_{ijk} and b_{oij}
$b_{oij} \sim N(0, \tau^2)$, independent of ε_{ijk} and b_{oi}
Y_{ijk} =individual-level outcome for respondent k, nested in community j, nested in strata i
B_0 =log odds of the outcome for women with the minimum value of covariates, living in the community and strata with the average random effects ($b_{oi} = b_{oij} = 0$), adjusting for country fixed effects and country GDP
b_{oij} =community random intercept –the difference from the average effect for community j, assumed to be normally distributed around 0 with a variance of γ^2
b_{oi} =strata random intercept –the difference from the average effect for strata i, assumed to be normally distributed around 0 with a variance of τ^2
B_1=difference in the log-odds of the outcome comparing individuals living in places with a one-unit difference in GDP, adjusting for any strata- and community-level differences, covariates, vanguard WEE, and country fixed effects
X_{ijk}=vector for individual covariates (age, age of marriage, parity, wealth, rurality)
δ =are fixed effects for country (number of countries=49)
ε_{ijk}=within strata, community, and individual residual with variance σ^2

Inferential estimates were presented as marginal effects with 95% confidence intervals unless otherwise specified. In reporting the marginal effect after logistic regression, the average percentage point increase in the outcome by one unit change in the independent variable is provided. Power calculations in PASS software determined sufficient power given the outcome rate, ICC of each outcome, number of communities, and number of women per community on average. In fact, given the large sample sizes, the study might be over-powered and therefore estimates will more likely come up as significant. Therefore, it is important to consider the significance of the effect sizes in practice, in addition to the p-values.

Aim 1: Vanguard WEE Index development and validation

The objective of Aim 1 was to construct the vanguard WEE index by counting how many WEE items a woman has while living in a community that is non-normative on the item through applying 1) two threshold dyads, in which all communities under the lower threshold were labeled as non-normative and all communities above the higher threshold were labeled as normative and 2) two approaches for assigning middle-prevalence communities as normative or non-normative. Sub-aims were to explore the vanguard WEE index's validation and identify the characteristics of vanguard women. The analytic sample for the vanguard WEE index was women who had all WEE items and covariates non-missing, living in communities where at least nine women were surveyed for each WEE item (n=440,836).

Defining the reference group and exploring group sizes

The reference group for WEE norms was the geographic area where the respondent lived at the time of the survey, identified as the PSU by the DHS and defined as the community within this dissertation. There must be enough sampled women within the reference group to accurately identify the descriptive norm based on prevalence. In a review of 26 studies that created community norms measures based on aggregating individual-level measures, only six discussed community sample size and excluding groups based on the number of observations per group. Among those who reported on restricting groups, a group size of 10 was the median and mode, with one study setting the minimum cutoff to 5 observations.[21] There is no established guideline for the cutoff. A minimum of 10 per community was initially explored, based on the median of the 6 studies reviewed.[21-27] However, similar findings for main results of Aims 1, 2, and 3 were found when using a cutoff of 9 per community. Further, restricting based on 10 compared to 9 led to 23,208 observations and 1,559 communities dropped. Therefore, a 9 per community cutoff was employed. Table 2.7 outlines the distribution of the community-level observations, ranging from 9 to over 100, used to identify the community norm in this dissertation.

Table 2.7 Distribution of community observations by WEE item, community-level

	Mean size	SD	Min	Max
Worked past year (n=39,313)	22.3	9.9	9	170
Earns more than husband (n=33,826)	18.3	8.0	9	128
Above primary education (n=59,747)	25.0	8.0	9	170
Manager occupation (n=39,289)	22.3	9.9	9	170
Joint DM husband's earnings (n=30,941)	17.2	7.3	9	146
Joint DM household purchases (n=33,233)	17.0	7.2	9	146
Sole DM own healthcare (n=33,232)	17.0	7.2	9	146
Sole DM own earnings (n=33,826)	18.3	8.0	9	128

Constructing "vanguard WEE"

Few studies have statistically labeled communities as normative or non-normative using prevalence. Seff et al. (2022) assessed the distribution of community-level prevalence and labeled communities whose prevalence fell in the bottom two-thirds of the distribution as non-normative, cited and discussed in the *Lancet Gender, Equity, Norms and Health Series* piece *Gender norms and health: insights from global survey data*.[28,29] Metheny et al. (2020) labeled a community as non-normative if the community prevalence was less than or equal to the regional prevalence.[30] Goldenberg et al. (2019) defined a community as non-normative on an item if less than 50% of people had the item.[31] Heise and Kotsadam (2015) looked at the distribution of survey-level prevalence of women working across DHS surveys and split surveys by lowest 20th percentile vs. top 80th percentile.[32]

Given the prevalence of each WEE item across the 49 countries varied from very low to very high, thresholds to assign communities as normative or non-normative regardless of regional or country prevalence were created. Two different threshold dyads: <0.25 for non-normative, >0.75 for normative and <0.35 for non-normative, >0.65 for normative were tested. Next, for communities with prevalence that fell within the two thresholds, two approaches for assigning communities as normative or non-normative were applied. The first approach labeled a community as non-normative if the community's prevalence was in the bottom two-thirds of the community-level distribution within the region, as done by Seff et al. (2022).[28] The second approach labeled a community as non-normative if the community's prevalence was less than the regional prevalence, as was done by Metheny et al. (2020) using national prevalence.[30]

Being vanguard on an item was an individual-level binary measure of having the item and living in a non-normative community compared to having the item and living in a normative community or not having the item. For each WEE item separately, the percentage of women who were vanguard on the item among the sample who had the item was explored. The difference in percent vanguard among those who had the item for each WEE item was assessed: 1) between measures that used different threshold dyads but the same approach for mid-prevalence communities and 2) between measures that used different approaches for middle-prevalence communities but the same threshold dyads. The number of items for which a woman was vanguard was summed up to create the proposed indices. Indices were count variables ranging from 0 (no vanguard items) to 8 (has all WEE items and vanguard on all WEE items). Four indices were generated using combinations of two threshold dyads and two approaches for handling mid-prevalence communities.

Assessing validity of the vanguard WEE index

To compare the four indices and assess the validity of our approach, their distributions were plotted together on a line graph. The bivariate association between each index and a set of demographics (age, age of marriage, parity, wealth, and rurality) was tested using Pearson's correlation coefficient adjusting for survey weights. The intraclass correlation coefficient (ICC) was explored. The ICC provides information on how clustered a measure is, as in, it compares how much units within a group resemble each other and how much units across groups resemble each other.[28] A very low ICC would mean that all

communities have about the same proportion of WEE. A high ICC would mean items are very clustered, suggesting normative influence.[28] While there exists no established cutoff,[18] the threshold to claim normative influence was an ICC greater than or equal to 0.05 for WEE items. For vanguard indices, the threshold to claim that there is enough variability within communities, or not too much clustering, for analysis was an ICC less than or equal to 0.25.

Based on the ICC, variability, and differences in percent vanguard between approaches and thresholds, one vanguard WEE index was chosen to move forward with. To test the criterion validity of the selected vanguard WEE index, the index was associated with proxies for access to information, agency over mobility, and national-level gender financial gender discrimination. Associations were measured by mixed effects linear regression adjusting for survey weighting, number of WEE items, age, wealth, rurality, country fixed effects, and strata and community random effects. It was hypothesized that empowered women, as measured by access to information and agency over mobility, would be more likely to be more vanguard, adjusting for WEE status. It was hypothesized that more discriminatory settings would have higher vanguard WEE status on average, adjusting for WEE status, given these places are less normative on women's economic participation.

Characteristics of vanguard women

The chosen index was associated with age, age of marriage, parity, wealth, and rurality using mixed effects linear regression, adjusting for survey weighting, strata and community random effects, and the respondent's number of WEE items. For a select set of WEE items

that were measured among both married and unmarried women, the design-based F-statistic adjusting for weighting and survey sampling was used to compare the proportion of women vanguard by marital status.

Aim 2: Multilevel association between vanguard WEE and IPV

Aim 2 cross-sectionally examined the relationship between IPV and vanguard WEE, hypothesizing that having more vanguard WEE items would be positively associated with IPV. The sub-aim explored whether household wealth moderated the vanguard WEE-IPV relationship. The analytic sample was 189,414 partnered women across 44 countries who participated in the domestic violence module and had no missing WEE or covariate items, living in communities where at least nine women were sampled on each WEE item.

Univariate and Bivariate Exploratory

The sample breakdown by age, age of first marriage, parity, wealth, rurality, number of WEE items (coded as 0, 1, 2, and 3 or more), and the number of vanguard WEE items (coded as 0, 1, 2, and 3 or more vanguard WEE items) was explored. For each of these measures, the weighted average of past-year physical IPV, past-year sexual IPV, and current partner control for each level was estimated. The bivariate associations between each measure and each outcome were assessed using the design-based F-statistic to control for weighting and survey design.

Multilevel modeling prep for associations with vanguard WEE

For analysis associating vanguard WEE with outcomes, we first explored whether we need random slopes for vanguard WEE across communities in addition to random intercepts. Random slopes allow the effect of the independent variable (vanguard WEE) on the outcome variable (IPV) to be heterogeneous across communities. In this case, communities would not only vary in their average odds of the outcome (through random intercepts) but also in their change in odds of the outcome related to the fixed effects of the independent variable (random slopes). Given that the analysis is based on the influence of community norms, we would expect variability in how vanguard WEE and the outcomes relate across different communities. Applying a random slope of vanguard WEE to communities allows the estimate to be the average effect of vanguard WEE across all communities, conditional on covariates. To test this assumption, models were run with and without random slopes with likelihood ratio testing of model fit. We found that cluster-based variation of the effect of vanguard WEE improves model fit ($p<0.001$). Therefore, random slopes were included in all models that had vanguard WEE as the primary independent variable. Unstructured covariance was specified to not assume the two random-effects terms are independent.

We further tested the community contextual effect of vanguard by running the models with a community-average vanguard WEE measure, in addition to individual-level vanguard WEE as the independent variable for each outcome variable. Within this specification, the individual-level vanguard WEE measure represents the within effect: the difference in log odds of an individual experiencing IPV for each unit-increase in vanguard WEE items, within a given community, within a given strata. The community-level vanguard WEE

measure represents the contextual effect: the difference in log odds IPV between two women with the same vanguard WEE score but live in communities that differ by one unit in average vanguard WEE score. If the contextual effect is not significant, then we can infer that the within- and between-effects of vanguard WEE are about the same, as the between effect equals the within effect plus the contextual effect. The total effect is the weighted average of between and within; if there's a contextual effect, then the within effect differs from the between effect. For all three outcomes, the contextual effect (the coefficient of the community mean vanguard WEE) was not significant: p=0.249, p=0.756, p=0.097 for past-year physical IPV, past-year sexual IPV, and current partner control, respectively. These findings mean an estimate of the "total effect" using only the individual-level vanguard WEE measure will not be much different from the true within-effect, and we, therefore, did not cluster mean-center the independent variable in subsequent analysis. Model 2 outlined below is the logistic mixed effects model used in Aim 2.

Model 2:
$$\text{Log(odds}(Y_{ijk}=1)) = B_0 + b_{oi} + b_{oij} + (B_1 + b_{1ij})\text{vanguard}_{ijk} + B_2\text{WEE}_{ijk} + B_3\text{GDP} + X_{ijk} + \delta + \varepsilon_{ijk}$$
Where:
$\varepsilon_{ijk} \sim N(0, \mu^2)$
$b_{oi} \sim N(0, \gamma^2)$
$b_{oij} \sim N(0, \tau_0^2)$, $b_{1ij} \sim N(0, \tau_1^2)$, $Cov(b_{oij}, b_{1ij}) = \sigma^2$
$Cov(b_{0i}, b_{0ij}) = 0$, $Cov(b_{1ij}, b_{oi}) = 0$
Y_{ijk}= individual-level outcome for respondent k, nested in community j, nested in strata i
B_0=log odds of the outcome for women with the minimum value of covariates and vanguard, living in the community and strata with the average random effects ($b_{oi} = b_{oij} = 0$), adjusting for country fixed effects
b_{oij}=community random intercept – the difference from the average intercept for community j, assumed to be normally distributed around 0 with a variance of γ^2
b_{oi} =strata random intercept –the difference from the average intercept for strata i, assumed to be normally distributed around 0 with a variance of τ_0^2

B_1 =average change across communities in the log-odds of the outcome associated with a one-unit increase in vanguard, adjusting for any strata- and community-level differences, country fixed effects, GDP, and individual covariates
b_{1ij} =random slope for vanguard across communities – the difference from the average effect of vanguard for community j, assumed to be normally distributed around 0 with a variance of τ_1^2
B_2=difference in the log-odds of the outcome comparing individuals with a one-unit difference in number of WEE items, adjusting for any strata- and community-level differences, vanguard, GDP, covariates, and country fixed effects
B_3=difference in the log-odds of the outcome comparing individuals living in places with a one-unit difference in GDP, adjusting for any strata- and community-level differences, covariates, vanguard, and country fixed effects
X_{ijk}=vector for individual covariates (age, age of marriage, parity, wealth, rurality)
δ =are fixed effects for country (number of countries=44)
ε_{ijk}=within strata, community, and individual residual with variance μ^2

Marginal effects and marginal probabilities of IPV by vanguard WEE breakdown were

presented.

Moderation by wealth

For each outcome, the interaction between vanguard WEE and household wealth was

tested by adding a categorical-by-categorical interaction term of wealth and vanguard WEE

to Model 2. For significant interactions, the marginal probabilities of IPV onto wealth were

mapped onto a line graph stratified by 0 vanguard WEE items, 1 vanguard WEE item, 2

vanguard WEE items, and 3 or more vanguard WEE items to see IPV disparity by vanguard

WEE at each wealth-level separately.

Sensitivity analysis

Sensitivity analyses were conducted to validate findings using two other ways to measure

vanguard WEE within Model 2. The alternate vanguard WEE indices were: 1) the same

35%/65% threshold dyad for non-normative and normative communities but a different approach for assigning middle-prevalence communities, in which a community with prevalence between 35% and 65% was labeled non-normative for an item if the community prevalence less than the regional average prevalence and 2) the same approach for assigning middle-prevalence communities but a different threshold dyad of 25%/75%.

By-country analysis

Using a two-level model of individual and community, adjusting for strata fixed effects, models were run for each country separately. Due to convergence constraints among smaller samples, random slopes for vanguard WEE across communities were not included within country-stratified regressions. The marginal effect estimates were presented graphically in forest plots for past-year physical and sexual IPV and current partner control separately.

Further sensitivity checks

Using vanguard WEE as a continuous measure (0-8), a margins plot was constructed to map the predicted increase in the probability of each IPV measure across the full vanguard WEE index adjusting for covariate measures. The dissertation reported effect estimates as marginal effects for interpretability. The output of the associations of interest using OLS regression and odds ratios was provided as sensitivity checks. Odds ratios were also reported comparing any vanguard WEE items to no vanguard WEE items. Further, we

graphically explored the relationship between country-level WEE and country-level IPV to understand the WEE-IPV relationship (Annex Figure 7.4).

Aim 3: National-level moderation of vanguard WEE and IPV

The objective of Aim 3 was to assess whether national laws promoting women's economic participation, as measured by the WBL, moderate the relationship between IPV and going against the norm in economic participation cross-sectionally across 44 low- and middle-income countries. The analytic sample was 189,414 partnered women who participated in the domestic violence module and had no missing WEE or covariate items, living in communities where at least nine women were sampled on each WEE item.

Univariate and Bivariate Exploratory

The sample breakdown and IPV prevalence by demographic measures and vanguard WEE (coded as 0=no vanguard WEE items vs. 1=one or more vanguard items) was explored. Bivariate correlations between outcomes and demographic measures were tested using the design-based F statistic adjusting for weighting and survey sampling. Average WEE, percent with any vanguard WEE items, and WBL by country were explored and presented.

Multilevel analysis

The WBL and individual WBL sub-indices were associated with vanguard WEE, past-year physical IPV, past-year sexual IPV, and current partner control using logistic mixed effects models accounting for survey weighting, number of WEE items, age, age of marriage, parity,

wealth, rurality, and country GDP. Due to collinearity issues, country fixed effects were not

adjusted for in Aim 3. The interaction of vanguard WEE with the WBL and WBL sub-indices

were regressed on each outcome separately. For Aim 3 analysis, Model 3 outlined below

with an interaction term between the WBL and vanguard WEE was used.

Model 3:
$$\text{Log(odds}(Y_{ijk}=1)) = B_0 + b_{oi} + b_{oij} + (B_1 + b_{1ij})\text{vanguard}_{ijk} + B_2\text{WEE}_{ijk} + B_3\text{GDP} + B_4\text{WBL} + B_5\text{vanguard}_{ijk}\#\text{WBL} + X_{ijk} + \varepsilon_{ijk}$$

Where:

$\varepsilon_{ijk} \sim N(0, \mu^2)$

$b_{oi} \sim N(0, \gamma^2)$

$b_{oij} \sim N(0, \tau_0^2)$, $b_{1ij} \sim N(0, \tau_1^2)$, $Cov(b_{oij}, b_{1ij}) = \sigma^2$

$Cov(b_{0i}, b_{oij}) = 0$, $Cov(b_{1ij}, b_{oi}) = 0$

Y_{ijk}=individual-level outcome for respondent k, nested in community j, nested in strata i

B_0=log odds of the outcome for women with the minimum value of covariates, vanguard, and WBL, living in the community and strata with the average random effects ($b_{oi} = b_{oij} = 0$)

b_{oij}=community random intercept – the difference from the average intercept for community j, assumed to be normally distributed around 0 with a variance of γ^2

b_{oi}=strata random intercept –the difference from the average intercept for strata i, assumed to be normally distributed around 0 with a variance of τ_0^2

B_1=average change across communities in the log-odds of the outcome associated with a one-unit increase in vanguard in countries with the lowest WBL, adjusting for any strata- and community-level differences, GDP, and individual covariates

b_{1ij} =random slope for vanguard across communities – the difference from the average effect of vanguard for community j, assumed to be normally distributed around 0 with a variance of τ_1^2

B_2=difference in the log-odds of the outcome comparing individuals with a one-unit difference in number of WEE items, adjusting for any strata- and community-level differences, vanguard, GDP, covariates, and country fixed effects

B_3=difference in the log-odds of the outcome comparing individuals living in places with a one-unit difference in GDP, adjusting for any strata- and community-level differences, covariates, vanguard, and GDP

B_4=difference in the log-odds of the outcome comparing individuals with a one-unit difference in WBL (or sub-index) when vanguard equals 0, adjusting for any strata- and community-level differences, GDP, and individual covariates

B_5=interaction effect of the WBL and vanguard: the difference between the log odds ratios corresponding to a one-unit increase in vanguard for two women who differ by 1 unit in the WBL, holding constant covariates and random effects

X_{ijk}=vector for individual covariates (age, age of marriage, parity, wealth, rurality)

ε_{ijk}=within strata, community, and individual residual with variance μ^2

The marginal effects for all significant interactions (B_5 with p-value < 0.05) were displayed graphically.

e. <u>Ethical approval</u>

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board determined this dissertation does not qualify as human subjects research due to secondary data analysis and waived IRB submission.

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3. Chapter Three: Who are the vanguard women? Strategies for identifying women going against economic participation norms across 49 low- and middle-income countries

   a. <u>Abstract</u>

Background: Gender and poverty are two key social determinants of health. Ensuring women have equal rights to economic resources is a cornerstone of Goal 5 of the Sustainable Development Goals on gender equality. A knowledge gap persists on how women's individual-level economic behavior has differing effects on wellbeing depending on the normative environment of women's economic participation. As such, there is a stark need for improved measurement of individual-level compliance with local norms.

Objectives: The objectives of this study are to 1) compare strategies for generating a "vanguard WEE" index that captures the extent to which a woman is going against the community norm on economic participation, 2) explore the validity of the index, and 3) explore characteristics of women who go against the norm.

Study sample: Data from the Demographic and Health Surveys (DHS) for 49 countries from 2013-2021 were used to generate country and regional prevalence for eight women's economic empowerment proxies. The analytic sample was restricted to women for whom no items were missing and living in a community with at least nine women surveyed for each item (n= 440,836).

Methods: For each WEE item, threshold dyads were applied in which all communities under the lower threshold were labeled as non-normative and all communities above the higher threshold were labeled as normative. For each threshold dyad, two approaches were used to assign middle-prevalence communities as normative or non-normative. A

woman was labeled as vanguard for an item if she had the item and lived in a community that was non-normative for that item. Indices summed up the number of items a woman was vanguard on. One of the four approach-threshold combination indices was selected for further analysis based on intra-class correlation, variability, and differences from other indices. Criterion validity was assessed by association with a measure of national gender economic discrimination and two empowerment proxies. Characteristics of vanguard WEE women were assessed through multilevel mixed effects modeling.

Results: The four approach-threshold combination indices generated similar vanguard distributions, though threshold was impactful for low-prevalence items. The vanguard WEE index for further analysis employed a 35%/65% threshold dyad for non-normative/normative communities and a middle-prevalence community approach of assigning the bottom two-thirds of communities within a region as non-normative (mean: 1.1, standard deviation: 1.2). In line with our hypothesis, the chosen index was significantly associated with greater national-level gender financial discrimination and with a women's agency proxy ($p<0.001$), suggesting criterion validity. Vanguard WEE associated with increased age (B 0.02, 95% CI (0.01, 0.02)), decreased age of marriage (B -0.01, 95% CI (-0.01, 0.00)), decreased wealth (B -0.01, 95% CI (-0.01, -0.01)), and rurality (B 0.24, 95% CI (0.21, 0.27)).

Discussion: The study explores how varying prevalence thresholds and approaches for labeling communities as non-normative impact the percentage of women labeled as going against economic participation norms among a large generalizable population of women. Findings suggest validity of the vanguard WEE index. Older and poorer women were more likely to go against the norm in economic participation. This study offers a valid

measurement method and conceptualization of going against the community norm on economic participation across diverse low- and middle-income settings.

a. <u>Background</u>

Gender and poverty are two of the most influential social determinants of health.[1,2] The two are interlinked: social systems often confer differential economic access and power levels based on gender. Globally, women earn less, are less educated, have a higher disease burden, and experience less political, economic, and social authority than men.[3] In light of this, the United Nations characterizes women's economic empowerment (WEE) as a cornerstone of the Sustainable Development Goals.[4,5] WEE is understood to improve the health and wellbeing of women through both alleviating poverty and improving gender equality.[6] As such, many governments and organizations have invested in women's empowerment agendas, and efforts to economically empower women in low- and middle-income countries have boomed in the past few decades.[7,8]

Empowerment is a broad term used to capture the process by which people gain the ability to make decisions about their life.[9] Kabeer (2016) described empowerment as "*the processes by which those who have been denied the capacity for choice gain this capacity*."[8] Empowerment, therefore, is a process of social change. If we assume personal choice is a goal for everyone, empowerment is a process of social justice. Economic empowerment is a specific form related to having power over financial resources and productivity. WEE is the process by which women gain access to economic opportunity, and the decision-making

power to dictate their participation in such economic opportunity, with the goal of reaching

levels similar to that of men to achieve desired wellbeing outcomes.[9,10]

 Gender norms largely affect whether women are denied or provided with the power of

choice over economic resources, and subsequently interact with how WEE relates with

wellbeing and health outcomes.[11] However, few studies on WEE have integrated the role of

WEE community norms in their measurement of WEE at the individual level.[12,13]

Understanding not only rates of WEE but also areas of the globe where WEE is not

normative, and the proportion of women going against the norm on economic participation

therein, is a persistent gap in the literature. The gap is partly due to the challenges around

conceptualizing and labeling settings as "normative." While social norms are widely

recognized as important to consider, few study interrogate the measurement of social

norms.[14] For instance, in a review by Mackie et al. (2015) of 173 studies that used social

norms theory, only 14% explicitly measured norms.[15]

Social norms theory defines a social norm as an implicit or explicit rule of the

appropriateness of a behavior, and gender norms are a type of social norms dictating what

is appropriate for different genders.[16] Injunctive norms are the level of approval of a given

behavior and descriptive norms as the prevalence of a given behavior.[17,18] Ideally, to

determine whether a specific behavior is normative, one would have both the injunctive

norm (such as the level of agreement with the statement: "most people in my community

think it's ok for a woman to start her own business" among people within the reference

group) and the descriptive norm (a percentage of the women within the reference group

who started their own business). There is variability across disciplines in discussing social norms as individual constructs (beliefs[19], interpretations of rules[20]) versus collective constructs (a social phenomenon within a group,[21] a pattern of behavior observed at a population-level[22]). In this study, we explore the descriptive norm as a collective construct.[23]

The concept of a reference group is fundamental to studying social norms as a collective construct.[14,24] Mackie et al. (2015) outline that social norms are sustained by the "*reciprocal expectations of the people within a reference group*," and this interdependence perpetuates a norm.[15] Despite the widespread understanding of norms reference groups, there is a lack of consistency in how studies identify reference groups to ensure they capture normative influence.[14] Weber et al. (2019) suggest that researchers assess the intraclass correlation coefficients (ICCs) across proposed reference groups to understand level of clustering, with high clustering implying normative influence.[25]

With reference groups established, few studies have provided strategies for labeling settings as "normative" vs. "non-normative" based on the descriptive norm. Metheny et al. (2020) studied positive deviance on gender equality-related outcomes, such as having higher education and reduced parity compared to the local norm.[26] The authors quantify positive deviance as having a characteristic when the proportion of women in the community who also have the characteristic is less than or equal to the characteristic's national average. Other work has labeled communities as non-normative for an item if they fall in the bottom two-thirds of the distribution of community-level prevalence for that

item.[14,25] Others have done a more straightforward approach and labeled communities as non-normative on an item if less than 50% of people have that item.[27] Other studies avoid a binary measure and separate communities as least normative, normative, more normative, etc., based on the prevalence distribution.[28] Labeling settings as normative or non-normative using prevalence measures for norms remains a persistent methodological challenge in the literature. Chung and Rimal (2016) highlight the importance of standardizing the operationalization of norms across research to understand their effect on behavior.[29]

This paper presents a methodological approach for measuring WEE normalization to identify women going against the norm, using eight commonly used WEE proxies across 49 low-and middle-income countries. The study explores the clustering of WEE items across social norms reference groups and proposes four different indices, encompassing two prevalence thresholds for non-normative settings and two approaches for labeling middle-prevalence settings, and compares these indices to each other to contribute insight into strategies for labeling women as "vanguard" on WEE. The study further validates the vanguard WEE index and examines the characteristics of vanguard WEE women across contexts.

b. Methods

Data

Sample

The data came from the Demographic and Health Surveys (DHS) for 49 countries. Inclusion criteria for country surveys were: 1) conducted since 2013 for time relevance and 2) includes all eight WEE variables. The latest survey was used if a country had multiple surveys within the past ten years. The DHS sample is representative at the national, urban/rural, and regional levels.[30] First, DHS stratification divides the sampling frame into strata homogonous on geographic region and urban/ rural. DHS stratification aims to reduce sampling errors. The household survey employs a two-stage cluster sampling procedure. Primary-sampling units (PSU) are selected within each stratum based on probability proportional to population size. For this study, the DHS PSUs define communities. A complete household listing is acquired for each community and a set number of households is selected by equal probability systematic sampling within each cluster. All women aged 15-49 (in a select few country cases, up to 64) within selected households complete the women's questionnaire.

The sample for constructing the country and regional averages for each WEE variable was individual women with at least one WEE item that does not have a missing value (n=1,506,068). The sample for constructing community averages for each WEE variable was restricted to communities with at least nine women surveyed for that WEE item; this sample varies for each WEE item. In a review of 26 studies that created community proxy

measures for norms, only six discussed community sample size and excluded groups based on the number of observations per group.[31] There is no established guideline for the cutoff. We initially explored a minimum of ten per community, which was the median of the six studies reviewed. However, we found similar findings for main results when using a cutoff of nine per community and restricting to ten compared to nine led to 23,208 observations and 1,559 communities dropped. Therefore, the analytic sample for index development was restricted to the sample of women for which no WEE items are missing, no covariate values missing, and living in communities where at least nine women were surveyed for each WEE item (n= 440,836).

Weighting and clustering

All descriptive and inferential analyses used the DHS weight for individual women. The DHS individual woman weight requires re-normalizing when pooling countries into one dataset due to the different survey sizes across countries. Country surveys vary considerably by size; for instance, the India survey sample is 48,755, whereas the South Africa survey sample is only 378. Without weight normalizing, one country could drive effects within the pooled analysis. Weights were normalized so that each country survey is given equal weight by multiplying each original weight by ((the total pooled sample/ number of surveys) / the sample size in the country survey).

The data are hierarchical, with individuals nested within communities, which are nested within strata, nested within countries. Given the data's clustering, random intercepts were applied for all statistical models for both strata and community. Random effects adjust for

unobserved latent variables that account for the correlation among women within both strata and communities. All analyses adjusted for country fixed effects, so women were compared to women within their own country.

Measures

WEE proxies

Across studies, standard measures of WEE include financial decision-making power, access to money, financial independence, financial literacy, and indicators of economic positioning such as employment.[32,33] In a data-driven approach, this study uses eight commonly used WEE proxies outlined in Table 3.1. Prevalence estimates of WEE items spanned from as low as 6.3% for managerial occupations to 66.1% for participating in household purchase decisions (Table 3.1). Theorists have asserted that the WEE process comprises resources and agency working together to lead to wellbeing achievements.[9] Based on conceptual discussions, we grouped work, earns more than husband, education, and managerial occupation as "resources." We grouped joint decision-making on the husband's earnings and household purchases and main decision-making on own earnings and own healthcare as "agency." The study distinguishes differences between decisions based on own earnings and healthcare from husband's earnings and household purchases. In the former, dummy variables identified main decision-making, rather than participation, to create proxies for women having complete liberty to choose economic resources. Such as, she has full access to use her earnings and has full ability to determine whether she needs healthcare and

apply economic resources to healthcare seeking. Given husband's earnings and household purchases intuitively involve spousal discussion, these items were coded based on participation rather than main decision-making.

WEE index

The WEE index (0-8) counted the number of WEE items listed above that a woman reported having at the time of the survey. Descriptions and prevalence of items are provided in Table 3.1

Covariates

Models adjusted for age (categorical at 5-year intervals), age at marriage (categorical at 5-year intervals), parity (categorical with 0=no children, 1=one to two children, 2=two to five children, and 3=more than five children), wealth (categorical), and rurality (binary rural versus urban). The wealth index was a DHS-developed measure comparing wealth strata within a country coded as poorest, poorer, middle, richer, and richest. The household-level wealth index was calculated using data on household assets, household construction materials, and water and sanitation factors.[30]

Table 3.1 WEE proxy prevalence by country, weighted

	Economic resources				Economic Agency			
	Worked past year[1]	Earned same or more than husband[2]	Above primary education[3]	Manager role[4]	DM husband earnings[5]	DM household purchases[6]	DM healthcare[7]	DM own earnings[8]
Afghanistan	13.2	1.5	8.6	6.6	32.0	42.3	3.6	4.9
Albania	41.1	17.6	57.0	10.0	84.0	87.6	2.6	15.3
Angola	65.1	9.8	43.1	4.9	58.9	80.9	17.9	21.6
Armenia	40.5	7.7	93.4	17.0	79.8	80.3	7.4	28.0
Benin	77.9	10.2	25.1	3.3	26.0	47.2	50.9	11.5
Burundi	85.2	15.1	24.5	2.2	63.8	69.3	13.2	12.3
Cambodia	78.8	36.4	40.1	4.5	96.0	93.5	52.4	46.4
Cameroon	67.5	8.2	50.6	0.2	42.0	57.9	27.7	10.1
Chad	51.0	3.1	14.9	0.8	17.1	40.0	26.4	8.9
Colombia	66.5	20.7	82.2	10.6	68.0	59.0	43.3	67.2
DR	57.8	14.0	67.4	12.3	76.7	85.7	21.8	42.3
DRC	72.3	15.4	47.7	2.8	56.3	60.0	17.6	10.8
Egypt	16.1	4.2	65.5	7.3	74.6	67.4	3.8	14.6
Ethiopia	50.1	7.7	17.2	2.4	75.8	78.2	6.2	15.4
Gambia	59.9	5.3	49.7	4.8	20.8	40.0	39.5	17.3
Ghana	76.6	11.0	63.1	5.6	44.2	74.0	39.9	27.3
Guatemala	49.6	9.0	39.6	6.3	78.9	82.0	16.1	19.8
Guinea	71.1	7.9	19.6	2.0	28.4	48.2	37.0	12.0
Haiti	56.3	14.3	53.4	5.2	63.8	82.5	21.4	29.2
India	30.3	8.6	60.1	2.9	69.7	73.4	4.2	12.0
Indonesia	59.2	16.5	71.0	6.5	88.9	76.4	33.4	44.6
Jordan	14.5	6.8	90.8	9.2	78.0	82.3	1.8	24.9
Kenya	66.4	12.0	42.7	9.5	57.0	72.7	24.9	38.8
Liberia	64.3	9.9	45.6	3.2	72.8	79.7	11.0	20.0
Madagascar	80.3	31.2	41.6	3.1	88.1	87.6	20.6	32.2
Malawi	67.1	7.7	25.8	5.0	54.7	55.4	9.9	18.6
Maldives	47.9	11.9	73.6	21.9	82.8	86.8	12.4	23.4
Mali	58.2	3.9	21.3	2.2	12.8	20.3	37.6	7.7
Mauritania	22.3	1.9	28.7	0.3	52.1	62.0	8.1	16.4
Mozambique	46.4	4.3	20.9	2.1	66.0	76.0	9.1	16.5
Myanmar	72.7	23.5	46.4	5.6	87.2	74.3	30.3	40.1
Namibia	45.5	5.2	76.0	8.8	68.5	83.0	9.3	46.8
Nepal	66.9	8.9	50.0	3.8	57.6	53.0	21.4	23.3
Nigeria	68.4	7.9	50.6	6.2	26.7	40.4	41.9	11.2
Pakistan	18.3	2.5	36.0	2.8	46.8	44.5	7.2	10.1
PNG	53.9	17.3	86.3	14.8	89.8	89.1	15.8	47.0
Philippines	32.7	4.5	26.8	4.2	47.8	71.5	6.3	29.8
Rwanda	85.5	22.9	23.4	2.5	74.9	73.6	13.7	23.4
Senegal	53.8	4.2	31.6	1.3	18.3	18.4	31.2	5.5
Sierra Leone	71.6	8.8	41.1	2.4	37.1	47.0	16.7	9.9
South Africa	36.3	6.6	88.4	6.5	80.6	91.6	6.4	41.1
Tanzania	77.1	16.4	23.5	3.2	58.9	45.9	20.3	15.7
Tajikistan	25.5	3.6	94.2	7.7	37.9	37.5	4.9	12.2
Timor-Leste	36.9	8.7	63.1	4.0	78.8	93.7	7.2	31.1
Togo	73.0	8.4	34.7	0.7	16.5	47.2	56.4	11.6
Uganda	77.2	14.1	32.9	7.6	48.8	63.7	33.0	30.4
Yemen	9.8	1.1	48.4	1.1	42.6	49.1	2.2	9.3
Zambia	52.2	9.4	48.0	4.0	65.1	67.5	11.1	40.6
Zimbabwe	51.1	10.9	72.9	5.8	80.7	86.8	12.7	34.2
Total	56.8	10.9	53.4	6.4	60.3	67.2	31.6	19.7
Obvs	890,787	662,607	1,493,194	889,952	594,727	615,316	615,368	662,614

1. Women who worked in past year vs women who did not work in past year
2. Women who earned the same or more than husband vs. women who earned less than husband or have no earnings
3. Women who had above primary education vs. women who did not have above primary education
4. Women who worked in a professional/technical/managerial position vs. women who did not work in this type of position or did not work
5. Women who participated in decision on how to spend husband's earnings vs. women who did not participate
6. Women who participated in decision on household purchases vs. women who did not participate
7. Women who decided alone about whether to seek healthcare for herself vs. women who did not decide alone
8. Women who decided alone about how to spend her earnings vs. women who did not decide alone or had no earnings

Measures for criterion validity analysis of the vanguard WEE index

The Social Institutions and Gender national-level index (SIGI) on restricted access to productive and financial resources was used as a proxy for settings with low women's financial participation. The measure was scaled from 0 (no discrimination) to 10 (absolute discrimination) and uses data on equal rights between men and women at the national level on access to assets, bank accounts, credit, workplace opportunities, maternity leave, and freedom to choose a profession or register a business.[34] Index estimates from 2014 were used for countries with DHS surveys from 2013-2016 and index estimates from 2019 were used for countries with DHS surveys from 2017-2021.

Two individual-level non-economic empowerment proxies were used to test the criterion validity of the vanguard WEE index: access to information and agency on visiting family. The binary measure used to capture access to information was listening to the radio at least once a week vs. does not listen or listens less than once a week. Agency on visiting family was captured by being the main decision-maker on whether to visit family vs. being a joint decision-maker or not a decision-maker.

Statistical analysis

Vanguard WEE measure construction

Being vanguard on an item was defined as having an item in a community where it is not normative for women to have that item. The prevalence of the eight WEE variables overall and by country was explored to measure this concept. Community-level prevalence distributions for each item were explored separately. Given the high variability in WEE

measures across a large dataset of 49 countries, prevalence thresholds were assigned as cutoffs. Two dyads of thresholds were explored: (25%, 75%) and (35% and 65%), in which all communities where the item prevalence was below the smaller percent were labeled non-normative communities and all communities where the item prevalence was above the larger prevalence were considered normative communities. For each dyad of thresholds, the percent of communities that fell as non-normative, normative, and middle-range prevalence communities were presented. To our knowledge, no study has applied thresholds, likely due to few studies exploring multiple indicators across multiple country surveys in which a relativity approach would not make sense systematically.

Next, two approaches labeled middle-range prevalence communities (i.e., communities with prevalence falling between the threshold dyads) as normative or non-normative. The first approach labeled a community as non-normative if the community's prevalence was in the bottom two-thirds of the community-level distribution within the region, as was similarly used by Weber et al. (2019) in a study on gender norms in the Lancet Gender Equality, Norms and Health series.[25] The second approach labeled a community as non-normative if the community's prevalence was less than the regional prevalence, as was done similarly by Metheny et al. (2020) using national prevalence.[26]

Being vanguard on an item was a binary measure of having the item and living in a non-normative community compared to either having the item and living in a normative community or not having the item. For each WEE item separately, the percentage of women who were vanguard on the item among the sample who had the item was explored. For

each WEE item, the difference in percent vanguard among those who had the item was assessed: 1) between measures that used different threshold dyads but the same approach for mid-prevalence communities and 2) between measures that used different approaches for mid-prevalence communities but the same threshold dyad. The number of items a woman was vanguard on was summed up to create the indices. The indices were count variables ranging from 0 (no vanguard items) to 8 (has all items and all items are vanguard). Four indices were generated using combinations of two threshold dyads and two approaches for handling mid-prevalence communities.

Vanguard WEE measure validation

The distributions of the four indices were plotted together on a line graph. The significance of the weighted correlation between each index and a set of demographics (age, age of marriage, parity, wealth, and rurality) was assessed. The intraclass correlation coefficient (ICC) was explored for the four indices and eight WEE items. The ICC provides information on how clustered a measure is, as in, it compares how much units within a group resemble each other and how much units across groups resemble each other.[14] A very low ICC would mean that all communities have about the same proportion of WEE. A high ICC would mean that items are very clustered and community proportions are variable. For something to be under normative influence, an ICC at or above 0.05 would suggest clustering and variability across groups.[14] For vanguard indices, an ICC at or below 0.25 would indicate sufficient within-community variability for analysis.

Based on a lower ICC, higher variability, and smaller differences in percent vanguard from other strategies, we chose one index to move forward with. To test the criterion validity of the selected vanguard WEE index, the index was associated with proxies for access to information, agency over mobility, and national-level financial gender discrimination. Associations were measured by mixed effects linear regression adjusting for survey weighting, number of WEE items, age, wealth, rurality, country fixed effects, and random effects for strata and community. It was hypothesized that more discriminatory settings would be more likely to have higher vanguard WEE status, adjusting for WEE status, given these places are less normative in women's economic participation. It was hypothesized that empowered women, as measured by access to information and agency over mobility, would be more likely to be more vanguard, adjusting for WEE status.

Characteristics of vanguard WEE women

The chosen index was associated with age, age of marriage, parity, wealth, and rurality using mixed effects linear regression, adjusting for survey weighting, strata and community random effects, and the respondent's number of WEE items. For a select set of WEE items that were measured among both married and unmarried women, the design-based F-statistic adjusting for weighting and survey sampling was used to compare the proportion of women vanguard by marital status.

c. Results

Using a threshold dyad of 25%, 75%, the percentage of communities that fell in the middle-range prevalence group ranged from 3.7% (manager occupation) to 53.4% (primary education) (Table 3.2). For the threshold dyad of 35%, 65%, the percent of communities that fell in the middle-range prevalence group ranged from 1% (manager occupation) to 32.6% (primary education) (Table 3.2). Setting a prevalence threshold of 25% as compared to 35% for non-normative communities provided a larger percentage of women who have the item being vanguard for highly prevalent items, and in general, a smaller percentage of women who have the item being vanguard for less prevalent items (Table 3.3, columns A-B, C-D). Comparing approaches among the same threshold, labeling the bottom two-thirds of the community distribution as vanguard as compared to labeling communities that were less than their regional prevalence as vanguard led to a higher proportion of item-positive women labeled as vanguard and more so for higher prevalence items; the difference was less so for a threshold of 35% (Table 3.3, columns B-D, A-C). For low-prevalence items, threshold matters more than approach. When using a low threshold, the approach for mid-prevalence settings was influential. Indices A, B, C, and D had a mean (standard deviation) of 1.26 (1.25); 1.10 (1.19); 0.98 (1.12); and 0.93 (1.11), respectively (Figure 3.1). Distributions of the four count indices were similar, though A (threshold 25%, approach of bottom two-thirds of community distribution) differed more from the other three measures (Figure 3.1). Measures A and B had higher variability.

Table 3.2 Threshold assignment of communities, by WEE item

	Non-normative communities %	Middle range communities %	Normative communities %	Observations[+] (communities)
Threshold Dyad #1				
	Prevalence <25%	25% <= Prevalence <=75%	Prevalence >75%	
Economic resources				
Worked past year	25.1	53.7	21.3	39,313
Earns more than or same as husband	87.4	12.5	0.1	33,826
Above primary education	18.9	53.4	27.7	59,747
Manager occupation	96.3	3.7	0.0	39,298
Economic agency				
Joint DM husband's earnings	13.1	47.0	39.9	30,941
Joint DM household purchases	7.0	49.3	43.7	33,233
Main DM healthcare	61.0	35.8	3.2	33,232
Main DM own earnings	73.1	25.6	1.3	33,826
Threshold Dyad #2				
	Prevalence <35%	35% <= Prevalence <=65%	Prevalence >65%	
Economic resources				
Worked past year	34.1	32.6	33.3	39,313
Earns more than or same as husband	95.0	4.6	0.3	33,826
Above primary education	27.5	32.6	39.9	59,747
Manager occupation	99.0	1.0	0.0	39,298
Economic agency				
Joint DM husband's earnings	19.6	27.0	53.4	30,941
Joint DM household purchases	12.2	29.0	58.8	33,233
Main DM healthcare	73.5	19.5	7.0	33,232
Main DM own earnings	83.2	13.9	3.0	33,826
[+]Limited to communities with at least 9 women with no missing values for the item				

Table 3.3 Percent vanguard among women who have WEE item and differences between thresholds, between approaches, weighted

Percent vanguard among women who have item					
	Overall %	Approach 1 (bottom two-thirds regional community-level distribution)		Approach 2 (community < region)	
		Threshold 25%	Threshold 35%	Threshold 25%	Threshold 35%
		A row%	**B** row%	**C** row%	**D** row%
Economic Resources					
Worked past year (n=878,085)	**56.8**	45.6	34.8	32.9	27.7
Earns more/same as husband (n=618,573)	**10.9**	68.5	84.0	64.7	82.5
Above primary education (n=1,493,194)	**53.4**	33.2	27.2	25.7	22.6
Manager occupation (n=877,181)	**6.4**	71.3	86.9	70.5	86.9
Economic Agency					
Joint DM husband's earnings (n=533,863)	**60.3**	39.1	28.1	29.1	22.9
Joint DM household purchases (n=565,892)	**67.2**	39.1	28.6	29.3	23.0
Main DM own healthcare (n=565,933)	**31.6**	56.4	51.4	41.1	46.0
Main DM own earnings (n=618,580)	**19.7**	59.0	66.5	46.8	58.0

Differences in percent vanguard					
	Overall %	Between thresholds, same approach		Between approaches, same threshold	
		A-B	**C-D**	**B-D**	**A-C**
Joint DM household purchases	67.2	10.6	6.3	5.5	9.8
Joint DM husband's earnings	60.3	11.0	6.2	5.2	9.9
Worked past year	56.8	10.9	5.2	7.0	12.8
Above primary education	53.4	6.0	3.1	4.6	7.5
Main DM own healthcare	31.6	5.0	-4.9	5.4	15.4
Main DM own earnings	19.7	-7.5	-11.2	8.5	12.2
Earns more/same as husband	10.9	-15.5	-17.8	1.5	3.8
Manager occupation	6.4	-15.6	-16.4	0.0	0.8

A: Vanguard item if has the item and lives in a community where the item prevalence is <25% or lives in a community with prevalence =>25% and <=75% and community's prevalence is in the bottom two-thirds of the community-level distribution within the region

B: Vanguard item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two-thirds of the community-level distribution within the region

C: Vanguard item if has the item and lives in a community where the item prevalence is <25% or lives in a community with prevalence =>25% and <=75% and community's prevalence is less than the regional prevalence

D: Vanguard item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is less than the regional prevalence

Figure 3.1 Distributions of proposed indices (n= 440,836)*

# of vanguard items

*among women who do not have missing values for all 8 WEE items

A (mean=1.26; SD=1.25)　　B (mean=1.10; SD=1.19)
C (mean=0.98; SD=1.12)　　D (mean=0.93; SD=1.11)
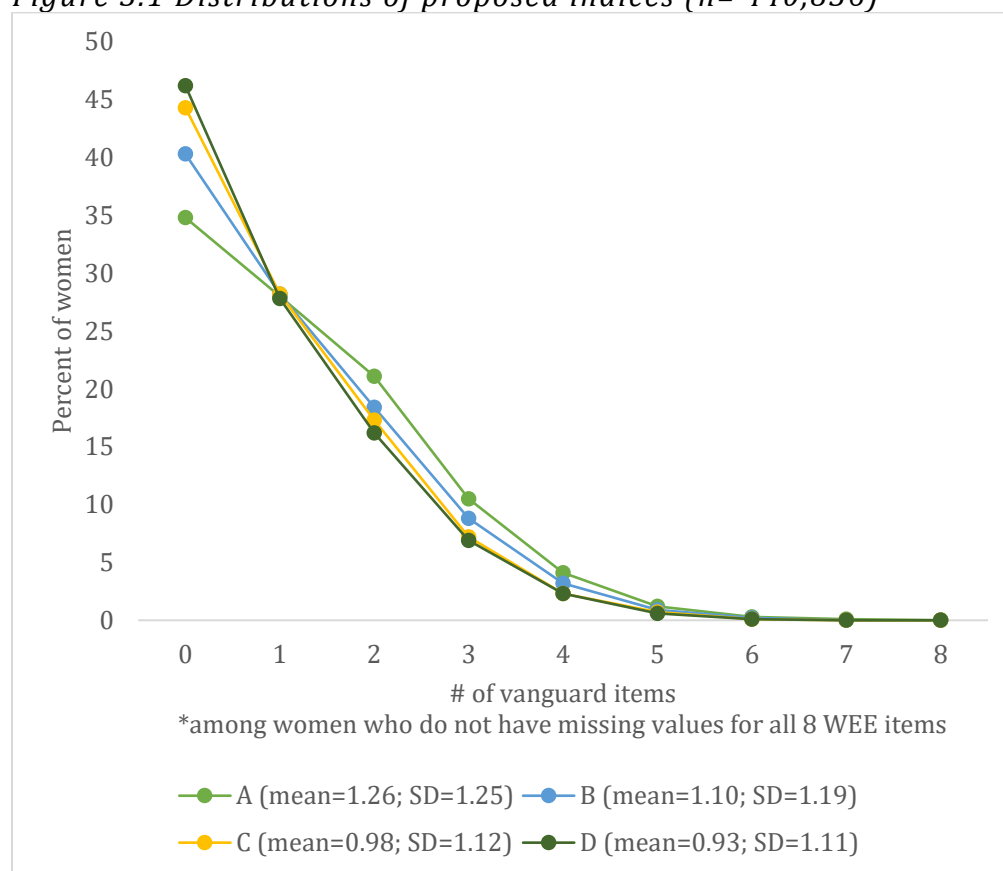
Table 3.4 Bivariate correlations of proposed indices with demographic groups, weighted (n=440,836)*

Approach:	Bottom two-thirds regional community-level distribution				Community < region			
Threshold:	25%		35%		25%		35%	
	Index A		**Index B**		**Index C**		**Index D**	
	Mean	Corr.[+]	Mean	Corr.[+]	Mean	Corr.[+]	Mean	Corr.[+]
Age group		0.10***		0.10***		0.09***		0.09***
<=18 years	0.84		0.73		0.64		0.61	
19-25 years	1.10		0.94		0.84		0.80	
26-35 years	1.29		1.12		1.00		0.95	
36-45 years	1.38		1.21		1.08		1.04	
> 45 years	1.37		1.22		1.07		1.04	
Age of first marriage		0.10***		0.08***		0.09***		0.08***
11-15 years	1.10		1.00		0.85		0.83	
16-20 years	1.22		1.05		0.94		0.89	
21-25 years	1.38		1.19		1.08		1.02	
> 26 years	1.51		1.32		1.18		1.14	
Parity		-0.01***		0.01***		-0.00***		0.01***
No children	1.19		1.04		0.92		0.88	
1-2 children	1.28		1.10		0.99		0.94	
2-5 children	1.28		1.12		0.99		0.95	
>5 children	1.20		1.09		0.93		0.92	
Wealth		0.10***		0.10***		0.08***		0.09***
Poorest	1.07		0.93		0.85		0.80	
Poorer	1.17		1.01		0.91		0.86	
Middle	1.24		1.08		0.96		0.91	
Richer	1.32		1.15		1.01		0.97	
Richest	1.45		1.28		1.12		1.09	
Rurality		-0.09***		-0.08***		-0.08***		-0.07***
Urban	1.39		1.20		1.08		1.02	
Rural	1.17		1.02		0.90		0.87	

*Women who have no missing values for all 8 WEE items, living in communities with at least 9 women surveyed for each WEE item, with no missing covariate values
[+]Pearson's correlation coefficient adjusting for standardized survey weights; p-value of correlation *<0.05 ** <0.01 ***<0.001

Table 3.5 Intra-community correlation coefficients

Proposed indices	
Measure A	0.25
Measure B	0.18
Measure C	0.24
Measure D	0.17
WEE Index	0.41
WEE Economic resources	
Worked past year	0.29
Earns more than husband	0.11
Above primary education	0.29
Manager occupation	0.08
WEE Economic Agency	
Joint DM husband's earnings	0.31
Joint DM household purchases	0.25
Main DM own healthcare	0.22
Main DM own earnings	0.22

Age, age of marriage, wealth, and rurality associated similarly with all four count indices (Table 3.4). All WEE items and WEE overall displayed ICCs across communities higher than or equal to 0.05, suggesting enough clustering to assert that the items were under normative influence (Table 3.5). Indices displayed ICCs equal to or less than 0.25, suggesting at least 75% of the variability in vanguard is within communities (Table 3.5). Due to lower ICCs in indices B and D, higher mean and variability in indices A and B, and smaller differences in percent vanguard between approaches at the 35% thresholds (B and D), index B was chosen for further analysis: using a 35%, 65% threshold and bottom two-thirds of the community-level distribution for mid-prevalence communities. In line with our hypotheses, the vanguard WEE index was significantly greater in contexts with more gender financial discrimination (B 0.72, 95% CI (0.63, 0.81)) (Table 3.6). Further, women who were the main decision-maker for whether to visit family were significantly more likely to have, on average, one more vanguard item than women who were not the main

decision-maker about visiting family (B 0.09, 95% CI (0.07, 0.10)). As measured by

listening to the radio, access to information did not significantly associate with the

vanguard WEE index.

Table 3.6 Vanguard WEE association with national-level discrimination and empowerment measures

	Vanguard Index[++] Coefficient (95% CI)
Increased national-level gender financial discrimination~	0.72*** (0.63, 0.81)
Observations	438,948
Listens to radio at least once a week	-0.00 (-0.01, 0.01)
Observations	442,298
Main decision-maker on whether to visit family	0.09*** (0.07, 0.10)
Observations	430,398
Mixed effects linear regression adjusting for survey weighting, number of WEE items, age, wealth, rurality, country fixed effects, and strata and community random effects *p<0.05; **p<0.01 ; ***p<0.001 [++]Number of items vanguard; vanguard on item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two-thirds of the community-level distribution within the region ~Measured by the SIGI Financial Index	

Vanguard WEE overall was associated with increased age (B 0.02, 95% CI (0.01, 0.02)),

decreased age of marriage (B -0.01, 95% CI (-0.01, 0.00)), decreased wealth (B -0.01, 95%

CI (-0.01, -0.01)), and rurality (B 0.24, 95% CI (0.21, 0.27)) (Table 3.7). Vanguard WEE was

not associated with parity. Married women had a significantly higher likelihood of being

vanguard on work than unmarried women (21.2% vs. 17.4%; p<0.001). Similarly, married

women were likelier to be vanguard on manager occupation (5.7% vs. 5.0%; p<0.001).

However, married women were significantly less likely to be vanguard on primary

education (12.2% vs. 17.8%; p<0.001).

Table 3.7 Demographic characteristics associated with vanguard WEE, weighted

	Vanguard WEE Index[++] Coeff (95% CI)
Age	0.02***(0.01, 0.02)
Age of marriage	-0.01***(-0.01, -0.00)
Parity	-0.00 (-0.01, 0.00)
Wealth	-0.01***(-0.01, -0.01)
Rurality	0.24*** (0.21, 0.27)
Observations	440,836
Mixed effects linear regression adjusting for number of WEE items, survey weighting, strata and community random effects, and country fixed effects *p<0.05; **p<0.01; ***p<0.001 [++]Number of items vanguard; vanguard on item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's	

d. <u>Discussion</u>

This study explores strategies to measure WEE norms across diverse populations. Cislaghi

and Heise (2016) identified two ongoing challenges in how the international development

and public health fields study social norms: 1) lack of knowledge of methods for identifying

behaviors under normative influence and 2) lack of accuracy of reference groups in studies

aggregating individual-level metrics.[35] Further, the authors share that most studies on

social norms use qualitative methods such as in-depth interviews and vignette discussions,

leading to a dearth of quantitative social norms studies with strong external validity.[35] This

study explores WEE norms across 49 countries using geographically accurate, sufficiently

sized reference groups. Further, this study provides widescale evidence that commonly

used WEE proxies are under normative community influence based on intra-class

correlation coefficients across communities. As such, the study addresses gaps in the social

norms literature base.

The proposed vanguard WEE index demonstrates a valid way to identify women going against the community norm on economic participation. For low-prevalence items, the choice of prevalence threshold for labeling communities as non-normative can greatly impact the percentage of women defined as going against the norm. However, indices using different thresholds associated similarly with most demographic items. Different approaches to labeling mid-prevalence communities as non-normative led to minimal differences in the percentage of women defined as going against the norm, though greater differences when combined with a lower prevalence threshold.

Findings suggest that older, poorer, rural, married women are more likely to push the needle on women's economic participation in their communities. This may be due to less rigid norms at older ages and out of economic necessity among poorer women. Married women may have more respect within the community that makes it easier to take on non-normative working behavior. The finding also reflects to the contextual *opportunity* to be vanguard. Further research on characteristics of vanguard women would offer critical information for supporting groups of women in their self-driven efforts to drive normative shifts in women's economic participation globally.

The study has limitations. There is no validated measure of WEE, and the individual measures provided through the DHS are proxies for WEE.[10,36] Unavailable WEE proxies that would be useful to our overall measure are measures of personal assets (such as mobile phone, bank accounts, and savings), further descriptors of the type of work women

participate in (such as outside of the home, payment type, gendered labor), and measures

of financial autonomy, such as access to financial information and having financial goals.

Therefore, we are limited in our ability to fully cover the theorized areas of WEE: agency

and resources that lead to desired wellbeing outcomes. Second, we cannot factor in

women's definitions of empowerment and use a blanket measure across diverse

populations. We are limited in our ability to assume women *want* to have the WEE proxies

we use, and these proxies may lack local or cultural relevance. We acknowledge this

limitation while recognizing the value of this measure to conceptualize WEE across a

diverse population.

Two main limitations relate to vanguard WEE measurement. First, our measure of

vanguard is limited to a descriptive norm referent without a measure of injunctive norms.

Measures of the perceived appropriateness of a woman working, participating in certain

decisions, etc., by community members would greatly improve our measure of "going

against the norm." We recommend future qualitative and quantitative work explore

injunctive norms on WEE. The current approach to capturing vanguard remains useful

because descriptive norms data (prevalence data) is commonly available, and it can be

easily applied to other datasets and contexts. Second, there is no gold standard for "going

against the norm," and few variables exist to compare the vanguard WEE index for

assessing criterion validity. Several psychological constructs of agency, such as measures of

self-efficacy and locus of control, are not available in the DHS.[10] Ideally, we would have

psychological measures of personal agency to validate the vanguard WEE index, as we

suspect women going against the norm are unique in their level of personal agency. Despite

these drawbacks, current evidence of index validity using available comparative measures is promising and represents an advance.

Future research should further explore the proposed approaches to classifying communities as non-normative and seek to validate these approaches through comparisons with measures of injunctive norms. We recommend WEE programming implement a similar count index to understand the level at which individual program participants are transgressing the norm; such efforts will help identify vanguard women who may need additional safety support from backlash and who are uniquely positioned to create change within their communities.

e. <u>Conclusion</u>

To our knowledge, this is the first study to develop and validate a measure of the extent to which a woman is on the vanguard of economic participation in her community. This seminal work on quantitatively labeling settings as non-normative informs future studies focused on social norms measurement. Few studies have used a pooled cross-country sample, and the widescale reach of this study's sample renders it generalizable and externally valid. The findings contribute valuable data on the patterns and trends of going against the norm in economic participation across a set of commonly used proxies for WEE.

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4. Chapter Four: Does going against the norm on women's economic participation increase risk for intimate partner violence? Findings from 44 low- and middle-income countries

a. <u>Abstract</u>

Background: Intimate partner violence (IPV) is a persistent global health challenge affecting one in three women. Women's economic empowerment (WEE) is postulated to reduce the risk of IPV; however, the relationship between WEE and IPV across contexts has proven highly variable. While it is widely recognized that violence risk is impacted by gender equity factors operating across layers of the socio-ecological model, a gap exists in understanding the influence of community norms on the individual-level relationship between WEE and IPV.

Objective: This study tests the hypothesis that IPV risk is higher among women going against the community norm in economic participation. Further, the study explores the moderating effects of wealth on the relationship of interest.

Study sample: The analytic sample was partnered women with no missing values for WEE proxies or covariates, living in communities with at least nine women surveyed for each WEE proxy, and completed the domestic violence module across 44 low- and middle-income countries (n=189,414).

Methods: A vanguard WEE index developed in Chapter 3 capturing the extent to which a woman is going against the community norm was associated with past-year physical IPV, past-year sexual IPV, and current partner control using a three-level mixed effects multilevel logistic model, adjusting for the number of WEE items and covariates.

Interactions between the vanguard WEE index and household wealth were explored. Country-stratified estimates were generated.

Results: As compared to women with no vanguard WEE items, women with one vanguard WEE item had increased physical IPV probability (marginal effect 0.01; 95% CI: 0.01, 0.02), sexual IPV probability (marginal effect 0.01; 95% CI: 0.01, 0.01), and partner control probability (marginal effect 0.02; 95% CI: 0.01, 0.03). The disparity in physical IPV by vanguard WEE status was significantly greater among poorer women (p=0.027). Estimates of the association of vanguard WEE and IPV varied across countries, with most countries showing positive associations.

Discussion: The study found an increased likelihood of partner backlash among women whose behavior contradicted the prevailing community norms on economic participation. Programs aimed at economically empowering women through cash, work, etc., to push the gender equality agenda forward may increase the risk of IPV due to male backlash. The results highlight the importance of understanding the socio-normative context for WEE programming.

b. <u>Background</u>

Intimate partner violence (IPV) is a persistent global health challenge.[1-3] In a 2022 systematic review, it was estimated that approximately 27% and 13% of ever-partnered women worldwide have experienced physical and sexual IPV, respectively.[4] In addition to injury and death, IPV is associated with poor physical and mental health outcomes, including depression, suicide, and HIV/AIDS.[5,6] IPV is widely understood to be a probabilistic event resulting from interacting factors across the socio-ecological model.[7] A

feminist perspective views violence against women as an expression of patriarchal dominance resulting from widespread gender inequality.[8]

Women's access to economic opportunity affects IPV risk.[9] There exists three broad explanations for how increased women's economic participation can decrease IPV. The first is related to household stress, in which increased income for the household can reduce conflict within a couple due to improved financial stability.[10,11] The second draws on Marital Dependency Theory and Social Exchange Theory, in which more financially independent women are more likely to leave a harmful relationship.[12,13] The third related to capability impact, in which economically empowered women are more likely to have strong social networks and improved self-efficacy and bargaining power, which helps them navigate relationships, help-seeking systems, and exit strategies.[14] Given these strong channels for improving women's safety and gender equality more broadly, women's economic empowerment (WEE) efforts have increased substantially in recent years.[15-19] WEE is broadly defined as the process by which women gain access to and control over financial assets and income-generating opportunities to achieve economic participation and agency similar to that of men.[20,21]

While theory suggests that WEE reduces IPV, empirical evidence suggests a more complex relationship.[22,23] A recent review of randomized controlled trials evaluating WEE interventions on IPV found cases of significantly increased IPV, particularly around partner controlling behavior.[17] In a review of thirteen studies correlating microfinance program membership with IPV, five found negative correlations, three found no correlation, and five

found positive correlations.[24] A review of asset ownership found negative associations with IPV in 3 countries and positive associations in 5 countries.[25] Positive associations between WEE and IPV are likely cases of male backlash, in which men use violence to reestablish masculinity within the home after their status is threatened due to the partner taking on more financial control and power.[26-28] To illustrate more clearly, a qualitative study by Murshid et al. (2017) captures male backlash against women's participation in a microfinance program: "*With microfinance, I bring in additional income, and he likes that. But now he also hates me. I feel he thinks I think too much of myself now that I'm a businesswoman. And he hits me because of it*" and "*I think the violence increased in my case because I was more independent. He liked the additional income but accused me of going out to have fun when I was going to work, and that often would result in physical violence.*"[29]

Gaps in the literature exist on where, when, and to whom male backlash against WEE occurs.[17] Individual-level IPV risk factors across demographics and sub-populations have extensively been examined, but none fully explain the heterogeneity found in effect estimates of WEE on IPV across populations. Important work by Schuler and colleagues in Bangladesh suggests that male backlash can be due to a women's behavior being transgressive, or at a different point between transgressive and normal, across settings and groups of women.[30] Therefore, where gender norms are changing fast, we expect changes in the relationship between WEE and IPV to co-occur.[30] While the role of local norms on violence and masculinity in IPV perpetration has been extensively covered, less work has been done on measuring the WEE norm as a critical factor in the WEE-IPV relationship.[31] One study by Metheny et al. (2020) using 32 countries' data found that a positive deviation

from the norm on fertility preference was positively associated with sexual IPV risk.[32]

Heise and Kotsadam (2015) looked at the distribution of survey-level prevalence of women

working across DHS surveys and, splitting countries by lowest 20th percentile vs. top 80th

percentile, found the working increased risk of IPV more in countries where less women

work.[33] These important findings suggest increased risk of IPV among women taking on

non-normative economic participation, suggesting the need for more systematic

measurement of this phenomenon across settings using community WEE norms.[34-36]

Against this backdrop, this study seeks to associate the act of transgressing economic

participation norms with IPV among partnered women across 44 low- and middle-income

countries. Further, wealth is linked with both WEE and IPV and backlash may function

differently depending on household wealth.[32] Thus, we explore wealth as a moderator. The

study draws on a recently developed measure of "vanguard WEE," which captures how

many WEE items out of a set of eight commonly used WEE proxies a woman is going

against the norm on within her immediate geographic community, conditional on having

those items (Chapter 3). To this end, the objectives of this study are to test the hypothesis

that the risk of past-year physical and sexual IPV and current partner-controlling behavior

is higher among women who are not complying with the local norm for women and to

assess if wealth moderates this relationship. Findings offer guidance for norms-sensitive

WEE programming globally.

c. <u>Methods</u>

Data and sample

The data is sourced from the Demographic and Health Surveys (DHS)[37] of 44 countries. Inclusion criteria for country surveys are: 1) conducted since 2013 for time relevance, 2) includes the domestic violence module, and 3) includes all eight WEE variables. The latest survey was used if a country had multiple surveys within the past ten years. The DHS sample is representative at the national, urban/rural residence and regional levels.[37] First, DHS stratification divides the sampling frame into strata that are homogenous in the geographic region and urban/ rural. DHS stratification aims to reduce sampling errors. The household survey employs a two-stage cluster sampling procedure. First, primary-sampling units (PSU) are selected within each stratum based on probability proportional to size based on the country's census. Communities, for this study, are defined by the DHS PSUs. Second, a complete household listing is acquired for each community, and a set number of households is selected by equal probability systematic sampling within each cluster. All women aged 15-49 (in a select few country cases, up to 64) within selected households complete the women's questionnaire. The domestic violence module is conducted with only one woman per household. Among the women randomly selected for the domestic violence module, only those who are ever married completed the section of the domestic violence module on partner violence.

The sample for constructing country and regional prevalence for each WEE variable was individual women with at least one WEE item that did not have a missing value, regardless of whether they participated in the domestic violence module (n=1,396,783). The sample

for constructing community prevalence for each WEE variable was restricted to communities with at least nine women surveyed for that WEE item regardless of whether they participated in the domestic violence module; this sample varied for each WEE item. There is no established guideline for the cutoff; nine was used to maintain sufficient sample sizes per country and to be similar to what has been used in studies that report a minimum cutoff.[38] The analytic sample for this analysis was therefore restricted to the sample of partnered women for which no WEE values or covariate values are missing, living in communities with at least nine women surveyed for each WEE item, and completed the domestic violence module (n=189,414).

Weighting and clustering

All descriptive and inferential analyses used the DHS domestic violence weight for individual women.[39] The DHS domestic violence weight requires re-normalizing when pooling countries into one dataset due to the different survey sizes of different countries. Country surveys vary considerably by size; for instance, the India survey sample is 33,785, whereas the South Africa survey sample is only 266. Without weight normalizing, one country could drive effects within the pooled analysis. Weights were normalized so that each country survey is given equal weight by multiplying each original weight by ((the total pooled sample/ number of surveys) / the sample size in the country survey).

The data are hierarchical, with individuals nested into communities, which are nested within strata, which are nested within countries. Given the clustering of our data, all statistical models applied random intercepts for both strata and community.[40] Random

effects adjust for unobserved latent variables that account for the correlation among women within both strata and communities.[41] Since we expect the relationship between vanguard WEE and outcomes to vary across communities, models also have random slopes for vanguard WEE at the community level. Thus, effect estimates are an average of the relationship across all communities. Unstructured covariance was specified not to assume the two random-effects terms are independent. All analyses adjust for country fixed effects, so women are compared to women within their own country.

Measures

IPV measures: The measure of past-year physical IPV was coded as (1) if the participant reported her partner pushed, slapped, punched, kicked, dragged, strangled, burnt, or twisted her arm at any point in the past year and was coded as (0) if this never happened. The measure of past-year sexual IPV was coded as (1) if the participant was forced to have sex or do unwanted sexual acts by her partner ever in the past year and was coded as (0) if this never happened. The measure of current partner control was coded as (1) if the respondent reported that her partner does not [at the time of survey] permit the respondent to meet with female friends, limits the respondent's contact with family, or insists on knowing where the participant is at all times and was coded as (0) if none of these conditions are true.

WEE measure: Eight WEE proxies commonly used in the literature were employed: 1) women who worked in the past year vs. women who did not work in the past year, 2) women who earned the same or more than their husband vs. women who earned less than

their husband or did not earn, 3) women who had above primary education vs. women who did not, 4) women who worked in a professional/technical/managerial position vs. women who did not work in this type of position or did not work, 5) women who decided alone about how to spend her earnings vs. women who did not decide alone or had no earnings, 6) women who participated in the decision on how to spend husband's earnings vs. women who did not participate or husband had no earnings, 7) women who participated in the decision on household purchases vs. women who did not participate, 8) women who decided alone about whether to seek healthcare for herself vs. women who did not decide alone. The WEE index counts the number of WEE items a woman reported having at the time of the survey (0-8).

Vanguard WEE measure: The vanguard WEE index is a count of the number of items the participant had while living in a community where the item prevalence is <35% or living in a community with prevalence =>35% and <=65% and the community's prevalence was in the bottom two-thirds of the community-level distribution within the region. The vanguard method is outlined in more detail in Chapter 3. Since the count index was right-skewed, we reformed the index into a categorical measure of 0, 1, 2, and 3 or more vanguard WEE items.

Vanguard WEE measures for sensitivity analysis: For sensitivity analysis, two alternative measures of vanguard WEE were used: 1) the same 35%/65% threshold for non-normative and normative communities but a different approach for assigning middle-prevalence communities in which a community with a prevalence between 35% and 65% was labeled

non-normative for an item if the community prevalence was less than the regional

prevalence and 2) the same approach for assigning middle-prevalence communities but a

different threshold dyad of 25%/75%. The vanguard strategies are discussed further in

Chapter 3. The indices were reformed into categorical measures of 0, 1, 2, and 3 or more

vanguard items. The vanguard method is outlined in more detail in Chapter 3.

Covariates: Models adjusted for age (categorical at 5-year intervals), age at marriage

(categorical at 5-year intervals), parity (categorical with 0=no children, 1=one to two

children, 2=two to five children, and 3=more than five children), wealth (categorical) and

rurality (binary rural versus urban). The wealth index is a DHS-developed measure of

wealth strata 1=poorest, 2=poorer, 3=middle, 4=richer, and 5=richest. The household-level

wealth index is calculated using data on household assets, household construction

materials, and water and sanitation factors, comparing households within the same

country.[37] Models also account for country economic development through GDP sourced

from the World Bank.[42]

Statistical analysis

The sample breakdown and bivariate associations between outcome measures and

covariates, WEE, and vanguard WEE were explored using the design-based F-statistic

adjusting for weighting and survey sampling. Next, vanguard WEE was regressed on each

outcome separately with a three-level mixed effects multilevel logistic regression model

adjusting for country fixed effects, total WEE items, age, age at marriage, parity, household

wealth index, rurality, normalized survey weights, and random effects for strata and

community, allowing for random slopes for vanguard WEE across communities. Sensitivity

checks with OLS regression and odds ratios were conducted. Further sensitivity analyses

utilized two alternative ways to measure vanguard WEE, running the same model for each

outcome. Interactions between vanguard WEE and household wealth were tested for each

IPV outcome and significant interactions were displayed graphically in a margins plot.

Country-stratified effects were presented graphically.[4] All inferential estimates were

presented as marginal effects. In reporting the marginal effect after logistic regression, we

report the average percentage point increase in the outcome by one unit change in the

independent variable.

d. Results

Most of the sample of partnered women ages 19-35, 49.5% were married between ages 16

and 20, about 92% had children, and 58% lived in rural areas (Table 4.1). Close to 10% of

the women had no WEE items, and 58.5% had three or more of the 8 WEE items. About

40% had no WEE items they are vanguard on, and 13.2% had three or more vanguard

items. Across the full sample, the weighted estimate of past-year physical IPV is 17.2%,

past-year sexual IPV was 6.1%, and current partner control is 40.5%. Physical IPV was

correlated with younger age, younger age at married, more children, less wealth, and rural

living (p<0.001). Physical IPV was negatively correlated with both WEE items (p<0.001)

and was not correlated with vanguard WEE items (p=0.062). Sexual IPV was correlated

with younger age, younger age of marriage, more children, less wealth, and rural living

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[4]Given convergence issues with smaller samples, we did not apply random slopes to by-country specifications

(p<0.001). Sexual IPV was negatively correlated with WEE items (p<0.001) and positively

correlated with vanguard WEE items (p=0.030). Partner control was significantly

correlated with younger age, younger age at marriage, and urban living (p<0.001). Partner

control was marginally bivariately associated with more children (p=0.041) and not with

wealth (p=0.081). Partner control was negatively correlated with WEE items (p<0.001) and

positively correlated with vanguard WEE items (p=0.001) (Table 4.1).

Table 4.1 Sample characteristics and bivariate associations with past-year physical IPV, past-year sexual IPV, and current partner control, weighted

	Sample	Past-year Physical IPV*		Past-year Sexual IPV**		Current Partner Control***	
	Col (%)	Row (%)	p-value+	Row (%)	p-value+	Row (%)	p-value+
Overall	--	17.2	--	6.1	--	40.5	--
Age group			<0.001		<0.001		<0.001
<=18 years	3.3	18.4		7.8		44.8	
19-25 years	23.0	19.4		6.9		44.8	
26-35 years	39.6	18.0		6.4		41.1	
36-45 years	26.9	15.2		5.3		37.2	
> 45 years	7.2	12.8		4.7		33.5	
Age of first marriage/ cohabitation		<0.001		<0.001		<0.001	
11-15 years	18.2	19.6		7.1		43.1	
16-20 years	49.5	18.2		6.6		41.6	
21-25 years	23.0	14.6		4.9		37.7	
> 26 years	9.3	13.8		4.6		35.6	
Parity			<0.001		<0.001		0.041
No children	7.8	13.3		4.4		38.9	
1-2 children	37.0	16.6		5.6		40.7	
2-5 children	38.4	18.1		6.5		41.0	
>5 children	16.8	18.2		7.1		39.4	
Wealth			<0.001		<0.001		0.081
Poorest	17.7	19.6		6.8		39.4	
Poorer	19.0	19.4		7.1		40.8	
Middle	20.2	17.5		6.1		40.0	
Richer	21.3	16.9		6.1		41.6	
Richest	21.8	13.4		4.7		40.3	
Rurality			<0.001		<0.001		<0.001
Urban	41.6	15.9		5.2		42.0	

Rural	58.4	18.2		6.8		39.3	
WEE			<0.001		<0.001		<0.001
0	9.7	20.4		6.9		40.3	
1	11.4	21.8		7.5		45.9	
2	20.4	17.9		6.5		40.1	
=>3	58.5	15.5		5.6		39.6	
Vanguard WEE++			0.062		0.030		0.001
0	40.3	17.5		5.8		39.3	
1	28.1	17.8		6.6		40.6	
2	18.4	16.4		6.0		41.4	
=>3	13.2	16.5		6.4		42.5	
Observations	189,414	189,407		189,375		188,561	

+P-value of design-based F statistic between variable and physical IPV, sexual IPV, and partner control, adjusting for standardized survey weights and sampling design
++Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two thirds of the community-level distribution within the community
*Pushed, slapped, punched, kicked, dragged, strangled, burnt, OR arm twisted in past year
**Forced sex OR forced unwanted sexual acts in past year
***Partner does not permit meeting with female friends OR partner limits contact with family OR partner insists on knowing where participant is

As compared to women with no vanguard items, women with one vanguard WEE item had a 1-percentage point (pp) increase in physical IPV (marginal effect (ME) 0.01; 95% CI (0.01, 0.02)), a 1-pp increase in sexual IPV (ME 0.01; 95% CI (0.00, 0.02)), and a 2-pp increase in partner control (ME 0.02; 95% CI (0.01, 0.03)) (Table 4.2). Women with two vanguard WEE items had a 1-pp increase for physical IPV (ME 0.01; 95% CI (0.01, 0.02)), a 1-pp increase for sexual IPV (ME 0.01; 95% CI (0.01, 0.02)), and a 3-pp increase in partner control (ME 0.03; 95% CI (0.02, 0.04)). Women with three or more vanguard WEE items had a likely 4-pp increase in physical IPV (ME 0.04; 95% CI (0.02, 0.05)), a 3-pp increase in sexual IPV (ME 0.03; 95% CI (0.02, 0.04)), and a 6-pp increase in the probability of partner control (ME 0.06; 95% CI (0.04, 0.08)) (Table 4.2).

Table 4.2 Mixed effects logistic regression of vanguard WEE on physical IPV, sexual IPV, and partner control, marginal effects, weighted

	Past-year physical IPV		Past-year Sexual IPV		Current Partner Control	
	Marginal effect (95% CI)	Marginal Prob.	Marginal effect (95% CI)	Marginal Prob.	Marginal effect (95% CI)	Marginal Prob.
Vanguard WEE items[+]						
0	Ref	0.15	Ref	0.05	Ref	0.38
1	0.01*** (0.01, 0.02)	0.17	0.01*** (0.01, 0.01)	0.06	0.02*** (0.01, 0.03)	0.40
2	0.02*** (0.01, 0.03)	0.17	0.01*** (0.00, 0.02)	0.06	0.03*** (0.02, 0.04)	0.41
=>3	0.04*** (0.03, 0.05)	0.19	0.03*** (0.02, 0.04)	0.08	0.06*** (0.04, 0.08)	0.44
WEE items						
cont.	-0.01*** (-0.01, -0.01)	--	-0.01*** (-0.01, 0.00)	--	-0.01*** (-0.02, -0.01)	--
Obvs	189,407		189,375		188,561	

*p<0.05; **p<0.01; ***p<0.001
Logistic mixed effects models account for survey weighting, country fixed effects, strata and community random intercepts, adjust for total WEE items (shown in table), age, age of marriage, parity, wealth, rurality, country GDP, and random slopes for vanguard across communities
[+]Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two thirds of the community-level distribution within the community

In sensitivity checks, odds ratios had similar results for partner control but suggested that the increase in physical and sexual IPV associated with three or more vanguard WEE items compared to no vanguard items may not be significant, despite significant marginal effects (Annex Table 7.1 and 7.2). There was a significant increase in risk using odds ratios, however, when comparing any vanguard WEE items to no vanguard items for physical and sexual IPV (Annex Table 7.3). The relationship of IPV with the full eight-count vanguard WEE index was overall not linear, with substantially large confidence intervals at higher levels of vanguard (Figure 4.1). Sensitivity analysis using a vanguard WEE measure with a different approach to labeling middle-prevalence communities as non-normative rendered

similar results (Table 4.3). Sensitivity analysis using a vanguard WEE measure with a different threshold rendered similar results for partner control and had significant positive correlations of physical and sexual IPV with three or more vanguard items ((ME 0.01; 95% CI (0.00, 0.02)) and (ME 0.01; 95% CI (0.00, 0.02)), respectively), but not with 1 or 2 vanguard items (Table 4.3).

Figure 4.1 Marginal probability of past-year physical IPV, sexual IPV, and current partner control by vanguard WEE continuous[5]
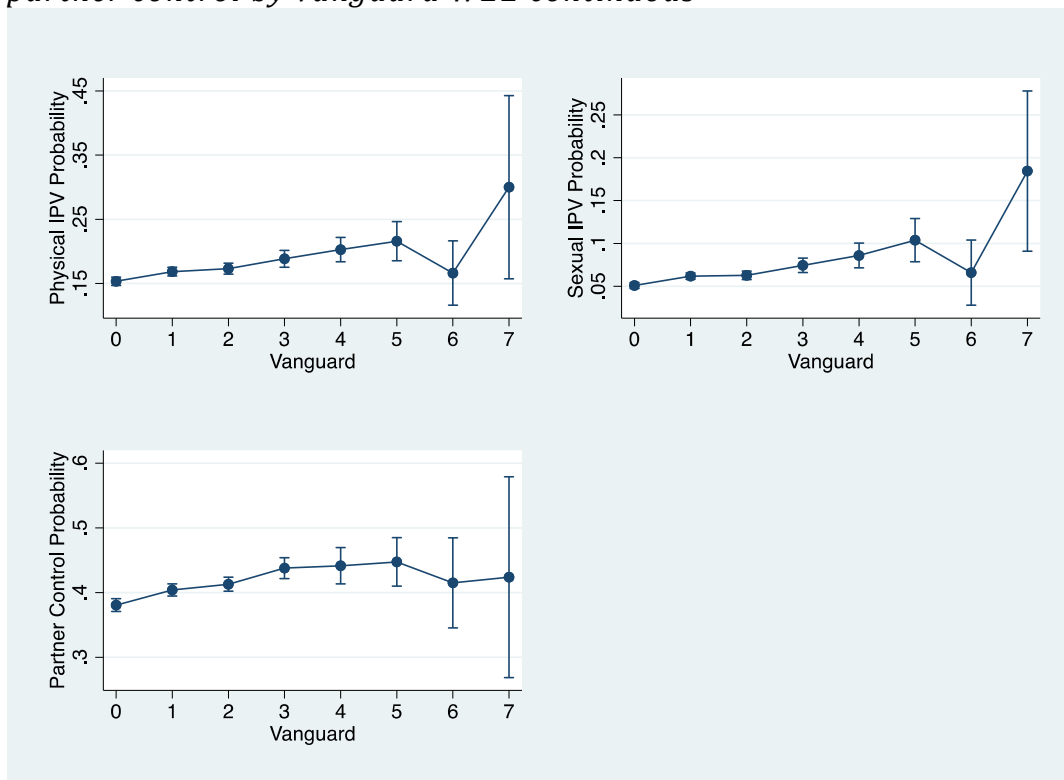
Table 4.3 Sensitivity Analysis: Mixed effects logistic regression of alternate vanguard WEE measures on past-year physical IPV, sexual IPV, and current partner control, marginal effects, weighted

	Past-year Physical IPV	Past-year Sexual IPV	Current Partner Control
	Marginal effect (95% CI)	Marginal effect (95% CI)	Marginal effect (95% CI)
Vanguard WEE, using a different approach for middle-prevalence communities[+]			
0	Ref	Ref	Ref
1	0.01** (0.00, 0.02)	0.01*** (0.01, 0.02)	0.02*** (0.01, 0.03)
2	0.02** (0.01, 0.03)	0.01*** (0.01, 0.02)	0.03*** (0.02, 0.04)
=>3	0.03*** (0.02, 0.05)	0.03*** (0.02, 0.04)	0.05*** (0.03, 0.07)
Observations	189,407	189,375	188,561
Vanguard WEE, using a different threshold dyad[++]			
0	Ref	Ref	Ref
1	0.00 (0.00, 0.01)	0.01* (0.00, 0.01)	0.02** (0.01, 0.03)
2	0.01 (0.00, 0.01)	0.01 (0.00, 0.01)	0.02* (0.00, 0.03)
=>3	0.01* (0.00, 0.02)	0.01** (0.00, 0.02)	0.04*** (0.02, 0.06)
Observations	189,407	189,375	188,561
*p<0.05; **p<0.01; ***p<0.001 Logistic mixed effects models account for survey weighting, country fixed effects, strata and community random effects, adjust for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP, and allow for random slopes for vanguard across communities [+]Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence less than the regional prevalence [++]Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <25% or lives in a community with prevalence =>25% and <=75% and community's prevalence is in the bottom two-thirds of the community-level distribution within the region			

Adjusting for covariates, wealth moderated the relationship between vanguard WEE and

physical IPV (p=0.027). As shown in Figure 4.2, there was a greater disparity in physical

IPV by vanguard among the poorest women. As in, wealth decreased the incidence of

physical IPV due to vanguard status. Wealth did not moderate the relationship between

vanguard and sexual IPV (p=0.390) or partner control (p=0.950).

Figure 4.2 Marginal probabilities of past-year physical IPV at each wealth level, stratified by vanguard WEE[6]
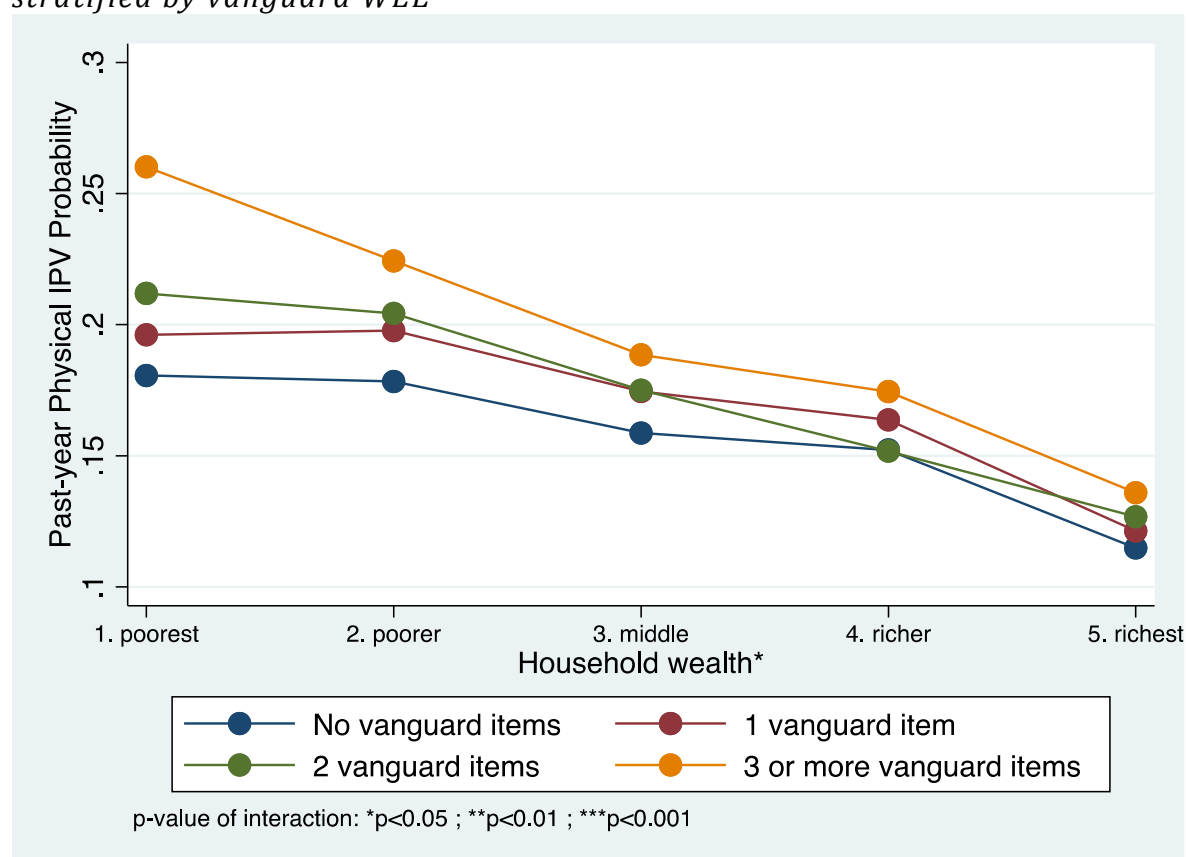
By-country estimates displayed varying effect estimates of a one-item increase in vanguard

WEE on IPV outcomes (Annex Figures 7.1, 7.2, 7.3). Of the 44 countries, 14 (32%) displayed

significant positive associations between physical IPV and vanguard WEE, 18 (41%) non-

significant positive associations, and 11 (25%) non-significant negative associations

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[6]Generated by logistic mixed effects models accounting for survey weighting, country fixed effects, strata and community random effects, adjusting for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP, and allowing for random slopes for vanguard across communities

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(Annex Figure 7.1). One country, Chad, had a significant negative association (ME 0.05; 95% CI (-0.08, -0.02)). Pakistan had the highest positive association of a 5-pp increase in the likelihood of physical IPV (p<0.001). Of the 44 countries, 13 (30%) displayed significant positive associations between sexual IPV and vanguard WEE, 18 (41%) non-significant positive associations, and 12 (27%) non-significant negative associations (Annex Figure 7.2). One country, Kenya, had a significant negative association with sexual IPV (ME 0.06; 95% CI (-0.10, -0.04)). DRC had the highest positive association (ME 0.04; 95% CI (0.02, 0.06)). Of the 44 countries, 17 (39%) displayed significant positive associations between partner control and vanguard WEE, 14 (32%) non-significant positive associations, and 12 (27%) non-significant negative associations (Annex Figure 7.3). One country, Chad, had a significant negative association (ME 0.05; 95% CI (-0.09, -0.01)). Kenya had the highest positive association (ME 0.09; 95% CI (0.01, -0.10)).

e. <u>Discussion</u>

Results indicate that women going against economic participation norms for women in their geographic community are at greater risk for past-year physical and sexual IPV as well as current partner control than those not going against women's economic participation norms, in a broad and diverse set of low- and middle-income countries. Several studies, mostly qualitative studies, have documented spousal backlash against non-normative economic behavior in localized contexts.[22,29,30] Study findings align with the theory of male backlash and represent the first wide scale evidence of this phenomenon. The study demonstrates the importance of considering WEE that is non-normative when exploring relationships between WEE and IPV. Further, studies that have explored

backlash against non-normative WEE typically have focused on very low-income groups, such as those receiving microfinance programming.[17,43] Therefore, a second contribution of this study is the analysis of wealth moderation, in which vanguard behavior was found to be more strongly associated with past-year physical IPV among poorer women. As such, non-normative behavior may be less risky for women in wealthier homes.

Effect sizes were moderate: with just one vanguard item, a woman's probability of physical IPV increased from 0.15 to 0.17. The effects of vanguard WEE on sexual IPV were particularly high given its low prevalence; about 6% of the population reported past-year sexual IPV and an increase in one vanguard item was associated with a 1-pp increase, equivalent to a 20% spike. The strong association between partner control and vanguard WEE is also noteworthy. This is in line with other work; in a recent systematic review of associations between WEE and IPV, the authors noted the studies that found backlash often found it in the form of spousal controlling behavior.[17] Despite vanguard women being more empowered, these results suggest they experience increased spousal control and monitoring, highlighting the importance of measuring psychological abuse and controlling behavior in addition to physical and sexual IPV.

Findings show that the relationship between IPV and vanguard WEE may be more complex at higher levels of vanguard. There was not a linear increase in violence associated with increases in vanguard WEE across all eight items. One sensitivity test suggested the increase in past-year physical and sexual IPV may not be significant for women with three or more vanguard items, compared to no items; this may be due to low power at high levels

of vanguard WEE. Very low sample sizes limited assessment of relationships at high vanguard WEE levels. Future research should explore the trajectory of IPV risk among highly vanguard women.

Heterogeneous effects of vanguard WEE on IPV emerged across countries, suggesting important roles in national-level cultural or legal factors. In very few select cases, there was a flipped effect, in which vanguard WEE was negatively associated with physical IPV in Chad, sexual IPV in the DRC, and partner control in Kenya. While about 70% of countries showed a significant or not significant positive association between vanguard WEE and different forms of IPV, about a third showed non-significant negative associations. Given these by-country results, future research should explore why we see varying relationships across broader settings. For instance, laws and policies on women's economic participation may affect the disparity in IPV by vanguard WEE status.

Based on these findings and given WEE programming typically operates in non-normative WEE contexts, it is critical that WEE programming set up rigorous violence monitoring systems throughout intervention and afterward, even if violence reduction is not a main outcome focus of the program. Such violence monitoring systems must be paired with locally informed safeguarding and help-seeking response channels for participants. Contextualized research on effectively encouraging reporting and response to violent backlash before launching programming should be enforced as standard protocol for WEE efforts. Further, WEE programs should work with male partners of program participants to

better understand and curb unintended violent consequences of changes in women's economic participation.

The study has several limitations. Endogeneity bias due to omitted variables is a persistent issue when working with WEE and violence. There may be something inherently different between women who seek out economic opportunity and women who do not, which may cause differences in violence risk. Ideally, models would adjust for couple dyad and husband characteristics. The study adjusted for covariates associated with violence outcomes that were available across the full dataset. All analyzes were cross-sectional; therefore, we cannot speak to causation, though the past-year IPV referent period, rather than lifetime IPV, helps mitigate temporality issues. Second, all surveys on IPV risk non-response bias, in which some participants do not answer some questions, and social-desirability bias, in which some participants lie to appear more favorable. While we recognize the potential presence of these biases, the DHS has a rigorous methodology for the domestic violence module, which minimizes their effects. Third, the WEE items are proxies limited by cross-national data availability. Future research should explore associations with WEE using a different or appended set of WEE proxies.

The final limitation is there is no gold standard for going against the norm in economic participation to validate our vanguard WEE measure. Our measure uses a strategy to label communities as normative vs. non-normative and tests the associations of interest with strategies of measuring vanguard WEE that use a different threshold and a different approach for middle-prevalence communities. The threshold can make a difference in

results, though this study shows evidence that vanguard WEE and IPV are positively

correlated even when changing the strategy for measuring vanguard WEE across diverse

contexts. The vanguard WEE measure was constructed based on prevalence norms, and

future research should explore the associations of interest using injunctive norms to

identify women going against the norm.

f. Conclusion

Social change causes conflict, and this study contributes evidence that women going against

the norm economically may be more likely to experience IPV. Programs aimed at

economically empowering women to push the gender equality agenda forward may

increase the risk of IPV through partner backlash if not properly accounted for. Future WEE

programming should actively measure WEE norms and ensure safeguards for the women

pushing the needle, particularly among poorer women. This timely study highlights the

nuance of the relationship between women's economic participation and IPV experience

across diverse settings and affirms the critical role of context.

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5. **Chapter Five: Do laws promoting women's economic participation reduce observed IPV risk among women going against the norm in economic participation? Findings from 44 low- and middle-income countries**

a. <u>Abstract</u>

Background: Preventing violence against women and ensuring women have equal rights to economic resources are cornerstones of Goal 5 of the Sustainable Development Goals. Recent work showed an increased likelihood of intimate partner violence (IPV) among women going against the community norm on economic participation, using a newly developed "vanguard WEE" index. Historically, research on the drivers of IPV has focused on individual-level risk factors. Understanding the interaction between socioecological layers, including community norms and macro-level factors such as laws, must accompany the increasing interest in how women's economic participation affects IPV.

Objective: The study assesses whether national economic gender equality legislation, as measured by the World Bank's Women Business and Law Index (WBL), moderates the relationship between IPV and going against the norm on economic participation. The study further explores the moderating roles of the eight sub-indices of the WBL.

Study sample: The analytic sample was partnered women with no missing WEE proxies, living in communities with at least nine women surveyed for each WEE proxy, and completed the domestic violence module across 44 low- and middle-income countries (n=189,414).

Methods: Associations of the WBL and its sub-indices with an indicator for any vanguard WEE items, physical IPV, sexual IPV, and partner control were explored. Using a three-level

multilevel logistic mixed effects model, the interactions of vanguard WEE with the WBL and sub-indices was regressed on physical IPV, sexual IPV, and partner control. Marginal effects of significant interactions were presented graphically.

Results: The WBL was associated with decreased vanguard, physical IPV, and partner control, but was not associated with sexual IPV. The WBL interacted significantly with vanguard WEE on physical IPV (B 0.05, 95% CI 0.02, 0.08), such that increased economic gender equality legislation reduced physical IPV for all women but more so for non-vanguard women than vanguard women. The parenthood and pension sub-indices drove the WBL's interaction with vanguard WEE on physical IPV. The WBL did not interact with vanguard WEE on sexual IPV or partner control.

Discussion: Significant interactions between protective WEE legislation and vanguard WEE on physical IPV suggest greater IPV disparity by vanguard status in more progressive contexts. Women who go against the economic norm benefit less from gender-equitable WEE legislation. More research is needed on how WEE-promoting legislation affects partner violence risk differently across WEE normative contexts for women participating in economic activity.

b. <u>Background</u>

Almost one in three women globally experiences abuse by an intimate partner.[1,2] Achieving gender equality is goal five of the Sustainable Development Goals;[3] as such, many governments and organizations have invested in women's empowerment agendas, and efforts to economically empower women in LMICs have boomed in the past two decades.[4] Economic empowerment is a specific form of empowerment relating to acquiring access to

and agency over economic resources and productivity.[5] Women's economic empowerment (WEE) is postulated to be protective against intimate partner violence (IPV), though a growing body of evidence highlights that the relationship is context-specific.[6-13]

Historically, research on the drivers of IPV has focused on individual risk factors.[14,15] Yet it is widely recognized that violence risk is impacted by gender equity factors operating across layers of the socioecological model.[16] Cislaghi and Heise (2019) argue that understanding the dynamic interaction between socioecological layers of influence must accompany the increasing interest in social norms and how norms affect gender equality outcomes such as IPV.[17] Disparities at the highest level of the social ecology include economic, politico-legal, or physical factors and are seen as structural disparities.[18] While recognized as an important piece of the IPV puzzle, there is a dearth of research on the role of structural interventions in addressing structural disparities. A recent systematic review of structural interventions on IPV highlighted that more research on politico-legal interventions is needed.[18]

Some studies have explored associations of progressive legislation with IPV, with mixed results. Heise and Kotsadman (2015), using multilevel analysis over 44 countries, found that asset ownership rights for women explain some of the prevalence patterns of IPV across countries.[15] Maxwell et al. (2022) found that laws on marital rape, child marriage, and sexual harassment associated negatively with past year IPV.[19] Important work by Garcia-Ramos (2021) found a legal reform to allow easier divorce in Mexico led to a 3.7% increase in IPV rates, presumably due to IPV being used as a tool to prevent women from

filing for divorce.[20] Song et al. (2020) found that in China, women's inheritance rights were related to higher IPV likelihood.[21]

Recent work documented an increased likelihood of IPV among women going against the community norm in economic participation, termed "vanguard WEE" (Chapter 4). However, heterogeneity across countries was observed. The study focused exclusively on the descriptive WEE norm within the community; while it accounted for country economic development, it did not explore whether national-level factors affect the observed relationship.[22] The Women, Business, and the Law Index (WBL) is a World Bank measure of 190 economies[23] comprising eight indicators of gender-based differences in laws associated with women's employment, entrepreneurship, rights within a marriage, and broader economic empowerment. Thus, the WBL is useful for capturing WEE legislation across nations.[24] We expect WEE-supporting laws to decrease women's risk of partner violence through: 1) structurally supporting women's access to cash, which may decrease IPV caused by household stress[25] and decrease women's economic dependency on relationships[26] and 2) promoting gender equity, leading to women's improved bargaining power and status within relationship.[27] Drawing on the Socioecological Systems Theory, the extent that a country's legislation promotes women's economic participation may influence the observed IPV disparity by women's vanguard status.[16,28]

Against this backdrop, this study tests two competing hypotheses for how WEE-promoting legislation may interact with vanguard WEE on IPV (Figure 5.1). On the one hand, WEE legislation may negatively moderate the vanguard WEE – IPV relationship, in which

protective legislation shrinks the effect of vanguard WEE on IPV (hypothesis 1). Evidence

for hypothesis 1 may be due to protective legislation discouraging harmful partner

backlash against non-normative behavior. On the other hand, WEE legislation may

positively moderate the vanguard WEE – IPV relationship, in which protective legislation

increases the effect of vanguard WEE on IPV (hypothesis 2). Evidence for hypothesis 2 may

be due to protective legislation benefiting economically empowered women differently

depending on whether they live in a place where WEE is normative. Communities where it

is more normative for women to participate economically may be more open to the positive

effects of WEE-promoting laws, leading to WEE women living in normative communities

having greater decreases in IPV associated with progressive laws (hypothesis 2). These

hypotheses are assessed by exploring whether the WBL and its associated sub-indices

moderate the vanguard WEE - IPV relationship cross-sectionally across 44 low- and

middle-income countries.

Figure 5.1 Two hypotheses for the impact of WEE legislation on IPV disparity by vanguard WEE
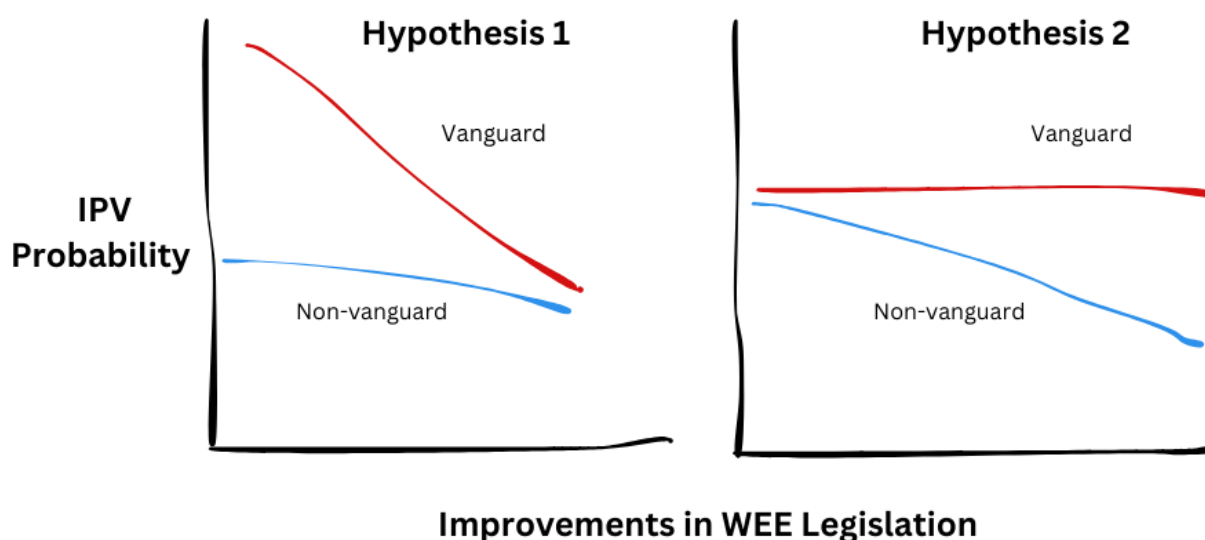
c. Methods

Data and sample

The data is sourced from the Demographic and Health Surveys (DHS)[29] of 44 countries.

Inclusion criteria for country surveys are: 1) conducted since 2013 for time relevance, 2)

includes the domestic violence module, and 3) includes all eight WEE variables. The latest

survey was used if a country had multiple surveys within the past ten years. The DHS

sample is representative at the national, urban/rural residence and regional levels.[29] First,

DHS stratification divides the sampling frame into strata that are homogenous in the

geographic region and urban/ rural. DHS stratification aims to reduce sampling errors. The

household survey employs a two-stage cluster sampling procedure. First, primary-

sampling units (PSU) are selected within each stratum based on probability proportional to

size based on the country's census. Communities, for this study, are defined by the DHS

PSUs. Second, a complete household listing is acquired for each community, and a set

number of households is selected by equal probability systematic sampling within each

cluster. All women aged 15-49 (in a select few country cases, up to 64) within selected

households complete the women's questionnaire. The domestic violence module is

conducted with only one woman per household. Among the women randomly selected for

the domestic violence module, only those who are ever married completed the section of

the domestic violence module on partner violence.

The sample for constructing the country and regional averages for each WEE variable was

individual women with at least one WEE item that does not have a missing value,

regardless of domestic violence module participation (n=1,396,783). The sample for

constructing community averages for each WEE variable was restricted to communities

with at least nine women surveyed for that WEE item regardless of domestic violence

module participation; this sample varies for each WEE item. There is no established

guideline for the cutoff. A cutoff of nine was used to maintain sufficient sample sizes per

country and to be similar to what has been used in studies that report a minimum cutoff.[30]

The analytic sample was restricted to partnered women sampled for the domestic violence

module for which no WEE items or covariates were missing and living in communities with

at least nine women surveyed for each WEE item (n=189,414).

Weighting and clustering

All descriptive and inferential analyses used the DHS domestic violence weight for

individual women. The DHS domestic violence weight requires re-normalizing when

pooling countries into one dataset due to the different survey sizes of different countries.

Country surveys vary considerably by size; for instance, the India survey sample is 33,785,

whereas the South Africa survey sample is only 266. Without weight normalizing, one

country could drive effects within the pooled analysis. Weights were normalized so that

each country survey is given equal weight by multiplying each original weight by ((the total

pooled sample/ number of surveys) / the sample size in the country survey).

The data are hierarchical, with individuals nested into communities, which are nested

within strata, which are nested within countries. Given the clustering of our data, all

statistical models applied random intercepts for both strata and community.[31] Random

effects adjust for unobserved latent variables that account for the correlation among

women within both strata and communities.[32] Since we expect the relationship between vanguard WEE and outcomes to vary across communities, models with vanguard WEE as the independent variable also have random slopes for vanguard WEE at the community level. Thus, effect estimates are an average of the relationship across all communities. Unstructured covariance was specified not to assume the two random-effects terms are independent.

Measures

IPV measures: The measure of past-year physical IPV was coded as (1) if the participant reported her partner pushed, slapped, punched, kicked, dragged, strangled, burnt, or twisted her arm at any point in the past year and was coded as (0) if none of these outcomes happened. The measure of past-year sexual IPV was coded as (1) if the participant was forced to have sex or forced to do unwanted sexual acts by her partner ever in the past year and was coded as (0) if this never happened. The measure of current partner control was coded as (1) if the respondent reported that her partner does not permit the respondent to meet with female friends or limits the respondent's contact with family or insists on knowing where the participant is at all times and was coded as (0) if none of these conditions are true.

WEE measure: Eight WEE proxies commonly used in the literature were used: 1) women who worked in the past year vs. women who did not work in the past year, 2) women who earned the same or more than their husband vs. women who earned less than their husband or did not earn, 3) women who had above primary education vs. women who did

not, 4) women who worked in a professional/technical/managerial position vs. women who did not work in this type of position or did not work, 5) women who decided alone about how to spend her earnings vs. women who did not decide alone or had no earnings, 6) women who participated in the decision on how to spend husband's earnings vs. women who did not participate or husband had no earnings, 7) women who participated in the decision on household purchases vs. women who did not participate, 8) women who decided alone about whether to seek healthcare for herself vs. women who did not decide alone. The WEE index counts the number of WEE items a woman reports having at the time of the survey (0-8).

Vanguard WEE measure: To be vanguard on a WEE item (eight WEE items listed above), the participant had the item and lived in a community where the item prevalence was <35% or lived in a community with prevalence =>35% and <=65% falling in the bottom two-thirds of the community-level distribution within the region. The vanguard method is outlined in Chapter 3. A binary measure of vanguard WEE was constructed for analysis in which 1=one or more vanguard items vs. 0=no vanguard items.

National level WEE laws and policies: The Women, Business and Law Index (WBL) is sourced from the World Bank.[24] The index components were "validated against sources of national law, constitutions, codes, laws, regulations, and procedures for participating countries."[33] The WBL is an average of eight sub-indices for which higher implies more supportive laws for women. The scores are out of 100 and were scaled to 0-10. We use the values at the time of one year before the country's DHS survey was conducted.[23] Sub-

indices capture laws on gender-equitable rights on mobility, workplace, pay, marriage,

parenthood, entrepreneurship, assets, and pensions; details of these sub-indices were

outlined in Table 5. 1.

Table 5.1 WBL subindex descriptions

Mobility	1) Can a woman choose where to live in the same way as a man? 2) Can a woman travel outside her home in the same way as a man? 3) Can a woman apply for a passport in the same way as a man? 4) Can a woman travel outside the country in the same way as a man?
Workplace	1) Can a woman get a job in the same way as a man? 2) Does the law prohibit discrimination in employment based on gender? 3) Is there legislation on sexual harassment in employment? 4) Are there criminal penalties or civil remedies for sexual harassment in employment?
Equal pay	1) Does the law mandate equal remuneration for work of equal value? 2) Can a woman work at night in the same way as a man? 3) Can a woman work in a job deemed dangerous in the same way as a man? 4) Can a woman work in an industrial job in the same way as a man?
Marriage	1) Is there no legal provision that requires a married woman to obey her husband? 2) Can a woman be head of household in the same way as a man? 3) Is there legislation specifically addressing domestic violence? 4) Can a woman obtain a judgment of divorce in the same way as a man? 5) Does a woman have the same rights to remarry as a man?
Parenthood	1) Is paid leave of at least 14 weeks available to mothers? 2) Does the government administer 100% of maternity leave benefits? 3) Is there paid leave available to fathers? 4) Is there paid parental leave? 5) Is dismissal of pregnant workers prohibited?
Entrepreneurship	1) Does the law prohibit discrimination in access to credit based on gender? 2) Can a woman sign a contract in the same way as a man? 3) Can a woman register a business in the same way as a man? 4) Can a woman open a bank account in the same way as a man?
Assets	1) Do men and women have equal ownership rights to immovable property? 2) Do sons and daughters have equal rights to inherit assets from their parents? 3) Do male and female surviving spouses have equal rights to inherit assets?

	4) Does the law grant spouse equal administrative authority over assets during marriage? 5) Does the law provide for the valuation of nonmonetary contributions?
Pension	1) Is the age at which men and women can retire with full pension benefits the same? 2) Is the age at which men and women can retire with partial pension benefits the same? 3) Is the mandatory retirement age for men and women the same? 4) Are periods of absence due to childcare accounted for in pension benefits?
Sourced from World Bank[23]	

Covariates: Models adjusted for age (categorical at 5-year intervals), age at marriage (categorical at 5-year intervals), parity (categorical with 0=no children, 1=one to two children, 2=two to five children, and 3=more than 5 children), wealth (categorical) and rurality (binary rural versus urban). The wealth index is a DHS-developed measure of wealth strata 1=poorest, 2=poorer, 3=middle, 4=richer, and 5=richest, and is household-level calculated using data on household assets, household construction material, and water and sanitation factors comparing households within the same country.[29] Models also adjusted for a woman's number of WEE items (listed under " WEE measure") regardless of vanguard WEE status. All models adjust for GDP, sourced by the World Bank for each country at the year of the DHS survey, to adjust for general country economic development.[34]

Statistical analysis

Sample breakdown and bivariate associations of outcomes with covariates and vanguard WEE were explored using design-based F-statistic adjusting for weighting and survey sampling. The average number of WEE items, percent with at least one vanguard WEE item,

and WBL score were explored by country. The WBL and individual WBL sub-indices were associated with vanguard WEE, physical IPV, sexual IPV, and partner control using a three-level mixed effects logistic model accounting for survey weighting, WEE index, age, age of marriage, parity, wealth, rurality, country GDP, and strata and community random effects. Vanguard WEE was associated with the three outcomes with the same model applying random slopes of vanguard WEE across communities. The interaction of vanguard WEE and the WBL and sub-indices was regressed on physical IPV, sexual IPV, and partner control. The marginal probabilities of significant interactions were outputted and displayed graphically.

d. <u>Results</u>

The majority of women were ages 19-35, 67.7% were married before age 21, 92.2% had children, and 58.4% lived in rural areas (Table 5.2). The weighted estimate of past-year physical IPV was 17.2%, past-year sexual IPV was 6.1%, and current partner control was 40.5%. Physical IPV was correlated with younger age, younger age at married, more children, less wealth, and rural living (p<0.001). Sexual IPV was correlated with younger age, younger age of married, more children, less wealth, and rural living (p<0.001). Partner control was correlated with younger age, younger age of married, urban living (p<0.001), and parity (p=0.046). Partner control was not associated with wealth (p=0.087) (Table 5.2).

Table 5.2 Sample characteristics and bivariate associations with past-year physical IPV, past-year sexual IPV, and current partner control, weighted

	Sample	Past-year Physical IPV*		Past-year Sexual IPV**		Current Partner Control***	
	Col (%)	Row (%)	p-value[+]	Row (%)	p-value[+]	Row (%)	p-value[+]
Overall	--	17.2	--	6.1	--	40.5	--
Age group			<0.001		<0.001		<0.001
<=18 years	3.3	18.4		7.8		44.8	
19-25 years	23.0	19.4		6.9		44.8	
26-35 years	39.6	18.0		6.4		41.1	
36-45 years	26.9	15.2		5.3		37.2	
> 45 years	7.2	12.8		4.7		33.5	
Age of first marriage/cohabitation			<0.001		<0.001		<0.001
11-15 years	18.2	19.6		7.1		43.1	
16-20 years	49.5	18.2		6.6		41.6	
21-25 years	23.0	14.6		4.9		37.7	
> 26 years	9.3	13.8		4.6		35.6	
Parity			<0.001		<0.001		0.046
No children	7.8	13.3		4.4		38.9	
1-2 children	37.0	16.6		5.6		40.7	
2-5 children	38.4	18.1		6.5		41.0	
>5 children	16.8	18.2		7.1		39.4	
Wealth			<0.001		<0.001		0.087
Poorest	17.7	19.6		6.8		39.4	
Poorer	19.0	19.4		7.1		40.8	
Middle	20.2	17.5		6.1		40.0	
Richer	21.3	16.9		6.1		41.6	
Richest	21.8	13.4		4.7		40.3	
Rurality			<0.001		<0.001		<0.001
Urban	41.6	15.9		5.2		42.0	
Rural	58.4	18.2		6.8		39.3	
Observations	189,414	189,407		189,375		188,561	

[+]P-value of design-based F statistic between variable and physical IPV, sexual IPV, and partner control, adjusting for standardized survey weights and sampling design
[++]One or more items for which a woman is vanguard on; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two thirds of the community-level distribution within the community
*Pushed, slapped, punched, kicked, dragged, strangled, burnt, OR arm twisted in past year
**Forced sex OR forced unwanted sexual acts in past year
***Partner does not permit meeting with female friends OR partner limits contact with family OR partner insists on knowing where participant is

Across the 44 countries, the WBL index ranged from 2.9 to 8.8, with the lowest and highest scores in Afghanistan and South Africa, respectively. Percent with any vanguard WEE items ranged from 35.1% to 79%, with the lowest and highest scores in Jordan and Colombia, respectively (Table 5.3). On average, 59.7% had one or more vanguard WEE items.

Table 5.3 Country sample and national-level measures, weighted

	Average WEE[1]	Percent with any vanguard WEE items[2]	WBL[3]
Afghanistan (2015)	1.1	38.3	2.9
Angola (2016)	3.2	69.4	7.3
Armenia (2016)	3.6	48.6	8.1
Benin (2018)	2.6	65.2	7.4
Burundi (2017)	3.0	61.9	7.3
Cambodia (2014)	4.5	65.7	7.5
Cameroon (2018)	2.8	61.3	6.0
Chad (2015)	1.6	49.0	5.8
Colombia (2015)	4.9	79.0	7.9
DR (2013)	3.8	70.6	7.8
DRC (2014)	2.9	65.6	4.3
Egypt (2014)	2.5	52.6	3.9
Ethiopia (2016)	2.3	47.3	7.2
Gambia (2020)	2.4	72.6	6.9
Guatemala (2015)	2.9	56.4	7.1
Haiti (2017)	3.5	78.4	5.9
India (2016)	2.5	53.1	6.6
Jordan (2018)	3.1	35.1	3.2
Kenya (2014)	3.0	72.9	7.6
Liberia (2020)	3.2	67.1	8.1
Madagascar (2021)	4.0	60.7	7.2
Malawi (2016)	2.3	69.5	7.8
Maldives (2017)	3.6	58.3	7.1
Mali (2018)	1.6	45.5	5.4
Mauritania (2021)	1.9	49.4	4.8
Mozambique (2015)	2.3	49.3	7.9
Myanmar (2016)	3.8	61.9	5.9
Namibia (2013)	3.5	64.3	8.6

Nepal (2016)	2.7	69.7	5.6
Nigeria (2018)	2.5	57.6	6.3
Pakistan (2018)	1.7	54.5	5.0
PNG (2017)	2.1	60.7	6.0
Philippines (2018)	4.2	54.6	7.9
Rwanda (2015)	3.3	56.7	7.3
Senegal (2019)	1.6	55.7	6.4
Sierra Leone (2019)	2.5	63.5	6.3
South Africa (2016)	3.7	53.0	8.8
Tajikistan (2017)	2.2	68.6	7.6
Tanzania (2016)	2.8	41.4	8.1
Timor-Leste (2016)	3.2	51.4	8.1
Togo (2014)	2.7	69.8	8.2
Uganda (2016)	3.2	73.6	7.0
Zambia (2014)	3.1	70.5	6.3
Zimbabwe (2015)	3.6	62.6	8.7
1. National weighted average of the eight WEE proxies from the DHS used in this analysis			
2. Weighted percent of women who have any vanguard items by national population			
3. WBL value taken one year before the year of DHS survey			

The WBL and all subindices were associated significantly with less vanguard WEE

likelihood, apart from the sub-index on pension rights (Table 5.4). The WBL (marginal

effect (ME) -0.01; 95% CI (-0.02, 0.01)) and the pay, parenthood, entrepreneurship, and

pension sub-indices were significantly associated with decreased physical IPV. In contrast,

the mobility (ME 0.00; 95% CI (0.00, 0.01)), marriage (ME 0.01; 95% CI (0.00, 0.01)), and

assets (ME 0.01; 95% CI (0.00, 0.01)) subindices were associated with increased physical

IPV. The WBL was not significantly associated with sexual IPV. However, subindices on

mobility, parenthood, and entrepreneurship were negatively associated with sexual IPV

and subindices workplace, marriage, and assets were positively associated with sexual IPV.

The WBL (ME -0.01; 95% CI (-0.02, 0.01)) and subindices on mobility (ME -0.01; 95% CI (-

0.02, 0.01)), workplace (ME -0.01; 95% CI (-0.02, 0.01)), and entrepreneurship (ME -0.01;

95% CI (-0.02, 0.01)) were associated with decreased partner control. In contrast,

subindices on pay and pension were significantly positively associated with partner control

(Table 5.4). Having one or more items that are vanguard, as compared to no items that are

vanguard, correlated with a 1-percentage point (pp) increase in physical IPV (ME 0.01;

95% CI (0.01, 0.02)), a 1-pp increase in sexual IPV (ME 0.01; 95% CI (0.01, 0.01)) and a 2-

pp increase in partner control (ME 0.02; 95% CI: (0.01, 0.03)).

Table 5.4 Mixed effects logistic regression of WBL and sub-indices on vanguard WEE, past-year physical IPV, past-year sexual IPV, and current partner control, marginal effects, weighted

	Vanguard~+ (n= 189,414)	Past-year physical IPV (n= 189,407)	Past-year Sexual IPV (n= 189,375)	Current Partner Control (n= 188,561)
	Marginal effect (95% CI)	Marginal effect (95% CI)	Marginal effect (95% CI)	Marginal effect (95% CI)
WBL	-0.03*** (-0.03, -0.02)	-0.01*** (-0.02, 0.01)	0.00 (0.00, 0.00)	-0.01** (-0.02, -0.00)
WBL subindex - Mobility	-0.01*** (-0.01, 0.00)	0.00* (0.00, 0.01)	-0.00*** (0.00, 0.00)	-0.01*** (-0.01, -0.01)
WBL subindex - Workplace	-0.01*** (-0.01, -0.01)	0.00 (0.00, 0.00)	0.00*** (0.00, 0.00)	-0.01*** (-0.01, -0.01)
WBL subindex - Pay	-0.01*** (-0.01, 0.00)	-0.01*** (-0.01, -0.01)	0.00 (0.00, 0.00)	0.00*** (0.00, 0.01)
WBL subindex - Marriage	-0.00*** (-0.01, 0.00)	0.01*** (0.01, 0.01)	0.00* (0.00, 0.00)	0.00 (-0.01, 0.00)
WBL subindex - Parent	-0.01*** (-0.01, 0.00)	-0.01*** (-0.01, -0.01)	-0.00* (-0.00, -0.00)	0.00 (0.00, 0.00)
WBL subindex - ENTPRE	-0.03*** (-0.03, -0.02)	-0.01*** (-0.01, -0.01)	-0.01*** (-0.01, 0.01)	-0.03*** (-0.04, -0.03)
WBL subindex - Assets	-0.01*** (-0.02, -0.01)	0.01*** (0.01, 0.01)	0.00* (0.00, 0.00)	0.00 (0.00, 0.01)

WBL subindex - Pension	0.00* (0.00, 0.01)	-0.01*** (-0.02, 0.01)	0.00 (0.00, 0.00)	0.01*** (0.01, 0.02)
Vanguard~+	--	0.01*** (0.01, 0.02)	0.01*** (0.01, 0.01)	0.02*** (0.01, 0.03)

*p<0.05; **p<0.01; ***p<0.001
Logistic mixed effects models account for survey weighting, strata and community random effects, and adjust for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP
~+Has at least one vanguard item (vs. no vanguard items); vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two thirds of the community-level distribution within the region, out of eight WEE items; 59.7% of women had at least 1 vanguard item

The WBL significantly interacted with vanguard WEE on past-year physical IPV; the coefficient of decrease in past-year physical IPV associated with a one-unit increase in the WBL was -0.13 (95% CI (-0.18, -0.07)) for non-vanguard WEE women and was 0.05 greater among vanguard WEE women (B 0.05, 95% (CI 0.02, 0.08)) (Table 5.5). The overall WBL interaction was driven by subindices on parenthood (B 0.04, 95% CI (0.01, 0.06)) and pension rights (B 0.04, 95% CI (0.02, 0.06)) (Table 5.5). Rights to assets, associated with increased physical IPV, marginally significantly interacted with vanguard WEE on physical IPV (B 0.03, 95% CI (0.00, 0.05)). While the WBL did not significantly interact with vanguard WEE on past-year sexual IPV, the sub-index on parenthood marginally interacted with vanguard WEE on past-year sexual IPV (B 0.04, 95% CI (0.01, 0.07)). There were no significant interactions between the WBL or sub-indices with vanguard WEE for partner control (Table 5.5).

Table 5.5 Mixed effects logistic regression of the interaction of WBL and associated indices with vanguard WEE on physical IPV, sexual IPV, and partner control, weighted

	Past-year physical IPV (n= 189,407) Coeff. (95% CI)	Past-Year Sexual IPV (n= 189,375) Coeff. (95% CI)	Current Partner Control (n= 188,561) Coeff. (95% CI)
Vanguard[+]	**-0.07 (-0.28, 0.13)**	0.35 (-0.03, 0.74)	0.04 (-0.14, 0.21)
WBL	**-0.13*** (-0.18, -0.07)**	-0.01 (-0.08, 0.06)	-0.07** (-0.11, -0.02)
WBL#Vanguard	**0.05** (0.02, 0.08)**	0.02 (-0.03, 0.07)	0.02 (-0.01, 0.05)
WBL Sub-indices			
Vanguard[+]	0.15 (0.00, 0.30)	0.53*** (0.26, 0.80)	0.17*** (0.05, 0.30)
Mobility	0.02 (0.0, 0.05)	-0.04* (-0.08, -0.01)	-0.07*** (-0.09, -0.05)
Mobility#Vanguard	0.01 (-0.01, 0.03)	-0.01 (-0.03, 0.02)	0.00 (-0.01, 0.02)
Vanguard[+]	0.14* (0.01, 0.27)	0.50*** (0.28, 0.74)	0.11* (0.01, 0.21)
Workplace	0.01 (-0.02, 0.03)	0.05*** (0.02, 0.08)	-0.06*** (-0.07, -0.04)
Work#Vanguard	0.01 (0.00, 0.03)	0.00 (-0.03, 0.02)	0.01 (0.00, 0.02)
Vanguard[+]	0.22*** (0.12, 0.31)	0.53*** (0.35, 0.72)	0.17*** (0.09, 0.25)
Pay	-0.08*** (-0.10, -0.06)	0.02 (0.00, 0.04)	0.03*** (0.01, 0.04)
Pay#Vanguard	0.00 (-0.01, 0.02)	-0.01 (-0.03, 0.01)	0.00 (-0.01, 0.01)
Vanguard[+]	0.17** (0.05, 0.30)	0.56*** (0.34, 0.79)	0.09 (-0.01, 0.19)
Marriage	0.07*** (0.05, 0.10)	0.03 (0.00, 0.06)	-0.02* (-0.04, 0.00)
Marriage#Vanguard	0.01 (-0.01, 0.02)	-0.01 (-0.04, 0.01)	0.01 (0.00, 0.03)
Vanguard[+]	**0.10* (0.01, 0.20)**	**0.36*** (0.19, 0.53)**	0.20*** (0.11, 0.30)
Parent	**-0.14*** (-0.17, -0.12)**	**-0.06*** (-0.09, -0.02)**	0.02 (-0.01, 0.04)
Parent#Vanguard	**0.04*** (0.01, 0.06)**	**0.04* (0.01, 0.07)**	-0.01 (-0.02, 0.01)
Vanguard[+]	0.17 (-0.01, 0.36)	0.31* (0.04, 0.59)	0.04 (-0.15, 0.23)
Entrepreneurship	-0.11*** (-0.14, -0.08)	-0.17*** (-0.21, -0.13)	-0.22*** (-0.25, -0.19)
ENTPRE#Vanguard	0.01 (-0.02, 0.03)	0.02 (-0.01, 0.06)	0.02 (-0.01, 0.04)
Vanguard[+]	**0.03 (-0.14, 0.21)**	0.26 (-0.02, 0.55)	0.09 (-0.04, 0.22)
Assets	**0.07*** (0.04, 0.11)**	0.02 (-0.03, 0.06)	0.00 (-0.02, 0.03)
Assets#Vanguard	**0.03* (0.00, 0.05)**	0.03 (0.00, 0.06)	0.01 (-0.01, 0.03)
Vanguard[+]	**-0.08 (-0.24, 0.08)**	0.27* (0.00, 0.53)	0.08 (-0.07, 0.24)
Pension	**-0.14*** (-0.17, -0.10)**	-0.02 (-0.05, 0.02)	0.06*** (0.03, 0.10)
Pension#Vanguard	**0.04*** (0.02, 0.06)**	0.03 (0.00, 0.06)	0.01 (-0.01, 0.03)

*p<0.05; **p<0.01; ***p<0.001

Logistic mixed effects models account for survey weighting, strata, and community random effects, and adjust for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP

[+]Has at least one vanguard item (vs. no vanguard items); vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two thirds of the community-level distribution within the region, out of eight WEE items

Figure 5.2 displays the margin plots of the five identified significant interactions. As the WBL increased, past-year physical IPV for both vanguard WEE and non-vanguard WEE decreased, yet at a faster rate for non-vanguard WEE women ($p < 0.01$). For both the pension and parenthood sub-indices, there was a similar trend of greater decreases in past-year physical IPV associated with protective laws among non-vanguard WEE women and greater disparity in past-year physical IPV by vanguard WEE in settings with more gender-equitable legislation($p < 0.001$). Improved asset laws were associated with increased past-year physical IPV: associated increases were greater among vanguard WEE women than non-vanguard WEE women ($p < 0.05$). For the one significant interaction on sexual IPV, the sub-index on parenthood laws was negatively associated and the negative association was stronger among non-vanguard WEE women ($p < 0.05$).

Figure 5.2 Marginal probabilities of past-year IPV at levels of the WBL and sub-indices, stratified by vanguard WEE status, for significant interactions, weighted

*p<0.05 ; ** p<0.01 ; ***p<0.001

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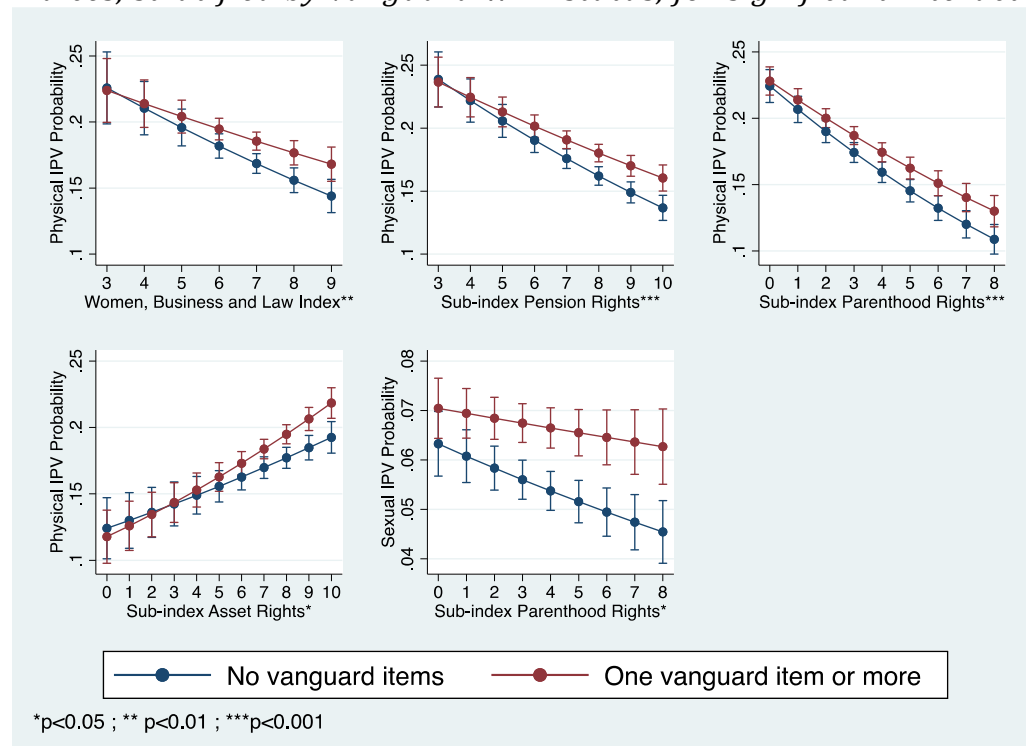
e. <u>Discussion</u>

Using mixed effects multilevel modeling, we found evidence that national WEE legislation positively moderates the individual-level relationship between vanguard WEE and past-year physical IPV, though not past-year sexual IPV or current partner control. Interaction analyzes support hypothesis 2, in which vanguard women going against the community economic norm (vanguard WEE) benefit less from progressive WEE legislation than other women in their community. For instance, in places with improved rights to maternity leave and protection for pregnant workers, there was a greater disparity in physical IPV by vanguard WEE status compared to places with less protective parenthood rights.

Findings imply that national economic gender equality legislation, while associated with decreased physical IPV overall, does not shrink the effects of vanguard WEE but rather has differential impacts on IPV by whether women go against the economic norm. Theory asserts that WEE legislation improves IPV rates through increasing women's access to cash and improving gender equity. Current findings suggest that these benefits may be more widely felt among women in communities that are relatively normative on economic participation, as compared to economically active women in communities where economic participation is relatively abnormal for women. Such results may be due to WEE-normative communities being more gender equitable and more likely to accept and implement WEE legislation on the ground.

While advances in WEE legislation overall were protective, some specific laws were associated with increased IPV risk; for instance, improved laws on women's assets and

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inheritance rights were correlated with increased past-year physical and sexual IPV. Such findings have been found elsewhere; a study across 28 countries found asset ownership was positively associated with IPV in 5 countries, not significantly associated in 20 countries, and negatively associated in only three countries.[13] Increases in IPV associated with improved laws on women's access to assets and inheritance may be due to women's property ownership transgressing gender norms in which legislative encouragement leads to male partners asserting their control through violence. In line with this theory, our study found that gender-equitable asset ownership was associated with *even greater* physical IPV risk among vanguard WEE women. We also found that improved laws on women's pay and pension rights were associated with increased partner control. This finding suggests that when top-down legislation encourages women to work and participate in formal government programs, socially, men may feel their status in society threatened and increase their control and monitoring of their partners.

There were negative associations between improvements in national WEE laws and vanguard WEE, suggesting that federal regulations are related to the normalization process of women's economic participation. Though the results are noteworthy, it is important to highlight that the magnitude of the effects of national laws on IPV outcomes and the interaction of the national laws and vanguard WEE are small. Small magnitudes may be due to laws not being fully implemented or realized within communities. More research should explore the reach of laws and strategies for effectively measuring their implementation and subsequent impacts.

The study has several limitations. First, the WBL and subindices are measures of the law de jure and do not reflect whether the law is practiced or implemented across the population. Further, our measure of vanguard WEE is limited to a descriptive norm referent without the incorporation of injunctive norms. Measures of the perceived appropriateness of a woman working, participating in certain decisions, etc., by a community would significantly improve our measure of "going against the norm." All analysis is correlational and non-causal; reverse causation in which IPV causes vanguard behavior is a possibility, and temporality of the relationship between legislation changes and changes in IPV probability is not ensured in this analysis. Using past-year IPV, rather than lifetime IPV, and using the WBL score aligning with one year before the DHS survey were strategies taken to help mitigate this limitation.

f. <u>Conclusion</u>

The study highlights increased effects of vanguard WEE on past-year physical IPV in contexts with more progressive WEE legislation. This finding is contrary to a hypothesis that improvements in national legislation would decrease the differential IPV risk by vanguard WEE status. Based on these results, we recommend that policymakers strategize to ensure protective WEE legislation reaches economically active women living in communities that are not normative on women's economic participation. Future research efforts should strive to monitor the impact of legislation and understand how the implications of WEE legislation on partner violence differ within WEE normative versus non-normative environments.

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6. Chapter Six: Discussion

Economically empowering women can cause widespread disruption to traditional gender roles and, subsequently, male backlash.[1-7] Yet historically, our understanding of violent backlash against WEE is limited.[8-10] Ellsberg and colleagues have classified three generations of IPV interventions:[11] 1) those focused on supporting survivors and the criminalization of violence against women, 2) those focused on addressing individual risk factors through modifying knowledge, behaviors, and attitudes, and 3) those focused on changing norms and other structural factors to prevent IPV. Generation (3) of interventions is less developed, though it plays a pivotal role in gender equality in low-income countries; Jayachandran (2015) argues that norms change programming is vital to broader gender equality and economic development globally.[12] This dissertation explores the complex relationship between WEE and IPV through a socio-ecological[13] and social norms lens to inform generation (3) of IPV intervention.[14]

This dissertation addresses three gaps in the literature base on WEE and IPV: 1) lack of measurement knowledge on women going against the community norm in economic participation, or "vanguard WEE,"[15] 2) lack of understanding of how vanguard WEE relates to IPV, as opposed to simply individual economic participation in itself,[2,15-17] and 3) lack of understanding of how macro national-level policies that support women's economic participation impact relationships between WEE and IPV.[18] Using data from the Demographic and Health Surveys, gap one is addressed by creating an index that captures the level at which an individual woman goes against the community norm of economic participation, the "vanguard WEE" index (Aim 1).[19] Gap two is addressed by associating the

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vanguard WEE index, adjusting for the actual level of economic participation, with IPV and partner control (Aim 2). Gap three is addressed through testing the effect modification of a publicly available, validated index of national-level laws that support women's economic participation on the relationship between vanguard WEE and partner violence and control (Aim 3).

a. <u>Summary of findings</u>

Chapter 3 (Aim 1) proposed a strategy for identifying communities where it is not normative for women to be economically active. A count index of the number of WEE items a woman transgresses the norm on was constructed. The validity of the index was supported by a significant positive correlation with national financial discrimination towards women (p<0.001)[20] and an agency proxy (p<0.001). Adjusting for WEE, linear mixed effects regression models showed vanguard WEE associated with increased age (B 0.02, 95% CI 0.01, 0.02), decreased age of marriage (B -0.01, 95% CI -0.01, 0.00), decreased wealth (B -0.01, 95% CI -0.01, -0.01), and rurality (B 0.24, 95% CI 0.21, 0.27).

Using multilevel modeling across a broad and diverse set of low- and middle-income countries, Chapter 4 (Aim 2) presented evidence that women going against economic participation norms for women in their geographic community were at greater risk for IPV. As compared to women with no vanguard items, women with one vanguard WEE item had a 1-percentage point (pp) increase in physical IPV (marginal effect (ME) 0.01; 95% CI (0.01, 0.02)), a 1-pp increase in sexual IPV (ME 0.01; 95% CI (0.00, 0.02)), and a 2-pp increase in partner control (ME 0.02; 95% CI (0.01, 0.03)). Women with two vanguard WEE items had

a 1-pp increase for physical IPV (ME 0.01; 95% CI (0.01, 0.02)), a 1-pp increase for sexual

IPV (ME 0.01; 95% CI (0.01, 0.02)), and a 3-pp increase in partner control (ME 0.03; 95% CI

(0.02, 0.04)), as compared to women with no vanguard WEE items. Women with three or

more vanguard WEE items had a likely 4-pp increase in physical IPV (ME 0.04; 95% CI

(0.02, 0.05)), a 3-pp increase in sexual IPV (ME 0.03; 95% CI (0.02, 0.04)), and a 6-pp

increase in the probability of partner control (ME 0.06; 95% CI (0.04, 0.08)), as compared

to women with no vanguard WEE items. However, there was some evidence that the

relationship may be more complex at higher levels of vanguard WEE, though the analysis

was limited by sample size to assess this fully. The positive relationship between vanguard

WEE and past-year physical IPV was strongest among poorer women. There were

heterogeneous effects of vanguard WEE on IPV across countries, suggesting important

roles of national-level cultural or legal factors.

Applying moderation analysis to multilevel modeling in Chapter 5 (Aim 3), national-level

WEE legislation measured by the WBL index interacted significantly with vanguard WEE

on past-year physical IPV (B 0.05, 95% CI 0.02, 0.08) but not on past-year sexual IPV or

current partner control. WBL interaction with vanguard WEE on past-year physical IPV

was driven by the parenthood and pension sub-indices, in which the decrease in past-year

physical IPV probability associated with an increase in protective WEE legislation was

greater among non-vanguard women than vanguard women. As such, the difference in

past-year physical IPV by vanguard WEE status was greater in more progressive legal

contexts, for indices on laws that show significant interaction with vanguard WEE. National

WEE legislation, therefore, had differential associations with past-year physical IPV by

whether women go against the WEE norm at the local level. However, it is necessary to highlight overall very small effect sizes in observed significant effects within Aim 3.

b. <u>Study strengths and limitations</u>

This dissertation uses diverse methodologies to strengthen the literature base on IPV in the form of male backlash against women's economic participation. The main strengths of the dissertation research are as follows:

1. *A focus on the social ecology*: Historically, the literature on violence against women vastly focuses on women's individual-level risk factors to prevent IPV.[21,22] This dissertation's main strength is its comparison of women's individual behavior with their social context to explore IPV risk. The study interrogates influential factors at multiple layers of the socio-ecological model by utilizing national and community factors.

   a. Specifically, to our knowledge, this is the first study to develop a measure of "vanguard WEE" that directly compares individual-level WEE to community-level WEE using a variable that operates at the individual level (Aim 1), which is subsequently associated with individual-level IPV (Aim 2). The dissertation also sought to explore how well the constructed vanguard WEE index measures "going against the norm," contributing more broadly to the public health literature on social norms (Aim 1).

   b. In Aim 3, the dissertation studied another layer of the social ecology by exploring the moderating role of the national legal landscape on the relationship between IPV and going against the economic norm. The use of a

multi-national dataset allowed for such analysis. Legal and national-level

factors are rarely explored in the IPV literature.[18]

2. *External validity*: The generalizability of the findings is a strength of the study; few

studies employ data with advanced weighting covering many low- and middle-

income countries. Using DHS data from 49 and 44 countries in Aims 1 and 2,3,

respectively, the dissertation covers a substantial population of women living in

low- and middle-income contexts. The DHS employs robust weighting procedures

that were applied to all dissertation analyses, ensuring representativeness of the

broader population.[23]

3. *Statistical robustness:* The study's mixed effects models account for clustering at the

community and sampling strata levels and allow the relationship between the

primary independent variable and outcome variables to vary across communities

through random slopes. To this end, models accurately account for unobserved

latent variables related to the nesting within a sizeable multi-national population.

The dissertation research has several limitations; to the extent possible, strategies were

applied to mitigate data availability challenges:

1. *WEE validity:* The set of WEE proxies provided by the DHS is limited. Unavailable

WEE proxies that would be useful to our overall measure are measures of personal

assets (such as mobile phone, bank accounts, and savings), further descriptors of the

type of work women participate in (such as outside of the home, payment type,

gendered labor), and measures of financial autonomy, such as access to financial

information and having financial goals. Further, we apply a blanket definition of WEE without incorporating women's own views of what constitutes empowerment.

2. *Vanguard WEE validity:*

    a. The measure of vanguard WEE was limited to a descriptive norm referent without a measure of injunctive norms.[24] Measures of the perceived appropriateness of a woman working, participating in certain decisions, etc., by a community would significantly improve our measure of "going against the norm." Specifically, measuring the perceived injunctive norm on WEE by male community members would be ideal. We recommend future qualitative work explore injunctive norms for a vanguard WEE measure.

    b. Ideally, an indicator of women's internal motivation to be empowered to go against the grain would be included. In other words, does she choose to, or must she? For instance, working where no women work may be due to financial necessities rather than a personal will to work. Participating in decisions about household purchases in places where that is not the norm for women may be due to a lack of engagement by husbands or others in the household processes rather than the personal will to take on that decision.

    c. There is no gold standard measure for "going against the norm" to associate the vanguard WEE measure with to assess criterion validity. The dissertation uses a proxy of national-level financial discrimination towards women and non-economic empowerment proxies in the absence of a more robust gold standard measure.

3. *Cross-sectional design:* All analysis is cross-sectional; we cannot speak to causation. Reverse causation in which IPV causes or necessitates vanguard behavior is a possibility. This analysis does not ensure the temporality of the relationship between changes in IPV probability and going against the norm in WEE or WEE legislation. Using past-year IPV rather than lifetime IPV and using the WBL score of one year before the year of the DHS survey were some strategies taken to help mitigate this issue. The study's goal is not to claim causation but to explain, in part, the characteristics of women seeking economic opportunity in places where it is not normative.

4. *Endogeneity bias* is a persistent issue when working with WEE and violence. There may be something inherently different between women who seek out economic opportunity and women who do not, which may cause differences in violence risk. For instance, unavailable variables that would have ideally been adjusted for are measures on the partner dyad and husband characteristics. The study accounted for demographic factors available across the full dataset that associated with violence outcomes.

c. <u>Future research</u>

Building off findings from Chapter 3 (Aim 1), future research should further explore the proposed approaches to classifying communities as normative or non-normative on WEE items, as this has been largely unexplored in the literature. Validating such descriptive norms approaches to classifying communities with injunctive norms measures is needed. Aim 1 findings suggest that older, poorer, married women are more likely to go against the

norm in economic participation, yet more specific characteristics were unavailable in this data. More research is needed to understand who the vanguard women are to inform programming to benefit social norms change.

Chapter 4 (Aim 2) provided evidence of increased IPV risk among vanguard women, but this work is not causal, and future research should explore this through experimental evidence. Such a study could look at women over time who take on economic participation activities in communities where these activities are non-normative and compare these women to women who take on the same activities in communities where they are normative. Future qualitative research on male attitudes towards women taking on non-normative economic activities and how they may relate to concepts of masculinity would also be a valuable contribution to the male backlash literature. Aim 2 found the relationship between IPV risk and vanguard WEE may be more complicated among highly vanguard women, with some tests showing significantly increased risk and others showing non-significant increased risk. It may be that highly vanguard women are unique on a characteristic that is not captured within our data, and this should be further explored in future research.

Chapter 5 (Aim 3) demonstrated that progressive WEE legislation associated with physical IPV among women differently depending on whether women were going against the norm on economic participation. Future research should explore the mechanisms behind why vanguard women do not observe similar decreases in physical IPV risk associated with improvements to WEE legislation compared to non-vanguard women. An interesting

finding of this study is that laws on assets and inheritance correlate with increased physical IPV probability, and even more so for vanguard women. Further research should explore the mechanisms through which WEE legislation could relate to male backlash within communities where economic participation is non-normative.

   d. Study implications

This dissertation shows that community WEE norms are important factors to consider in the relationship between individual-level women's economic participation and partner violence. Subsequently, policy and programmatic recommendations are as follows:

1. The dissertation calls for norms-sensitive WEE programming incorporating rigorous and locally informed participant safeguarding systems. Given WEE programming is typically focused on introducing women to economic participation that is locally non-normative, programming should have a backlash-monitoring system before, during, and after intervention implementation. Conducting contextualized formative research on effectively encouraging reporting and response to violent backlash before programming is launched should be enforced as standard protocol for WEE efforts. Practitioners across organizations have similarly laid this out.[25] For example, the Prevention Collaborative's Practice Brief on programmatic unintended consequences such as partner backlash provides guidance on monitoring and addressing backlash.[26] Programs should ensure locally informed help-seeking guidance for participants and broader community members who report violence. Such efforts are particularly important for poorer women, identified in this dissertation as more likely to experience violent physical backlash.

2. WEE programs should work with male partners and community stakeholders to prevent violent backlash. Qualitative process evaluation with male community members and partners should be part of program design for understanding participant experiences and couple dynamics. As recommended by a recent evidence review of IPV and WEE programming, cultivating relationships with local leadership allows for effective partnership with male community members for capacity building, sensitization, and clarification of values that together can prevent violent unintended consequences.[27]

3. Practitioners designing WEE programs can implement a similar vanguard WEE count index to what was developed in Aim 1 to understand the level at which women are transgressing the norm to identify individuals who may need additional safeguarding support. Such efforts would help identify vanguard women who may be uniquely placed to create change within their communities if supported and enabled.

4. Programming should be sensitive to the legal WEE landscape in the setting, and in countries with more protective WEE legislation, take extra effort to ensure women in non-normative WEE communities benefit from these policies. We recommend policymakers strategize to ensure protective WEE legislation reaches women economically active in non-normative WEE communities.

Broadly, dissertation findings highlight the importance of community norms change to prevent violence. Many IPV-prevention programs and evaluations that focus on norms change focus on norms specific to violence perpetration; we find here the relevance of the

contrast of individual behavior and the norm. Dissertation recommendations to further explore the effects of norms are in line with other work covering the importance of norms change around gender roles for partner violence prevention, some of which is highlighted in the 2019 WhatWorks systematic review of violence prevention among women and girls.[28-30]

e. Conclusion

In studying women that are on the vanguard of economic participation, the dissertation explores the characteristics of progressive women and the risks they may face. Connell's Theory on Gender and Power attests that gender relations are reoccurring processes that are subject to resistance, disruption, and change.[31] Eliminating gender power imbalances can occur through challenging the three main pillars of the gender system, or the overall structure of gender relations within a society: 1) divisions of labor, 2) division of power, and 3) cathexis, or the social norms that dictate how people should act. Women who are on the vanguard of economic participation challenge these pillars: they contest the social norm, contest the gendered division of labor through participating in predominantly male financial spaces, and contest the gendered division of power given strong links between money and power.

This dissertation unveils violent backlash against disruptions to the gender system, with important implications for practical violence-prevention work around women's entrance into public financial spaces, including the reduction of harmful unintended consequences in gender equality programming efforts. Freedom from violence is a key component of

women's empowerment broadly, and effective WEE cannot be achieved without ensuring

women's safety in the process.

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7. Chapter Seven: Appendix

Figure 7.1 Mixed effects logistic regression of vanguard WEE on past-year physical IPV, by country, accounting for survey weighting, strata fixed effects, community random effects, adjusting for total WEE items, age, age of marriage, parity, wealth, and rurality

Country	Estimate
Afghanistan	-0.01±0.03
Angola*	0.04±0.03
Armenia	-0.01±0.01
Benin	0.01±0.02
Burundi	0.02±0.02
Cambodia	-0.01±0.02
Cameroon	-0.01±0.02
Chad***	-0.05±0.03
Colombia	-0.03±0.03
DR	0.02±0.02
DRC*	0.03±0.02
Egypt***	0.03±0.01
Ethiopia*	0.03±0.03
Gambia	-0.01±0.02
Guatemala**	0.02±0.01
Haiti	0.01±0.02
India***	0.03±0.01
Jordan***	0.04±0.02
Kenya	-0.05±0.06
Liberia	0.05±0.06
Madagascar*	0.02±0.02
Malawi	0.03±0.03
Maldives	0.01±0.02
Mali	0.01±0.03
Mauritania*	0.01±0.01
Mozambique	0.01±0.03
Myanmar	0.02±0.02
Namibia	-0.02±0.06
Nepal*	0.03±0.02
Nigeria	0±0.01
Pakistan***	0.05±0.03
Phillipines**	0.01±0.01
PNG	-0.03±0.04
Rwanda	0.02±0.04
Senegal	0±0.04
Sierra Leone	0.02±0.04
South Africa	0±0.04
Tanzania	0.01±0.02
Tijikistan	0±0.03
Timor Leste	0.03±0.04
Togo	-0.01±0.02
Uganda	-0.01±0.02
Zambia**	0.03±0.02
Zimbabwe*	0.02±0.02
Overall***	0.01±0.01

Figure 7.2 Mixed effects logistic regression of vanguard WEE on past-year sexual IPV, by country, accounting for survey weighting, strata fixed effects, community random effects, adjusting for total WEE items, age, age of marriage, parity, wealth, and rurality

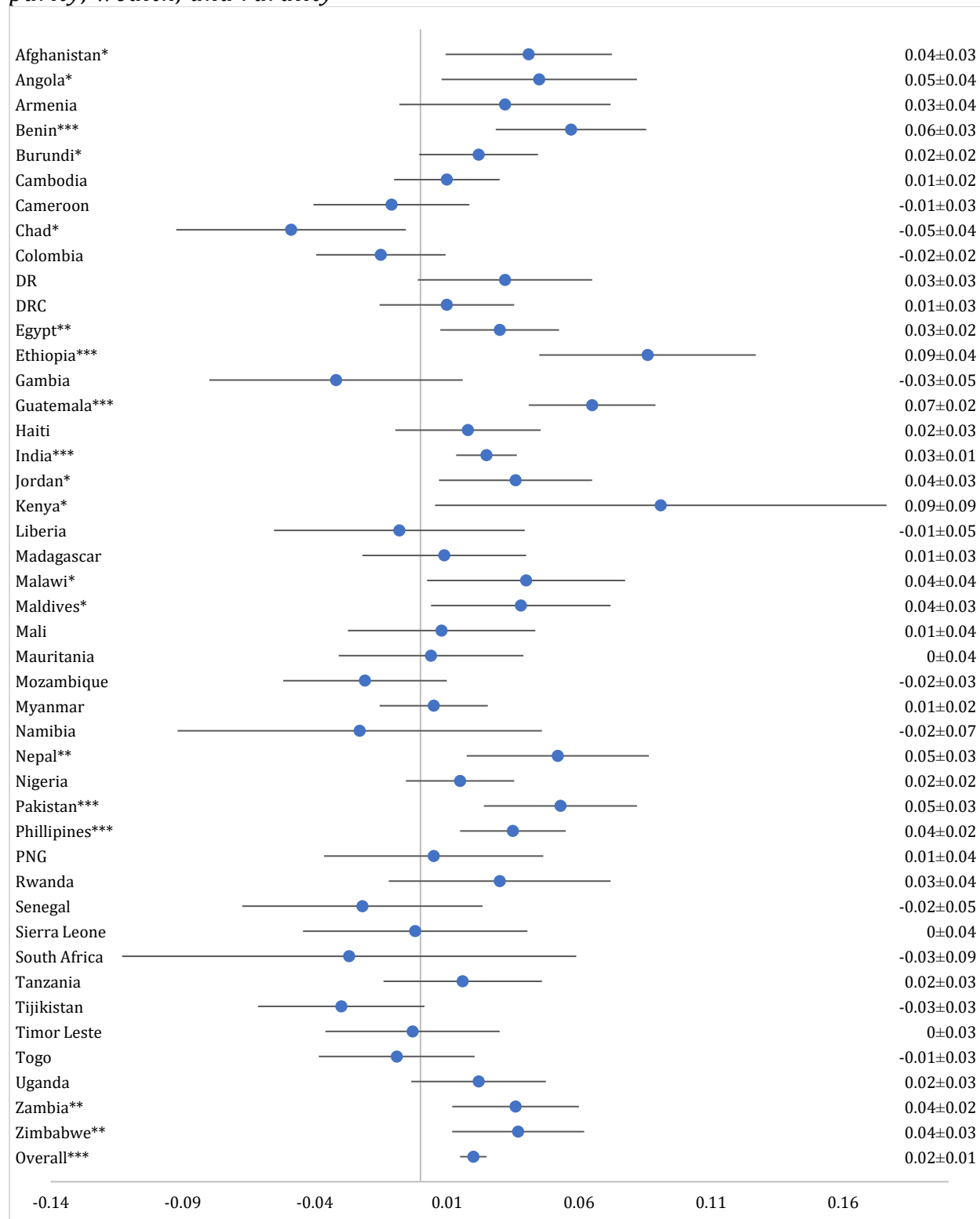| Country	Estimate
Afghanistan	0.01±0.02
Angola*	0.02±0.01
Armenia	0±0.004
Benin	0±0.01
Burundi	0.02±0.02
Cambodia	0.01±0.01
Cameroon	0.01±0.02
Chad	-0.02±0.02
Colombia	-0.01±0.01
DR	0.01±0.01
DRC***	0.04±0.02
Egypt**	0.01±0.01
Ethiopia	0.01±0.02
Gambia	-0.01±0.01
Guatemala**	0.01±0.01
Haiti	0.01±0.02
India***	0.02±0
Jordan**	0.02±0.01
Kenya**	-0.06±0.04
Liberia	0±0.02
Madagascar***	0.02±0.01
Malawi	0.02±0.02
Maldives	0±0
Mali	-0.01±0.02
Mauritania*	0.02±0.01
Mozambique	0±0.01
Myanmar	0±0.01
Namibia	-0.02±0.04
Nepal	0.01±0.01
Nigeria	-0.01±0.01
Pakistan*	0.02±0.01
Phillipines**	0.01±0.01
PNG	-0.03±0.03
Rwanda	0.01±0.02
Senegal	-0.02±0.02
Sierra Leone	0.01±0.02
South Africa	0.02±0.04
Tanzania	-0.01±0.01
Tijikistan	0±0.01
Timor Leste*	0.01±0.01
Togo	-0.01±0.01
Uganda	-0.01±0.02
Zambia**	0.02±0.01
Zimbabwe***	0.03±0.01
Overall***	0.01±0.01

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Figure 7.3 Mixed effects logistic regression of vanguard WEE on current partner control, by country, accounting for survey weighting, strata fixed effects, community random effects, adjusting for total WEE items, age, age of marriage, parity, wealth, and rurality

Country	Estimate
Afghanistan*	0.04±0.03
Angola*	0.05±0.04
Armenia	0.03±0.04
Benin***	0.06±0.03
Burundi*	0.02±0.02
Cambodia	0.01±0.02
Cameroon	-0.01±0.03
Chad*	-0.05±0.04
Colombia	-0.02±0.02
DR	0.03±0.03
DRC	0.01±0.03
Egypt**	0.03±0.02
Ethiopia***	0.09±0.04
Gambia	-0.03±0.05
Guatemala***	0.07±0.02
Haiti	0.02±0.03
India***	0.03±0.01
Jordan*	0.04±0.03
Kenya*	0.09±0.09
Liberia	-0.01±0.05
Madagascar	0.01±0.03
Malawi*	0.04±0.04
Maldives*	0.04±0.03
Mali	0.01±0.04
Mauritania	0±0.04
Mozambique	-0.02±0.03
Myanmar	0.01±0.02
Namibia	-0.02±0.07
Nepal**	0.05±0.03
Nigeria	0.02±0.02
Pakistan***	0.05±0.03
Phillipines***	0.04±0.02
PNG	0.01±0.04
Rwanda	0.03±0.04
Senegal	-0.02±0.05
Sierra Leone	0±0.04
South Africa	-0.03±0.09
Tanzania	0.02±0.03
Tijikistan	-0.03±0.03
Timor Leste	0±0.03
Togo	-0.01±0.03
Uganda	0.02±0.03
Zambia**	0.04±0.02
Zimbabwe**	0.04±0.03
Overall***	0.02±0.01

Table 7.1 Aim 2 sensitivity check: Mixed effects linear regression of vanguard WEE on past-year physical IPV, past-year sexual IPV, and current partner control, weighted

	Past-year Physical IPV	Past-year Sexual IPV	Current Partner Control
	Coeff (95% CI)	Coeff (95% CI)	Coeff (95% CI)
Vanguard items+			
0	Ref	Ref	Ref
1	0.01*** (0.01, 0.02)	0.01*** (0.01, 0.02)	0.02*** (0.01, 0.03)
2	0.02*** (0.01, 0.03)	0.01*** (0.00, 0.02)	0.03*** (0.02, 0.04)
=>3	0.04*** (0.03, 0.06)	0.03*** (0.02, 0.04)	0.06*** (0.04, 0.08)
Observations	189,407	189,375	188,561

*p<0.05; **p<0.01; ***p<0.001

Linear mixed effects models account for survey weighting, country fixed effects, strata and community random effects, adjust for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP, and allow for random slopes for vanguard across communities
+Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two-thirds of the community-level distribution within the community

Table 7.2 Aim 2 sensitivity check: Mixed effects logistic regression of vanguard WEE on past-year physical IPV, past-year sexual IPV, and current partner control, odds ratios, weighted

	Past-year physical IPV	Past-year Sexual IPV	Current Partner Control
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)
Vanguard items+			
0	Ref	Ref	Ref
1	1.34*** (1.24, 1.45)	1.89*** (1.65, 2.18)	1.19*** (1.12, 1.27)
2	1.23*** (1.10, 1.37)	1.62*** (1.34, 1.96)	1.23*** (1.14, 1.32)
=>3	1.09 (0.93, 1.27)	1.20 (0.93, 1.56)	1.37*** (1.21, 1.55)
Observations	189,407	189,375	188,561

*p<0.05; **p<0.01; ***p<0.001

Logistic mixed effects models account for survey weighting, country fixed effects, strata and community random effects, adjust for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP, and allow for random slopes for vanguard across communities
++Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two-thirds of the community-level distribution within the region

Table 7.3 Aim 2 sensitivity check: Mixed effects logistic regression of vanguard WEE coded as binary on past-year physical IPV, past-year sexual IPV, and current partner control, odds ratios, weighted

	Past-year physical IPV	Past-year Sexual IPV	Current Partner Control
	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)
Vanguard items[+]			
0	Ref	Ref	Ref
=>1	1.24*** (1.15, 1.34)	1.59*** (1.28, 1.82)	1.18*** (1.11, 1.25)
Observations	189,407	189,375	188,561
*p<0.05; **p<0.01; ***p<0.001 Logistic mixed effects models account for survey weighting, country fixed effects, strata and community random effects, adjust for total WEE items, age, age of marriage, parity, wealth, rurality, country GDP, and allow for random slopes for vanguard across communities [++]Number of items vanguard; vanguard on an item if has the item and lives in a community where the item prevalence is <35% or lives in a community with prevalence =>35% and <=65% and community's prevalence is in the bottom two-thirds of the community-level distribution within the region			

Figure 7.4 Country-level associations between WEE and any past-year IPV or current partner control, 44 countries, weighted

<div align="center">
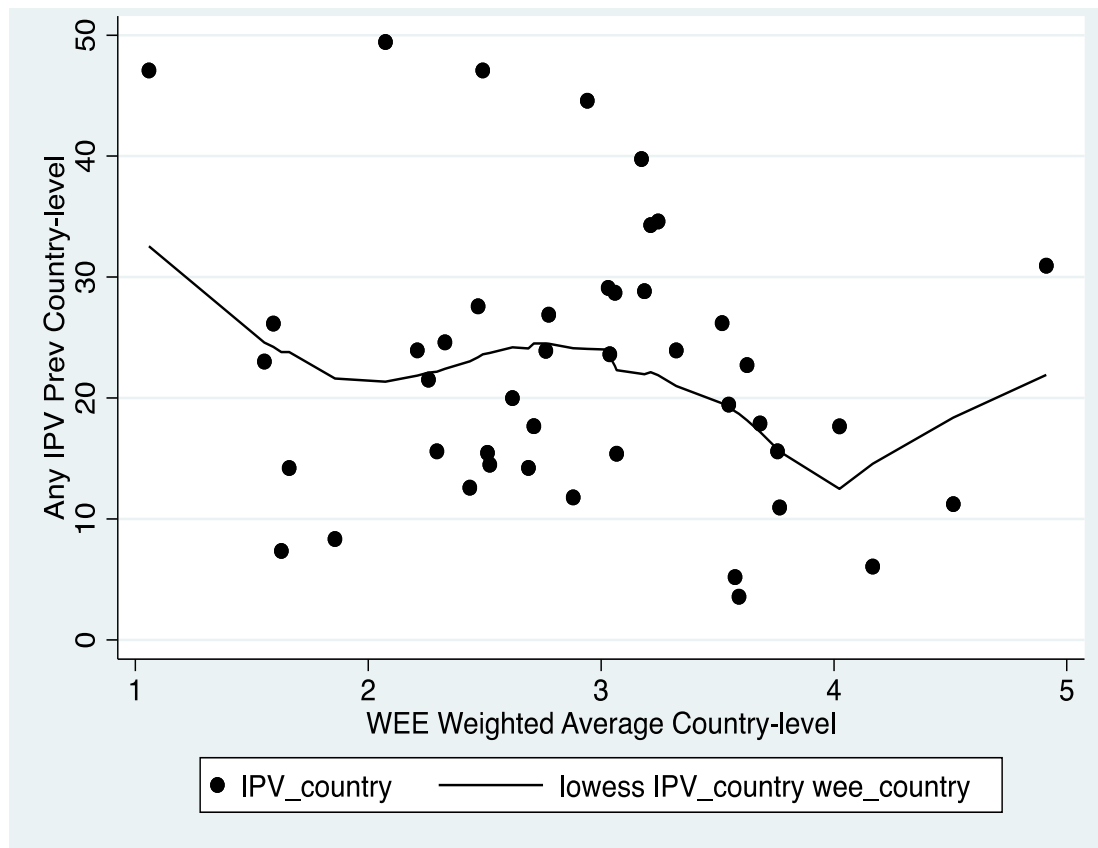
Curriculum Vitae

Anaise Marie Williams, MPH, PhDc

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EDUCATION

Doctor of Philosophy in Population, Family and Reproductive Health   Aug 2023
Johns Hopkins University Bloomberg School of Public Health

Master of Public Health   May 2017
Program on Forced Migration and Health
Columbia University Mailman School of Public Health

Bachelor of Arts in Anthropology   May 2013
University of Rochester

PROFESSIONAL EXPERIENCE

Research Consultant   March 2020-Present
World Bank Group, Washington D.C., USA
South Asia Gender Innovation Lab
South Asia Chief Economist Office

Graduate Student Researcher PMA YRDS   Aug 2020-Present
Johns Hopkins Bloomberg School of Public Health, Maryland, USA
Principle Investigator: Dr. Michele Decker

Graduate Student Researcher Alliance for a Healthier World   Oct 2019-Aug 2022
Johns Hopkins Bloomberg School of Public Health, Maryland, USA
Principle Investigator: Dr. Michele Decker

Graduate Student Researcher PAIRS study   Aug 2021-Jan2021
Johns Hopkins School of Nursing, Maryland, USA
Principle Investigator: Dr. Jacqulyn Campbell

Program Manager Readymade Garments Productivity Project   July 2017- Aug 2019
University of Oxford Development Economics Department, Dhaka, Bangladesh
Principle Investigator: Dr. Christopher Woodruff

Data Analysis Consultant   July 2017- Oct 2019
Promundo International, Remote
Principle Investigator: Dr. Ruti Levtov

Graduate Student Researcher Cross-project   Dec 2015 – July 2017
Columbia University Child Protection in Crisis (CPC) Learning Network
New York, USA and Jakarta, Indonesia and Asosa, Ethiopia
Principle Investigator: Dr. Lindsay Stark

Program Assistant Cross-project   Dec 2014- Aug 2015
Medical Care Development, Public Health, Maine, USA

RESEARCH AWARDS AND SCHOLARSHIPS

NIH Traineeship in Interdisciplinary Research Training on Violence   2020-2022
National Institute of Child Health and Development (NICHD)

Lisa Paine Graduate Fellowship   2021
Johns Hopkins Bloomberg School of Public Health

U.S. Fulbright Research Fellowship to Dhaka, Bangladesh   2013-2014
U.S. Department of State

Social Science Excellence in Research Award   2013
Harvard National Collegiate Research Conference

Helen S. Jones Award for Excellence in Social Science Research   2013
University of Rochester Dean of the College

Honors Thesis Presentation Award   2013
University of Rochester Anthropology Department

TEACHING ASSISTANTSHIPS

Gender-Based Violence in Research, Practice and Policy   2022
Johns Hopkins Bloomberg School of Public Health

Fundamentals of Program Evaluation   2021
Johns Hopkins Bloomberg School of Public Health

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Peer Reviewed Publications
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7. Sommer, M., Muñoz-Laboy, M., Williams, A., Mayevskaya, Y., Falb, K., Abdella, G., & Stark, L. 2018. How gender norms are reinforced through violence against adolescent girls in two conflict-affected populations. Child abuse & neglect, 79, 154-163. https://doi.org/10.1016/j.chiabu.2018.02.002

8. Williams, A., Sarker, M., & Ferdous, S. T. 2017. Cultural Attitudes toward Postpartum Depression in Dhaka, Bangladesh. Medical Anthropology, 1-12. https://doi.org/10.1080/01459740.2017.1318875

Manuscripts under Review
1. Carona, C., Williams, A., Gummerson, E., Decker, M., Akilimali, P., Gichangi, P., OlaOlorun, F., Guiella, G., Ahmed, S., Anglewicz, P. 2023. Development of a Cross-Country Scale to Measure Women's Economic Empowerment in the Democratic Republic of Congo, Kenya, Nigeria, and Burkina Faso. *Accepted by Feminist Economics*

Working Papers
1. Brown, C., Kandpal, E., Lee, J., & Williams, A. 2022. Unequal Households or Communities? : Decomposing the Inequality in Nutritional Status in South Asia. Policy

Research Working Paper;10009. World Bank, Washington, DC: © World Bank. https://openknowledge.worldbank.org/handle/10986/37333 License: CC BY 3.0 IGO

2. Bussolo, M., Sarma, N., & Williams, A. 2021. It Takes Two (To Make Things Right) : Women's Empowerment and Couple Concordance in South Asia. Policy Research Working Paper; No. 9545. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/35141 License: CC BY 3.0 IGO

Policy and Evidence Briefs
1. Williams, A., Heise, L., & Tas, E. 2022. How Well do Economic Empowerment Efforts Prevent Intimate Partner Violence in South Asia. Washington, D.C.: World Bank Group.

2. Williams, A., Heise, L., & Tas, E. 2022. How Well do Economic Empowerment Efforts Prevent Child Marriage in South Asia. Washington, D.C.: World Bank Group.

3. PMA Agile/Gender & ICRHK. Gender & COVID-19 Study: Economic Outcomes and Time Use Brief. 2020. Baltimore, Maryland, USA & Nairobi, Kenya: Bill & Melinda Gates Institute for Population and Reproductive Health, Johns Hopkins University Bloomberg School of Public Health & International Centre for Reproductive Health Kenya. Prepared by Anaise Williams