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Intimate Partner Violence and Women's Economic and Non-Economic Activities in Minya, Egypt

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Abstract Intimate partner violence (IPV) against women is widespread, but its implications for their economic and non-economic activities are understudied. Leveraging new data from 564 ever-married women aged 22–65 in rural Minya, Egypt, we estimated logistic regressions and zero-inflated negative binomial regressions to test spillover, compensation, and patriarchal bargaining theories about the influences of women's exposure to IPV on their engagement in and time spent on market, subsistence, domestic, and care work. Supporting compensation theory, exposures to lifetime, recent, and chronic physical or sexual IPV were associated with higher adjusted odds of performing market work in the prior month, and exposures to recent and chronic IPV were associated with higher adjusted odds of performing subsistence work in this period. Supporting compensation and patriarchal bargaining theories, exposures to recent and chronic IPV were associated with more time spent on domestic work in the prior day. Supporting spillover and patriarchal bargaining theories, exposures to lifetime IPV of all forms were associated with lower adjusted odds of performing mostly nonspousal care work in the prior day, and this association was partially mediated by women's generalized anxiety. Women in rural Minya who are exposed to IPV may escalate their housework to fulfill local norms of feminine domesticity while substituting economic activities for nonspousal care work to enhance their economic independence from violent partners.

Keywords Egypt · Intimate partner violence (IPV) · Market work · Non-economic activities Subsistence work

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Introduction

Intimate partner violence (IPV) refers to assaultive and coercive behaviors that adults use against their dating, cohabiting, or marital partners (Holden 2003). Globally, women's lifetime exposure to physical IPV ranges from 10 % to 71 % (Douki et al. 2003; Garcia-Moreno et al. 2006; Johnson et al. 2010; Watts and Zimmerman 2002), and its adverse health effects for women and children are well known (e.g., Yount et al. 2011). Less attention has been paid to the implications of IPV for women's economic and non-economic activities, with the former including market and subsistence work, and the latter including domestic and care work. In poorer countries, the implications of IPV for women's economic and non-economic activities are even less clear, partly because nonwage market and subsistence work are poorly documented, and time-use studies of women's non-economic activities are rare (e.g., Dixon 1982; Donahoe 1999; Hirway and Jose 2011; Langsten and Salem 2008). A direct assessment of how IPV may influence the full range of women's economic and non-economic activities is lacking. Filling this gap in lower-income settings is important given the associations of women's economic and non-economic activities with socially desired outcomes, including lower fertility, investments in children, and the alleviation of household poverty (Hoddinott and Haddad 1995; Mason 1987; Vyas and Watts 2009). In this study, we leverage new data from 564 ever-married women aged 22–65 in rural Minya, Egypt, to understand the influences of women's exposure to IPV on their engagement in and time spent on market, subsistence, domestic, and care work.

Background

Conceptualizing Women's Work: Economic and Non-Economic Activities

The International Labor Organization (ILO) (1982:2) has defined economic activity to include "all production and processing of primary products whether for the market for barter or for own consumption, the production of all other goods and services for the market and, in the case of households which produce such goods and services for the market, the corresponding production for own consumption." Economic activity thus includes market work (the production of goods and the provision of services for remuneration in cash or kind) as well as subsistence work (the production of goods and the provision of services for household consumption) (Anker 1990; ILO 1982).

Despite this definitional consensus, social scientists often disagree on the classification of activities involving household production. For example, Hussmans' (2007) list of economic activities includes making clothing and constructing or repairing housing for household consumption, but Anker's (1983) list includes constructing and improving (but not repairing) one's house as well as making clothing for household consumption out of primary (but not processed) products. Given these challenges, survey researchers often disregard subsistence activities, resulting in large underestimates of women's economic activity in poor settings (Langsten and Salem 2008).

Despite disagreement over what to include as economic activities, many social scientists agree to exclude two classes of non-economic activity performed without pay: domestic work and care work. The former denotes unpaid chores done to maintain family members or a home (Shelton and John 1996), including meal preparation, house cleaning, and

laundry. Care work refers to unpaid activities done in the service of others, often dependent children and older adults (Folbre 1995). These unremunerated activities differentially fall to women in many settings (Bianchi et al. 2000; Craig and Bittman 2008; Craig and Mullan 2011; Hirway and Jose 2011; Presser 1994; Sayer et al. 2004).

Implications of IPV for Women's Work in Poor Settings: Competing Theories

These definitions situate three theories about the influence of IPV on women's economic and non-economic activities: spillover, compensation, and patriarchal bargaining. Figure 1 depicts, for each theory, how a woman's exposure to IPV is expected to influence her engagement in and time spent on economic and non-economic activities. We discuss each perspective in the subsections that follow.

Family–Work Spillover

Studies, based largely in the United States, focus on the negative implications of IPV for women's market and care work (e.g., Levendosky and Graham-Bermann 2001; Swanberg et al. 2007). These studies are rooted in sociological and psychological theories of stress (Repetti 1987), which describe spillover effects between family and work (e.g., Crouter 1984; Perry-Jenkins et al. 2000; Repetti and Wang 2009) and between subsystems of relationships within the family (e.g., Erel and Burman 1995; Krisknakumar and Buehler 2000; Levendosky et al. 2006). In this literature, the term *spillover* describes the expression in one domain (such as women's market work) of feelings or behaviors that were engendered in another domain (such as the marital dyad). In the case of negative spillover (hereafter, called *spillover*), experiences in one domain that leave a person feeling frustrated, depressed, or ineffective may have adverse implications in another domain, contributing, for example, to withdrawal or hostility in interactions, dissatisfaction with one's role, or reduced performance, especially through adverse effects on mental or physical health (Sandberg et al. 2012). Historically, research on spillover has focused on spillover from work to family life (see Sandberg et al. 2012). Recently, researchers have begun to assess how poor marital quality, conflict, and IPV may have adverse short- and long-term influences on various domains of (especially women's) work (Frone et al. 1997; Sandberg et al. 2012; Swanberg et al. 2005).

In unmediated analyses of data from the United States, low marital satisfaction and high marital discord have been related longitudinally to low job satisfaction in a national married sample (Rogers and May 2003). Marital discord—specifically, IPV—also have been

	Economic Activities		Non-Economic Activities	
	Market Work	Subsistence Work	Domestic Work	Care Work
Family–Work Spillover	–	–	–	–
Compensation	+	+	+	+
Patriarchal Bargaining	–	–	+	– (nonspousal care work)

Fig. 1 Theoretical perspectives and associated hypotheses concerning the influence of women's exposure to intimate partner violence on their economic and non-economic activities

positively related to arguments at work (Bolger et al. 1989), work loss (Forthofer et al. 1996), work disability claims (Appleberg et al. 1996), withdrawal from market work (MacEwen and Barling 1994), subsequent employment instability (Staggs et al. 2007), and unemployment (Byrne et al. 1999). Related research in poorer settings is limited, focuses narrowly on the influences of IPV on women's earnings and market work, uses data in which market work is likely underreported, and shows conflicting results (Morrison and Orlando 1999, 2005; Sanchez and Ribeiro 2004).

In terms of potential mediation of these relationships, women's exposure to IPV has been associated with various adverse psychological outcomes (Jordan et al. 2010) as well as with physical injuries and diverse injury- and stress-related chronic conditions (Dutton et al. 2006). In turn, selected measures of poorer cognitive and physical health have adversely affected market wages (e.g., Alderman et al. 1996; Schultz 2005). In actual mediation models, poorer maternal psychological functioning has partially mediated the relationship of maternal exposure to IPV and parenting (or care work) (Levendosky and Graham-Bermann 2001). Among lower-income women of color in the United States, a sum of reported physical and mental health problems has not mediated the relationship of IPV with three-year employment stability (Staggs and Riger 2005), but poorer physical health has partially mediated the relationship of severe physical IPV with reduced work hours (Tolman and Wang 2005). Among middle-class white women in the United States, poor physical and mental health have at least partially mediated the relationships of poly-IPV victimization with lower market-work satisfaction and productivity (Banyard et al. 2011). In Singapore, poor mental health has partially mediated the relationship of marital distress with work satisfaction (Sandberg et al. 2012), but the relationship of IPV with all domains of women's economic and non-economic activities through mental and/or physical health is unstudied internationally. Thus, according to theories of family–work spillover, a woman's exposure to IPV will universally reduce her propensity to engage in and her time spent on market, subsistence, domestic, and care work.

Compensation

In the sociological literature, theories of family–work spillover often are contrasted with theories of *compensation*, the process by which a person seeks to offset dissatisfaction in one domain by pursuing satisfaction in another (Engfer 1988; Gutek et al. 1988). Reactive compensation occurs when a person redresses adverse experiences in one relational or activity domain by seeking contrasting experiences in a different one (Evans and Bartolome 1986; Kando and Summers 1971). With respect to research on IPV, proponents of this perspective expect a positive relationship between a woman's exposure to IPV and her market, subsistence, domestic, and (nonmarital) care work. Specifically, a woman exposed to IPV will seek to offset the hardships in her marriage by engaging in and/or allocating more time to these other activities.

In the United States, researchers have tested theories of compensation mainly with respect to women's parenting (or care work) after exposure to IPV. Corroborating the theory, exposed mothers have provided as much or more structure for their children (Holden and Ritchie 1991), have shown positive parenting behaviors (Moore and Pepler 1998), and have been more empathic toward their children (Levendosky et al. 2000). In

analyses of national (and in one case, panel) data from North America, exposed mothers have had poorer initial scores for the home environment (Casanueva et al. 2008), positive discipline, nurturance, and consistency (Letourneau et al. 2007), but their behavior eventually has resembled that of unexposed mothers (Letourneau et al. 2007). Yet, two meta-analyses of mainly U.S.-based studies have shown little support for theories of compensation; marital discord or low marital quality were associated with adverse spillover effects on women's (parental) care work (Erel and Burman 1995; Krisknakumar and Buehler 2000). New studies in poorer settings also have refuted compensatory theory regarding the effects of women's exposure to IPV on infant care (Misch and Yount 2013; Zureick-Brown et al. 2013). No studies in poorer settings have tested whether women engage more in market, subsistence, and domestic work in response to IPV. Thus, our study fills a large gap in research. In sum, compensation theorists posit that a woman exposed to IPV will universally increase her propensity to engage in and spend time on market, subsistence, domestic, and care work to offset the adversities of a violent marriage.

Patriarchal Bargaining

A final perspective suggests that women exposed to IPV will strategically reallocate their time to maximize their life chances, given locally prevailing conditions of patriarchy. Kandiyoti (1988) described one form of male domination—classic patriarchy—that has appeared in parts of North Africa, the Muslim Middle East, and South and East Asia. Under classic patriarchy, girls are married at relatively young ages into households headed by their husbands' fathers. A new bride is subordinate to the men and senior women in the house, and the patrilineage appropriates her labor and progeny. The expectation with time of "inheriting the authority of senior women" encourages women to internalize this form of patriarchy (Kandiyoti 1988:279). Thus, women maximize their security by using conformist strategies that ultimately maintain the status quo.

Yount (2011) explored in qualitative research the role of patriarchal bargaining in women's responses to IPV in a Southern Egyptian governorate. In that sample, women exposed to IPV often increased their efforts to enact a "good wife" role (MacLeod 1991) to oblige their husband morally to act as a "good man." The good wife, informants explained, is obedient, intuits her husband's desires, and is competent in her domestic chores (Yount 2011). In return, the good husband should be self-restrained, provide financially, and protect his wife and children (Abu-Seif 2010). Yet, a husband's restraint is never certain, so a woman must persistently enact the good wife to avoid further violence, thereby supporting the patriarchal status quo. Thus, according to patriarchal bargaining theorists, a woman's exposure to IPV will be (1) positively associated with her engagement in domestic work, a wifely duty that serves her husband's needs, and (2) negatively associated with her engagement in market, subsistence, and nonspousal care work, which may compete with her wifely duties.

In sum, our study is the first to test systematically theories of negative spillover, positive compensation, and strategic patriarchal bargaining to explain the influence of women's exposure to IPV on their economic and non-economic activities in a poor setting.

Setting

Our study site, the governorate of Minya, is located some 250 km south of Cairo and houses about 4.2 million residents (United Nations Development Program (UNDP) and Institute for National Planning (INP) 2008). Typically, Southern Egyptians have less schooling and higher rates of poverty, unemployment, and mortality than Northern Egyptians (UNDP and INP 2008). Minya ranks third from last among all 26 governorates on indicators of human development, and only 29 % of women there are in the labor force, according to some measures (UNDP and INP 2008). In 1995, 27 % of women aged 15–54 in Minya reported any lifetime exposure to physical IPV (Yount 2005); in 2005, reported rates of any lifetime IPV were 35 % in rural Southern Egypt (El-Zanaty and Way 2006).[1]

Sample

Our sample included ever-married rural women aged 22–65 from Minya, who participated in the 2005 Egypt Demographic and Health Survey (EDHS) and our follow-up survey in 2012.[2] The 2005 EDHS sample was drawn from an updated version of the 1996 national census frame, using an urban/rural stratified three-stage cluster design (El-Zanaty and Way 2006). Nationally, 22,807 sampled households were interviewed (a response rate of 98.9 %), in which 19,565 ever-married women aged 15–49 completed a Woman Questionnaire (a response rate of 99.5 %). In a one-third subsample of interviewed households, one ever-married woman aged 15–49 from each household (n = 5,711) was selected randomly (Kish 1949) to complete an IPV module, of whom 5,613 (98.3 %) participated.

The sample for our 2012 study was drawn from the 1,122 women in rural Minya who completed the 2005 EDHS Woman Questionnaire. The subsample selected for follow-up included all 328 women who completed the IPV module in 2005. An additional 514 households were randomly selected from the remaining households for inclusion; and in households with more than one eligible woman, one was selected using the Kish method. Of the 842 selected women, 633 were located, and 72 % (608) completed follow-up interviews. Attritors and nonattritors were similar on 14 attributes measured in 2005, including marital and work status as well as lifetime exposure to IPV (results available upon request). Of the 608 women interviewed in 2012, those with missing data on outcomes (n = 11) and then on IPV (n = 33) were excluded, resulting in a sample of 564 women with complete data on all outcomes and exposures. For 34 included women with missing data on at least one covariate, we imputed the median value for the covariate. Included and excluded women were similar on 32 of 43 measured attributes (results available upon request).

[1] In 1995, the prevalence of lifetime physical IPV was estimated from one question about being "beaten" by one's husband. In 2005, this prevalence was estimated from several questions about a husband's perpetration of acts of physical, sexual, or psychological IPV.

[2] The 2005 EDHS sample was estimated to be age 15–49, but the 2012 follow-up sample reported ages from 22 to 65. In 2012, 22 women reported ages over 56 (the highest age that should have been reported based on data from the 2005 EDHS). We used women's ages as reported in 2012.

Data

Data Collected

In the 2005 EDHS, selected households received a Household Questionnaire asking about all members' demographic attributes, amenities of the dwelling, and household assets (El-Zanaty and Way 2006). A Woman Questionnaire asked, among other things, about eligible respondents' education, marital history, fertility history, and husband's characteristics. Our 2012 follow-up survey was informed by in-depth interviews about women's work and exposure to IPV with 30 married women aged 22–52 and exposed (n = 16) or not exposed (n = 14) previously to physical IPV.

The 2012 follow-up survey included Household and Woman Questionnaires, which gathered data similar to that collected in the 2005 EDHS. The Woman Questionnaire also included a module on women's economic and non-economic activities, an expanded module on IPV, and a module on mental health. The activities module drew from prior studies in Egypt and other poor settings (Anker 1983, 1990; Anker and Anker 1989, 1995; Anker et al. 1987; Dixon 1982; Langsten and Salem 2008) and asked about women's engagement in any of 20 market or subsistence activities in the prior 12 months (Table 5 in the appendix). For each reported activity, questions asked about any return in cash or kind, number of hours spent in the past month, and earnings in the past month. This module also included questions developed from our qualitative work about performing in the prior 24 hours any of seven domestic chores (e.g., cleaning) and seven care-related activities (e.g., obtaining health care for children) (Table 5) as well as minutes spent during the prior day on each reported activity.

Because only a subset of participants in 2012 received questions about IPV in 2005, the IPV module in 2012 asked whether the woman had experienced IPV both before and after her interview in 2005 and in the prior year. The items for all time periods covered exposure to acts of psychological, physical, and sexual IPV, and were nearly identical to those asked in 2005,[3] which were adapted from standard behaviorally based measures of these domains of IPV (Straus et al. 1996).[4]

The mental health module included the 20-item Kuwait University Anxiety Scale (KUAS; Abdel-Khalek 2000). Developed in Arabic, the scale captures current generalized anxiety. The scale has had good internal consistency (Cronbach's α = .85–.92) and adequate criterion-related, factorial, and discriminant validity in Middle Eastern and other settings (Abdel-Khalek 2000; Adbel-Khalek and Al-Damaty 2003; Abdel-Khalek and Maltby 2008; Abdel-Khalek and Rudwan 2001).

[3] Of those who received the IPV module in 2005 and were located, interviewed, and had no missing data that would exclude them from our sample (227 of 328), chance-corrected agreements for any lifetime IPV and any lifetime IPV by type by 2005 were .02–.06. Low statistics likely resulted more from higher disclosure in 2012 than recall bias. Namely, of the 102 women with discrepant responses for exposure to physical or sexual IPV before 2005, 85 reported in 2012 but not in 2005 exposure to physical or sexual IPV by 2005; comparatively, 17 reported in 2005 but not in 2012 exposure to physical or sexual IPV by 2005. Higher disclosure of IPV in 2012 likely occurred because (1) IPV-focused surveys like that in 2012 yield higher disclosure than multipurpose surveys like the 2005 EDHS (Ellsberg et al. 2001); (2) repeated interviewing enhances disclosure (Covington et al. 1997); and (3) adding more items (three more in 2012 than 2005) tends to increase disclosure (Straus and Douglas 2004).

[4] Behavioral measures of IPV may capture acts of aggression but not their severity.

Variables

Seven outcomes captured women's economic and non-economic activities from data collected in 2012. *Engagement in market work* captured whether the woman had performed any of 20 economic activities in the prior month for any return in cash or kind (Table 5 in the appendix). *Time spent on market work* was measured by summing the hours devoted in the prior month to each economic activity for which a return was reported. *Engagement in subsistence work* captured whether the woman had performed any of six economic activities in the prior month without a return in cash or kind (Table 5). *Time spent on subsistence work* was measured by summing the hours spent in the past month on reported subsistence activities. *Engagement in domestic work* captured whether the woman had performed any of seven domestic chores in the prior day (Table 5), and *time spent on domestic work* was measured by summing the minutes spent in the prior day on reported domestic activities. *Engagement in care work* captured whether the woman had performed any of six care activities in the prior day (Table 5), and *time spent on care work* was operationalized by summing the minutes spent in the prior day on reported care activities.

For exposure to IPV, we combined information from the 2012 follow-up with that from the 2005 EDHS (for 227 women with data on IPV in 2005) and created nine variables capturing lifetime IPV by type (three variables), recent IPV by type (four variables), and distal (before 2005) versus recent (after 2005) versus chronic (before and after 2005) IPV by type (two variables). For lifetime IPV by type, one variable captured whether the woman reported (1) no IPV in either survey, (2) only psychological IPV in either survey, or (3) any physical or sexual IPV in either survey. A second variable—exposure to physical or sexual lifetime IPV—compared group (3) with groups (1) and (2) combined. A third variable captured exposure to any versus no lifetime IPV.

For recent IPV by type, data came strictly from the 2012 survey. One variable captured exposure to physical or sexual IPV after 2005 (vs. no IPV, IPV only before 2005, or only psychological IPV after 2005). A second variable captured exposure to physical or sexual IPV in the prior year (vs. no IPV, IPV only before the prior year, or only psychological IPV in the prior year). A third variable captured exposure to any IPV since 2005 (vs. no IPV or IPV only before 2005), and a fourth variable captured exposure to any IPV in the prior year (vs. no IPV or IPV only before the prior year).

For distal or recent or chronic IPV by type, we used data from the 2005 EDHS and 2012 follow-up. One variable captured any physical or sexual IPV (1) before 2005 only in either survey, (2) after 2005 only, or (3) chronically before 2005 in either survey and after 2005 (vs. never physical or sexual IPV). A second variable captured exposure to any IPV (1) before 2005 only in either survey, (2) after 2005 only, or (3) chronically before 2005 in either survey and after 2005 (vs. never).

We combined data from the 2005 EDHS and the 2012 follow-up survey to form measures of lifetime IPV and of IPV before 2005 because less than one-half of the women in our sample were selected for and responded to the IPV module in 2005 (n = 227). For those who did respond, basing the measure of exposure to IPV on "yes" responses in either survey helped to correct for potential recall bias (i.e., women reported exposure to IPV in 2005 but not in 2012) and likely enhanced disclosure in 2012 (see footnote 3). This decision corresponds with the recommendations of experts to use methods to minimize underreporting of IPV (World Health Organization 2001).

To explore the mechanisms of family–work spillover, we considered poor mental health as a potential mediator of the relationship between exposure to IPV and women's work. We conducted a factor analysis of ordinal items from the KUAS, from which we generated a single score for generalized anxiety, where higher scores indicated more symptoms of anxiety. We also considered IPV-related injury as a mediator; however, women rarely reported such injury, it was rarely associated with women's work, and its inclusion did not alter coefficients for women's exposure to IPV. Therefore, we used only the measure of generalized anxiety as a mediator.

We included several covariates to control for confounding of the relationship between a woman's exposure to IPV and her engagement in various domains of work. Covariates from 2012 included the woman's age (Yount 2005; Yount and Li 2010; Zavala and Spohn 2010), reported exposure to physical violence before age 16 by someone other than her husband (e.g., Yount and Li 2010; Zavala and Spohn 2010), age at first marriage (Yount and Li 2010), whether her husband was her paternal cousin (Yount and Li 2010), whether she engaged in subsistence or market work in her first year of marriage (e.g., Kimmel 1996; Koenig et al. 2003; Krishnan et al. 2010; Rocca et al. 2009), whether a member of her natal family lived in her household or within a day's visit (Yount 2005), and the number of children younger than age 6 (Yount 2005; Yount and Li 2010).[5] Covariates from 2005 included whether the woman's husband was the head of household (a prior measure for household structure) (Yount 2005), the respondent's and her husband's completed grades of schooling (Vyas and Watts 2009; Zavala and Spohn 2010), and quartiles for household wealth based on a principal components score for household assets and amenities for the full 2005 EDHS sample (Krishnan et al. 2010; Yount 2005; Yount and Carrera 2006; Yount and Li 2010; Zavala and Spohn 2010).

Analysis

We performed univariate analyses to assess the completeness and distributions of all variables. We explored bivariate associations between the IPV-exposure variables and outcomes, and conducted the multivariate analyses in two phases. First, we used logistic regression to model the relationships between exposure to IPV and engagement in market work in the prior month, subsistence work in the prior month, and care work in the prior day. Because nearly all women (96 %) reported to have engaged in domestic work in the prior day, we did not model this association at this stage. Second, we used zero-inflated negative binomial (ZINB) regression to model the relationship between women's exposure to IPV and measures of their time spent on each type of work. ZINB regression is a suitable estimation strategy for nonnegative count data characterized by overdispersion and excessive zeros (Winkelmann 2008). Likelihood ratio tests revealed that all measures of time spent on work were overdispersed relative to a standard Poisson distribution (Dean 1992), and Vuong tests for nonnested negative-binomial (NB) and ZINB models revealed that for all measures of time, more women had spent no time on work than would be expected from standard NB models (Vuong 1989). We used the logit link to estimate the zero-inflated (ZI) portions of the distributions and NB models to estimate the count portions of the distributions.

[5] The presence of young children, more than the total number of living children, may more strongly affect women's engagement in market and care work.

All estimated models included the aforementioned covariates. To assess family–work spillover and the potential role of generalized anxiety as a mediator of the relationship between exposure to IPV and engagement in market, subsistence, and care work, we added this variable to all fully adjusted logistic and ZINB regression models. All estimates were adjusted for the complex survey design of the 2005 EDHS using the *svy* and *subpop* commands in STATA 11.1 as well as the IPV weights from the 2005 EDHS, adjusted for the increased sample size from Minya. Based on the quantitative findings, quotes from the formative qualitative data were selected to enrich interpretations in the discussion.

Several sensitivity analyses allowed us to assess the robustness of our findings. First, we tested the sensitivity of the coefficients for exposure to IPV to the inclusion or exclusion of each covariate and to alternative measurement scales for selected covariates. Second, we experimented with adding other covariates, such as measures related to matrimonial expenditures, whether the respondent was married in 2012, work before marriage, and a quadratic term for the woman's age. Finally, we reran the analyses with 227 of the 328 women who completed the IPV module in the 2005 EDHS, were found in 2012, and had complete data on outcomes, exposures, and covariates. Examining the association of reported exposure to either physical or sexual IPV in 2005 with economic and non-economic activities reported in 2012 (adjusted for work earlier in marriage and other covariates) ensured appropriate temporality of the relationships of interest.

Results

Characteristics of the Sample

On average, participants were 38.1 years old (Table 1). More than one-third reported exposure to physical violence by someone other than a spouse before age 16. Participants first married at a mean age of 17.2, often to a paternal cousin (31 %). On average, participants had completed fewer grades of schooling (2.9) than their husbands (6.1). Almost two-thirds performed market or subsistence work in their first year of marriage, and women were parenting 0–3 children under the age of 6 years. A majority were married to the head of household (83 %), were living with or (more often) within easy visiting distance to their natal family (84 %), and were living in households that fell at or below the median national score for household wealth (89 %).

Women's Engagement in Market, Subsistence, Domestic, and Care Work

Nearly all women had performed market, subsistence, domestic, or care work in 2012 (Table 1). In the prior month, 16 % had engaged in market work, and more than one-half (54 %) had engaged in subsistence work. Women, on average, devoted 5.8 hours to market work and more than 20 hours to subsistence work in that period; however, time allocated to both types of work varied widely (see Table 1). In the prior 24 hours, most women (96 %) had performed domestic work, and about one-third (30 %) had performed care work. On average, women devoted almost 270 minutes (4.5 hours) to domestic work and 30.4 minutes to care work in that period. More of women's care work time typically was devoted to their children (81 %) than to other relatives (11 %) and neighbors (8 %) (not shown).

Table 1 Descriptive statistics for covariates, economic and non-economic activities, 564 ever-married women aged 22–65 in rural Minya, Egypt

Covariates	Mean	Median	(SE)	Min.	Max.
Age, in Years[a]	38.09	37	(0.54)	22	65
Any Physical Violence by Someone Other Than Husband Before Age 16 Years[a,b]	0.37	0	(0.02)	0	1
Age at First Marriage, in Years[a]	17.20	17	(0.15)	11	28
Husband a Paternal Cousin[c]	0.31	0	(0.02)	0	1
Highest Grade Completed by Respondent[c]	2.92	0	(0.26)	0	16
Highest Grade Completed by Respondent's Husband[c]	6.07	5	(0.30)	0	20
Performed Subsistence or Market Work in Year After Marriage[a]	0.62	1	(0.03)	0	1
Number of Children Below Age 6 Years[a]	0.64	0	(0.04)	0	3
Husband the Head of Household[c]	0.83	1	(0.02)	0	1
Lives With Natal Family or Close Enough to Visit in a Day[a]	0.84	1	(0.02)	0	1
First Quartile of Household Wealth[c,d]	0.68	1	(0.03)	0	1
Second Quartile of Household Wealth[c,d]	0.21	0	(0.02)	0	1
Third Quartile of Household Wealth[c,d]	0.10	0	(0.02)	0	1
Fourth Quartile of Household Wealth[c,d]	0.01	0	(0.00)	0	1
Economic Activities[a]					
Market work					
Any, prior month	0.16	0	(0.01)	0	1
Number of activities, prior month	0.20	0	(0.02)	0	4
Hours, prior month	5.77	0	(0.62)	0	120
Subsistence work					
Any, prior month	0.54	1	(0.03)	0	1
Number of activities, prior month	0.89	1	(0.06)	0	4
Hours, prior month	20.28	7	(1.86)	0	210
Non-economic Activities[a]					
Domestic work					
Any, prior day	0.96	1	(0.01)	0	1
Number of activities, prior day	3.88	4	(0.08)	0	7
Minutes, prior day	269.77	270	(8.90)	0	765
Care work					
Any, prior day	0.30	0	(0.02)	0	1
Number of activities, prior day	0.36	0	(0.03)	0	4
Minutes, prior day	30.39	0	(3.18)	0	360

[a] From the 2012 Gender Economic Research and Policy Analysis Program follow-up survey in Minya.

[b] Slapped, kicked, anything else.

[c] From the 2005 Egypt DHS "baseline" survey in Minya.

[d] Score derived from a principal components analysis of household assets and amenities.

Women's Exposure to IPV

About two-thirds (67 %) of women reported lifetime exposure to any IPV (Table 2). Women most often reported some lifetime exposure to psychological IPV (63 %), but a majority also reported some lifetime exposure to physical or sexual IPV (54 %). Physical or sexual IPV often occurred with psychological IPV, so only 12 % of women reported lifetime exposure to psychological IPV only.

Exposure to recent IPV was common. About one-third (34 %) of women reported any IPV since their 2005 interview, with 33 % reporting exposure to psychological IPV

Table 2 Proportion of women exposed to IPV, by type, and potential mediators of exposure to IPV and women's work, 564 ever-married women aged 22–65 in rural Minya, Egypt

	Mean	Median	(SE)	Min.	Max.
Exposure to Any Lifetime IPV					
Never reported any IPV[a]	0.33	0	(0.03)	0	1
Ever reported psychological IPV only[a]	0.12	0	(0.02)	0	1
Ever reported any physical or sexual IPV[a]	0.54	1	(0.03)	0	1
Ever reported any psychological IPV[a]	0.63	1	(0.03)	0	1
Ever reported any IPV[a]	0.67	1	(0.03)	0	1
Exposure to Recent IPV					
Psychological IPV since 2005 interview[b]	0.33	0	(0.03)	0	1
Physical or sexual IPV since 2005 interview[b]	0.22	0	(0.02)	0	1
Any IPV since 2005 interview[b]	0.34	0	(0.03)	0	1
Psychological IPV in year before 2012 interview[b]	0.30	0	(0.03)	0	1
Physical or sexual IPV in year before 2012 interview[b]	0.20	0	(0.02)	0	1
Any IPV in year before 2012 interview[b]	0.32	0	(0.03)	0	1
Exposure to Distal, Recent, or Chronic IPV					
Psychological IPV before 2005 interview only[a]	0.30	0	(0.02)	0	1
Psychological IPV after 2005 interview only[b]	0.02	0	(0.01)	0	1
Psychological IPV before and after 2005 interview[a]	0.31	0	(0.03)	0	1
Physical or sexual IPV before 2005 interview only[a]	0.32	0	(0.02)	0	1
Physical or sexual IPV after 2005 interview only[b]	0.02	0	(0.01)	0	1
Physical or sexual IPV before and after 2005 interview[a]	0.20	0	(0.02)	0	1
Any IPV before 2005 interview only[a]	0.32	0	(0.02)	0	1
Any IPV after 2005 interview only[b]	0.02	0	(0.01)	0	1
Any IPV before and after 2005 interview[a]	0.32	0	(0.03)	0	1
Potential Mediators of IPV and Women's Work					
Ever reported injury as a result of IPV[a,b,c]	0.14	0	(0.01)	0	1
Factor score for symptoms of generalized anxiety[b]	0.00	–0.10	(0.06)	–2.11	2.61

[a] Based on reported exposure from the 2012 Gender Economic Research and Policy Analysis Program follow-up survey and the 2005 Egypt DHS "baseline" survey in Minya.

[b] Based on reported exposure from the 2012 Gender Economic Research and Policy Analysis Program follow-up survey in Minya.

[c] Based on 559 observations.

and 22 % reporting exposure to physical or sexual IPV in this period. Similarly, almost one-third (32 %) of women reported exposure to any IPV in the prior year, with 30 % reporting psychological IPV and 20 % reporting physical or sexual IPV in this period.

With respect to the chronicity of IPV, almost one-third of women reported distal exposure to any IPV (32 %), psychological IPV (30 %), and physical or sexual IPV (32 %). Similar percentages reported chronic exposure to any IPV (32 %) and to psychological IPV (31 %), but one in five women (20 %) reported chronic exposure to physical or sexual IPV. Two percent of women reported only recent exposure to any IPV, to psychological IPV, and to physical or sexual IPV. An estimated 14 % of women reported to have incurred some injury as a result of IPV. The mean factor score for generalized anxiety was zero but ranged from –2.1 to 2.6.

Multivariate Results

In the multivariate logistic models for market work (Table 3), women exposed to any lifetime physical or sexual IPV had marginally higher adjusted odds (aOR) than their counterparts of performing market work in the prior month (aOR = 1.57, $p < .10$, unmediated Model 2). Women exposed to recent and chronic physical or sexual IPV also had higher adjusted odds of performing market work in the prior month (Models 4, 5, and 8). For example, compared with their counterparts, women exposed to physical or sexual IPV in the prior year had marginally higher adjusted odds of performing market work in the prior month (aOR = 1.62, $p < .10$, unmediated Model 5), and these adjusted odds were slightly higher (aOR = 1.74, $p < .05$) in the anxiety-mediated model.

Few measures of IPV were associated with performing subsistence work in the prior month. Still, exposure to recent IPV was associated positively with performing such work. Compared with their counterparts, women exposed to any IPV since 2005 and to any IPV in the prior year had higher adjusted odds of performing subsistence work in the prior month (aOR = 1.82–1.87, $p < .01$, unmediated and mediated Models 6 and 7).

In models for women's care work in the prior day, exposure to lifetime IPV mattered fairly consistently. Compared with women never exposed to IPV, those ever exposed to psychological IPV only, to any physical or sexual IPV, and to any IPV had at least marginally lower adjusted odds of performing care work in the prior day (aOR = 0.39, 0.62, and 0.57, $p < .10$, respectively, unmediated Models 1 and 3). When the score for generalized anxiety was added, all these coefficients were attenuated toward 0, and the coefficients for exposure to physical or sexual IPV became nonsignificant (mediated Model 1).[6]

In the ZINB models for time spent on various domains of work (Table 4), the NB portions of these models are the count models, and coefficients here reflect the log expectation of time (hours in the prior month or minutes in the prior day) spent performing each domain of work, conditional on engaging in that work. The ZI portions of these models are logistic models, and the coefficients shown reflect the log likelihood of being a "zero" (e.g., of not engaging in market, subsistence, domestic, or care work in the given period) and thus are simply opposite in sign to the coefficients in Table 3. We, therefore, focus here on the NB results.

In the NB models for market work, the patterns of association were broadly distinguished by the type and timing of IPV. Among women who performed market work in the

[6] Results pertaining to the covariates are available upon request.

Table 3 Logistic models of the relationship between IPV and engagement in market, subsistence, and care work. 564 ever-married women aged 22–65 in rural Minya, Egypt

	Market Work (prior month)				Subsistence Work (prior month)				Care Work (prior day)			
	Unmediated		Mediated		Unmediated		Mediated		Unmediated		Mediated	
	b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
Exposure to Any Lifetime IPV												
(1) Ever psychological IPV only (ref. = never IPV)[a,b]	–0.012	(0.577)	0.092	(0.575)	0.238	(0.263)	0.208	(0.260)	**–0.930***	**(0.372)**	**–0.802***	**(0.365)**
Ever physical or sexual IPV (ref. = never IPV)[a,b]	**0.445**†	**(0.256)**	**0.532***	**(0.262)**	0.217	(0.203)	0.192	(0.212)	**–0.477**†	**(0.258)**	–0.381	(0.253)
Factor score for generalized anxiety[a,c]			**–0.267***	**(0.129)**			0.072	(0.112)			**–0.355****	**(0.100)**
(2) Ever physical or sexual IPV (ref. = never *or* psych IPV only)[a,b]	**0.448**†	**(0.229)**	**0.507***	**(0.242)**	0.147	(0.204)	0.130	(0.211)	–0.251	(0.238)	–0.185	(0.238)
Factor score for generalized anxiety[a,c]			**–0.264**†	**(0.135)**			0.082	(0.112)			**–0.384*****	**(0.102)**
(3) Ever any IPV (ref. = never IPV)[a,b]	0.367	(0.270)	**0.460**†	**(0.272)**	0.221	(0.178)	0.196	(0.185)	**–0.554***	**(0.241)**	**–0.450**†	**(0.233)**
Factor score for generalized anxiety[a,c]			**–0.271***	**(0.133)**			0.073	(0.112)			**–0.359*****	**(0.098)**
Exposure to Recent IPV												
(4) Physical or sexual IPV after 2005 (ref. = never *or* IPV only before 2005 *or* psych IPV only after 2005)[a,c]	**0.508***	**(0.220)**	**0.530***	**(0.224)**	0.376	(0.280)	0.374	(0.283)	0.024	(0.239)	0.028	(0.236)
Factor score for generalized anxiety[a]			**–0.242**†	**(0.130)**			0.089	(0.109)			**–0.394*****	**(0.107)**
(5) Physical or sexual IPV in prior year (ref. = never *or* IPV only before last year *or* psych IPV only in last year)[a]	**0.484***	**(0.218)**	**0.553***	**(0.217)**	0.339	(0.275)	0.328	(0.278)	–0.144	(0.249)	–0.084	(0.247)
Factor score for generalized anxiety[a,c]			**–0.262**†	**(0.130)**			0.082	(0.109)			**–0.391*****	**(0.106)**
(6) Any IPV after 2005 (ref. = never *or* IPV only before 2005)[a]	0.350	(0.240)	0.393	(0.241)	**0.624****	**(0.199)**	**0.615****	**(0.196)**	–0.064	(0.238)	–0.016	(0.233)
Factor score for generalized anxiety[a,c]			**–0.251**†	**(0.130)**			0.071	(0.106)			**–0.393*****	**(0.105)**
(7) Any IPV in prior year (ref. = never *or* IPV only before prior year)[a]	0.236	(0.257)	0.301	(0.255)	**0.608****	**(0.200)**	**0.597****	**(0.195)**	–0.199	(0.253)	–0.129	(0.247)
Factor score for generalized anxiety[a,c]			**–0.253**†	**(0.130)**			0.066	(0.104)			**–0.387*****	**(0.104)**

Table 3 (continued)

		Market Work (prior month)				Subsistence Work (prior month)				Care Work (prior day)			
		Unmediated		Mediated		Unmediated		Mediated		Unmediated		Mediated	
		b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
Exposure to Distal or Recent or Chronic IPV (distal and recent)													
(8)	Physical or sexual IPV before 2005 only (ref. = never physical *or* sexual IPV)[a,b]	0.314	(0.284)	0.377	(0.294)	0.012	(0.246)	–0.012	(0.257)	–0.342	(0.258)	–0.258	(0.267)
	Physical or sexual IPV after 2005 only (ref. = never physical *or* sexual IPV)[a,b]	0.967	(0.885)	0.984	(0.891)	0.393	(0.706)	0.392	(0.702)	–0.894	(0.741)	–0.909	(0.724)
	Physical or sexual IPV before and after 2005 (ref. = never physical *or* sexual IPV)[a,b]	**0.626***	**(0.263)**	**0.681***	**(0.276)**	0.380	(0.286)	0.368	(0.291)	–0.059	(0.284)	–0.014	(0.281)
	Factor score for generalized anxiety[a,c]			**–0.260†**	**(0.134)**			0.090	(0.114)			**–0.384*****	**(0.104)**
(9)	Any IPV before 2005 only (ref. = never IPV)[a,b]	0.245	(0.300)	0.337	(0.302)	–0.095	(0.216)	–0.126	(0.232)	**–0.720***	**(0.296)**	**–0.609***	**(0.296)**
	Any IPV after 2005 only (ref. = never IPV)[a,b]	1.432	(0.869)	1.478	(0.914)	0.499	(0.678)	0.488	(0.664)	–0.567	(0.718)	–0.593	(0.735)
	Any IPV before and after 2005 (ref. = never IPV)[a,b]	0.399	(0.287)	**0.497†**	**(0.293)**	**0.581***	**(0.227)**	**0.554***	**(0.228)**	–0.393	(0.265)	–0.287	(0.251)
	Factor score for generalized anxiety[a,c]			**–0.265†**	**(0.135)**			0.080	(0.114)			**–0.361*****	**(0.099)**

Notes: All models included the following covariates (bold for the 2012 Gender Economic Research and Policy Analysis Program follow-up survey, and italic for the 2005 Egypt DHS baseline survey): **Age (in years)**, **Age at first marriage (in years)**, **Number of children younger than 6 years**, *Husband head of the household* , **Performed subsistence or market work in the year after marriage**, **Lives with natal family or close enough to visit in a day**, *Husband paternal cousin*, **Experienced physical violence (i.e., slap, kick, anything else) by someone other than husband before age 16**, *Household wealth score derived from a principal components analysis of household assets, amenities*, *Highest grade completed by respondent*, and *Highest grade completed by respondent's husband*.

[a] From the 2012 Gender Economic Research and Policy Analysis Program follow-up survey in Minya.

[b] From the 2005 Egypt DHS "baseline" survey in Minya.

[c] Score derived from a factor analysis of responses to items from the Kuwait University Anxiety Scale (Abdel-Khalek 2000).

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$

Table 4 Zero-inflated negative binomial models of the relationship between IPV and time spent performing market, subsistence, domestic, and care work, 564 ever-married women aged 22–65 in rural Minya, Egypt

			Hours Engaged in Market Work (prior month)				Hours Engaged in Subsistence Work (prior month)				Minutes Engaged in Domestic Work (prior day)				Minutes Engaged in Care Work (prior day)			
			b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
Exposure to Any Lifetime IPV																		
(1)	NB	Ever psych IPV only (ref. = never IPV)[a,b]	**0.696**†	**(0.358)**	**0.671**†	**(0.345)**	0.179	(0.200)	0.156	(0.215)	–0.022	(0.077)	–0.046	(0.076)	0.028	(0.216)	–0.060	(0.201)
		Ever physical or sexual IPV (ref. = never IPV)[a,b]	–0.143	(0.152)	–0.157	(0.152)	0.043	(0.102)	0.034	(0.107)	0.079	(0.057)	0.060	(0.056)	**0.186**†	**(0.105)**	0.126	(0.110)
		Score for generalized anxiety[a,c]			0.095	(0.091)			0.057	(0.067)			**0.056***	**(0.025)**			**0.162****	**(0.052)**
	ZI	Ever psych IPV only (ref. = never IPV)[a,b]	0.015	(0.578)	–0.089	(0.575)	–0.232	(0.266)	–0.203	(0.263)	–0.192	(0.710)	–0.045	(0.741)	**0.922***	**(0.376)**	**0.798***	**(0.368)**
		Ever physical or sexual IPV (ref. = never IPV)[a,b]	**–0.447**†	**(0.256)**	**–0.534***	**(0.262)**	–0.214	(0.206)	–0.189	(0.215)	–0.355	(0.471)	–0.230	(0.499)	**0.482**†	**(0.259)**	0.390	(0.254)
		Score for generalized anxiety[a,c]			**0.268***	**(0.129)**			–0.070	(0.113)			–0.253	(0.265)			**0.336****	**(0.098)**
(2)	NB	Ever physical or sexual IPV (ref. = never *or* psych IPV only)[a,b]	**–0.322***	**(0.156)**	**–0.330***	**(0.161)**	–0.016	(0.093)	–0.017	(0.094)	0.085	(0.051)	0.073	(0.050)	**0.182**†	**(0.098)**	0.136	(0.102)
		Score for generalized anxiety[a,c]			0.109	(0.098)			0.066	(0.062)			**0.054***	**(0.025)**			**0.158****	**(0.052)**
	ZI	Ever physical or sexual IPV (ref. = never *or* psych IPV only)[a,b]	**–0.451**†	**(0.229)**	**–0.510***	**(0.242)**	–0.146	(0.206)	–0.128	(0.214)	–0.290	(0.492)	–0.214	(0.519)	0.256	(0.238)	0.195	(0.238)
		Score for generalized anxiety[a,c]			**0.265**†	**(0.135)**			–0.080	(0.114)			–0.256	(0.261)			**0.366*****	**(0.100)**

Table 4 (continued)

			Hours Engaged in Market Work (prior month)				Hours Engaged in Subsistence Work (prior month)				Minutes Engaged in Domestic Work (prior day)				Minutes Engaged in Care Work (prior day)			
			b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
(3)	NB	Ever any IPV (ref. = never IPV)[a,b]	–0.043	(0.149)	–0.056	(0.146)	0.078	(0.110)	0.064	(0.117)	0.061	(0.055)	0.041	(0.055)	0.167	(0.105)	0.105	(0.109)
		Score for generalized anxiety[a,c]			0.105	(0.095)			0.062	(0.064)			**0.055***	**(0.025)**			**0.158****	**(0.052)**
	ZI	Ever any IPV (ref. = never IPV)[a,b]	–0.368	(0.271)	**–0.461†**	**(0.272)**	–0.217	(0.181)	–0.192	(0.188)	–0.311	(0.416)	–0.183	(0.442)	**0.557***	**(0.243)**	**0.457†**	**(0.235)**
		Score for generalized anxiety[a,c]			**0.272***	**(0.133)**			–0.070	(0.114)			–0.251	(0.266)			**0.340****	**(0.096)**
Exposure to Recent IPV																		
(4)	NB	Physical or sexual IPV after 2005 (ref. = never *or* IPV only before 2005 *or* psych IPV only after 2005)[a]	0.018	(0.181)	0.039	(0.192)	–0.011	(0.124)	–0.003	(0.127)	0.047	(0.046)	0.047	(0.043)	0.094	(0.145)	0.072	(0.144)
		Score for generalized anxiety[a,c]			0.105	(0.099)			0.065	(0.063)			**0.059***	**(0.025)**			**0.173*****	**(0.048)**
	ZI	Physical or sexual IPV after 2005 (ref. = never *or* IPV only before 2005 *or* psych IPV only after 2005)[a]	**–0.508***	**(0.220)**	**–0.530***	**(0.224)**	–0.375	(0.285)	–0.373	(0.289)	–0.119	(0.516)	–0.102	(0.534)	0.011	(0.245)	0.009	(0.242)
		Score for generalized anxiety[a,c]			**0.244†**	**(0.130)**			–0.087	(0.111)			–0.273	(0.248)			**0.376*****	**(0.105)**
(5)	NB	Physical or sexual IPV in the last year (ref. = never *or* IPV only before last year *or*	0.021	(0.180)	0.017	(0.181)	0.007	(0.129)	0.004	(0.130)	0.040	(0.047)	0.033	(0.045)	0.136	(0.151)	0.071	(0.154)

Table 4 (continued)

			Hours Engaged in Market Work (prior month)				Hours Engaged in Subsistence Work (prior month)				Minutes Engaged in Domestic Work (prior day)				Minutes Engaged in Care Work (prior day)			
			b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
		psych IPV only in last year)[a]																
		Score for generalized anxiety[a,c]			0.103	(0.094)			0.066	(0.061)			**0.058***	**(0.025)**			**0.168****	**(0.052)**
	ZI	Physical or sexual IPV in the last year (ref. = never *or* IPV only before last year *or* psych IPV only in last year)[a]	**–0.484***	**(0.218)**	**–0.553***	**(0.217)**	–0.339	(0.280)	–0.327	(0.282)	–0.035	(0.518)	0.012	(0.545)	0.128	(0.250)	0.070	(0.248)
		Score for generalized anxiety[a,c]			**0.263***	**(0.130)**			–0.080	(0.110)			–0.273	(0.250)			**0.373*****	**(0.104)**
(6)	NB	Any IPV after 2005 (ref. = never *or* IPV only before 2005)[a]	0.096	(0.188)	0.103	(0.184)	0.074	(0.114)	0.072	(0.114)	**0.094***	**(0.035)**	**0.088***	**(0.035)**	0.108	(0.112)	0.066	(0.113)
		Score for generalized anxiety[a,c]			0.105	(0.095)			0.065	(0.061)			**0.057***	**(0.025)**			**0.170****	**(0.050)**
	ZI	Any IPV after 2005 (ref. = never *or* IPV only before 2005)[a]	–0.349	(0.240)	–0.392	(0.241)	**–0.626****	**(0.203)**	**–0.617****	**(0.199)**	–0.336	(0.547)	–0.297	(0.550)	0.086	(0.240)	0.041	(0.236)
		Score for generalized anxiety[a,c]			**0.253**[†]	**(0.131)**			–0.069	(0.107)			–0.266	(0.252)			**0.374*****	**(0.103)**
(7)	NB	Any IPV in the last year (ref. = never *or* IPV only before last year)[a]	0.111	(0.170)	0.102	(0.166)	0.123	(0.119)	0.117	(0.118)	**0.087***	**(0.033)**	**0.079***	**(0.033)**	0.155	(0.119)	0.090	(0.128)

Table 4 (continued)

		Hours Engaged in Market Work (prior month)				Hours Engaged in Subsistence Work (prior month)				Minutes Engaged in Domestic Work (prior day)				Minutes Engaged in Care Work (prior day)			
		b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
	Score for generalized anxiety[a,c]			0.100	(0.092)			0.062	(0.060)			**0.056***	**(0.025)**			**0.162****	**(0.054)**
ZI	Any IPV in the last year (ref. = never *or* IPV only before last year)[a]	–0.235	(0.257)	–0.300	(0.255)	**–0.609****	**(0.204)**	**–0.598****	**(0.199)**	–0.598	(0.556)	–0.566	(0.569)	0.181	(0.253)	0.114	(0.248)
	Score for generalized anxiety[a,c]			**0.254**†	**(0.130)**			–0.064	(0.106)			–0.262	(0.251)			**0.370*****	**(0.102)**
Exposure to Distal *or* Recent *or* Chronic IPV (distal and recent)																	
(8) NB	Physical or sexual IPV before 2005 only (ref. = never physical *or* sexual IPV)[a,b]	**–0.521****	**(0.178)**	**–0.556****	**(0.187)**	–0.018	(0.126)	–0.023	(0.129)	0.086	(0.062)	0.070	(0.061)	0.205	(0.140)	0.152	(0.145)
	Physical or sexual IPV after 2005 only (ref. = never physical *or* sexual IPV)[a,b]	–0.137	(0.267)	0.005	(0.336)	**–0.589***	**(0.259)**	**–0.589***	**(0.275)**	–0.098	(0.136)	–0.093	(0.143)	0.216	(0.264)	0.243	(0.246)
	Physical or sexual IPV before and after 2005 (ref. = never physical *or* sexual IPV)[a,b]	–0.155	(0.189)	–0.156	(0.191)	0.012	(0.114)	0.017	(0.116)	**0.099**†	**(0.057)**	**0.091**†	**(0.054)**	0.149	(0.148)	0.107	(0.149)
	Score for generalized anxiety[a,c]			0.139	(0.107)			0.067	(0.062)			**0.054***	**(0.025)**			**0.159****	**(0.054)**
ZI	Physical or sexual IPV before 2005 only (ref. =	–0.319	(0.284)	–0.382	(0.294)	–0.011	(0.249)	0.013	(0.261)	–0.297	(0.529)	–0.217	(0.553)	0.330	(0.257)	0.250	(0.265)

Table 4 (continued)

		Hours Engaged in Market Work (prior month)				Hours Engaged in Subsistence Work (prior month)				Minutes Engaged in Domestic Work (prior day)				Minutes Engaged in Care Work (prior day)			
		b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
	never physical *or* sexual IPV)[a,b]																
	Physical or sexual IPV after 2005 only (ref. = never physical *or* sexual IPV)[a,b]	–0.968	(0.885)	–0.985	(0.891)	–0.438	(0.731)	–0.439	(0.728)	**–14.563*** **	**(0.816)**	**–14.215*** **	**(0.853)**	0.884	(0.748)	0.896	(0.731)
	Physical or sexual IPV before and after 2005 (ref. = never physical *or* sexual IPV)[a,b]	**–0.627***	**(0.262)**	**–0.682***	**(0.276)**	–0.378	(0.291)	–0.365	(0.296)	–0.229	(0.582)	–0.167	(0.616)	0.092	(0.290)	0.051	(0.287)
	Score for generalized anxiety[a,c]			**0.262**†	**(0.135)**			–0.088	(0.116)			–0.259	(0.259)			**0.366*** **	**(0.102)**
(9)	**NB** Any IPV before 2005 only (ref. = never IPV)[a,b]	–0.107	(0.182)	–0.133	(0.185)	0.051	(0.134)	0.035	(0.144)	0.018	(0.070)	–0.005	(0.070)	0.168	(0.156)	0.105	(0.162)
	Any IPV after 2005 only (ref. = never IPV)[a,b]	**0.707***	**(0.346)**	**0.777***	**(0.293)**	0.065	(0.337)	0.059	(0.337)	0.082	(0.079)	0.080	(0.087)	0.164	(0.234)	0.169	(0.215)
	Any IPV before and after 2005 (ref. = never IPV)[a,b]	–0.038	(0.186)	–0.060	(0.176)	0.103	(0.127)	0.092	(0.131)	**0.104**†	**(0.052)**	0.085	(0.052)	0.166	(0.118)	0.100	(0.123)
	Score for generalized anxiety[a,c]			0.147	(0.101)			0.063	(0.065)			**0.057***	**(0.025)**			**0.159** **	**(0.053)**
	ZI Any IPV before 2005 only (ref. = never IPV)[a,b]	–0.246	(0.301)	–0.339	(0.303)	0.100	(0.219)	0.131	(0.236)	–0.236	(0.528)	–0.113	(0.547)	**0.707***	**(0.295)**	**0.601***	**(0.295)**

Table 4 (continued)

	Hours Engaged in Market Work (prior month)				Hours Engaged in Subsistence Work (prior month)				Minutes Engaged in Domestic Work (prior day)				Minutes Engaged in Care Work (prior day)			
	b	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)	*b*	(SE)
Any IPV after 2005 only (ref. = never IPV)[a,b]	–1.429	(0.869)	–1.475	(0.914)	–0.504	(0.692)	–0.493	(0.678)	**–16.612*** **	**(0.869)**	**–16.396*** **	**(0.786)**	0.569	(0.726)	0.592	(0.740)
Any IPV before and after 2005 (ref. = never IPV)[a,b]	–0.400	(0.287)	**–0.498**†	**(0.293)**	**–0.580***	**(0.231)**	**–0.553***	**(0.231)**	–0.369	(0.479)	–0.281	(0.498)	0.410	(0.269)	0.309	(0.256)
Score for generalized anxiety[a,c]			0.266†	(0.135)			–0.078	(0.115)			–0.242	(0.270)			**0.342****	**(0.097)**

Notes: NB refers to negative binomial and ZI refers to zero-inflated. All models included the following covariates (bold for the 2012 GERPA follow-up survey and italic for the 2005 Egypt DHS baseline survey): **Age (in years)**, **Age at first marriage (in years)**, **Number of children younger than 6 years**, *Husband head of the household*, **Performed subsistence or market work in the year after marriage**, **Lives with natal family or close enough to visit in a day**, *Husband paternal cousin*, **Experienced physical violence (i.e., slap, kick, anything else) by someone other than husband before age 16**, *Household wealth score derived from a principal components analysis of household assets/amenities*, *Highest grade completed by respondent*, and *Highest grade completed by respondent's husband*.

[a] From the 2012 Gender Economic Research and Policy Analysis Program follow-up survey in Minya.

[b] From the 2005 Egypt DHS "baseline" survey in Minya.

[c] Score derived from a factor analysis of responses to items from the Kuwait University Anxiety Scale (Abdel-Khalek 2000).

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$

prior month, those exposed to psychological IPV only and to more recent IPV of any type spent marginally more time on this work than did unexposed women (β = 0.696 for psychological IPV, $p < .10$, unmediated Model 1; β = 0.707 for any type of more recent IPV, $p < .05$, unmediated Model 1). Yet, those exposed to any lifetime and to distal physical or sexual IPV spent less time on market work than their counterparts (e.g., β = –0.322, $p < .05$, unmediated Model 2; β = –0.521, $p < .01$, unmediated Model 8). The score for generalized anxiety was not significantly associated with time spent on market work, and adding the score as a mediator did not markedly alter the associations between some measures for prior IPV and time spent on market work (e.g., β = –0.330 for lifetime physical or sexual IPV, $p < .05$; β = –0.556 for distal physical or sexual IPV, $p < .01$, mediated Models 2 and 8, respectively).

In NB models for subsistence work, only exposure to more recent physical or sexual IPV (after 2005) was associated with time spent on subsistence work, but this result should be considered with caution given that few women reported exposure to physical or sexual violence after 2005 only ($n = 10$).

In NB models for domestic work, more recent as well as chronic IPV were associated with more time spent on domestic work in the prior day, and women's generalized anxiety modestly mediated some of these relationships. Women exposed to any IPV since 2005 and in the past year spent more time on domestic work in the prior day (respectively, β = 0.094 and β = 0.087, $p < .05$, unmediated Models 6 and 7), and these relationships remained significant in the anxiety-mediated models. Chronic exposure to physical or sexual IPV and to any IPV were associated with spending more time on domestic work in the prior day (respectively, β = 0.099 and β = 0.104, $p < .10$, unmediated Models 8 and 9), and adding the score for anxiety did not much alter these associations, although the result for chronic exposure to any IPV was no longer significant.

The results for time spent on care work showed few associations of IPV with this outcome. Among women performing care work, those ever exposed to physical or sexual IPV spent marginally more time on this work than their counterparts (β = 0.182, $p < .10$, unmediated Model 2), and this association was attenuated and became nonsignificant in the anxiety-mediated model.[7]

Sensitivity Analyses

Alternative Model Specifications, With and Without Covariates

To test the robustness of the findings in Tables 3 and 4, we reran the analyses, systematically removing each included covariate and adding other potential covariates. Overall, the estimated coefficients for exposure to IPV were robust to these alternative specifications (results available upon request). In some cases, adding other covariates resulted in identifying some significant associations between the added covariate and a domain of women's work (e.g., total spending on marriage with performing market and care work as well as time spent on care work). In general, these additional covariates were not significant across all models, and their inclusion did not alter the estimates for exposure to IPV. Exceptionally, adding a control for total spending on marriage

[7] Results pertaining to the covariates are available upon request.

strengthened the positive relationship between exposure to any chronic, recent, or lifetime IPV and time spent on care work in the prior day, and these relationships became statistically significant at $p < .05$.

Replacing the covariate for women's economic activity (subsistence or market work) in the year after marriage with the covariate for their economic activity in the year before marriage and excluding women's prior economic activity entirely from the models resulted in stronger estimated associations between exposure to IPV and women's engagement in and time spent on market and subsistence work in the prior month. We retained economic activity in the year after marriage as a covariate because it was more strongly associated with women's recent work than was their economic activity in the year before marriage, and it helped to control for the reciprocal influences of women's economic activities on their risks of exposure to IPV (e.g., Vyas and Watts 2009).

Restricting the Panel to Women Who Reported on IPV in 2005

As a final sensitivity analysis, we restricted our sample to the 227 women who were selected for and responded to questions about IPV in 2005, were reinterviewed in 2012, and had complete data for variables of interest. Perhaps because of the small sample for analysis ($n = 227$) and likely underreporting of exposure to IPV in 2005, there were no significant associations between reported physical or sexual IPV in 2005 and reported work in 2012 (results available upon request).

Discussion

In this analysis, we tested spillover, compensation, and patriarchal bargaining theories to explain the influences of women's exposure to IPV with their economic and non-economic activities in Minya, Egypt. Prior studies conducted mainly in the United States have relied on small purposive samples of low-income women and have focused on market and care work (Swanberg et al. 2005), with unclear applicability to non-Western settings. Scant research in non-Western settings has focused on earnings and market work using data in which women's economic activities are likely underreported (Langsten and Salem 2008). Thus, studies of how women's exposure to IPV may influence the full range of their economic and non-economic activities are lacking for lower-income settings outside the West.

The analysis outlined in this article benefited from multiple innovations in study design. First, we accounted for women's market and subsistence work in 2012 using a detailed activities list adapted from prior studies in Egypt (Langsten and Salem 2008) and for women's domestic and care work by adding contextually relevant activities from formative qualitative research. As a result, we were able to measure women's engagement in and time spent on market, subsistence, domestic, and care work more accurately than other standard surveys have done previously in poorer settings. Second, we made substantial efforts to control for women's earlier market and subsistence work by asking retrospective questions in 2012 about engagement in such work just before and after marriage. Third, we extended data on exposure to psychological, physical, and sexual IPV from the 2005 EDHS by asking in 2012 about exposure to such

violence since 2005 and in the prior year.[8] These innovations allowed us to estimate how women's exposure to distal, recent, and chronic IPV by type may be associated with their recent economic and non-economic activities in a probability sample of rural women in a poorer setting, adjusting for major sources of confounding.

Our results show that women in rural Minya engage at high rates in economic activities, with 16 % engaged in market work and 54% engaged in subsistence work in the prior month, estimates that far exceed those for rural Upper Egypt from the 2005 EDHS (16 % economically active in the prior year) (El-Zanaty and Way 2006). Domestic work also was almost universal, and about one-third of women reported care work in the prior day, resulting in a mean of 5 hours spent on these activities in the prior 24 hours. Thus, overall, women in rural Minya are heavily engaged in economic and non-economic activities, and this work is not fully documented in standard surveys.

Our results also revealed high levels of lifetime and chronic exposure to any IPV (67 % ever exposed, 32 % exposed before and after the 2005 interview). Although this sample of women differed in age from those often included in cross-sectional studies of IPV, our estimates of lifetime exposure to any IPV far exceeded those for rural Southern Egypt (35 %) from the 2005 EDHS (El-Zanaty and Way 2006). Moreover, for the subsample of women who were asked about IPV in 2005 and 2012, our estimates of any lifetime IPV for the period before the 2005 interview (66 %) exceeded those from the 2005 EDHS. Women's greater disclosure in 2012 than in 2005 of lifetime IPV up to 2005 most likely resulted from the 2012 survey's (1) focus on IPV, (2) repeated interviewing of those women who received an IPV module in 2005, (3) extensive probing to place episodes of IPV in chronological time, and (4) additional items on IPV, all of which are known to increase disclosure.

Based on the multivariate findings, a synthesis of spillover, compensation, and patriarchal bargaining appear to explain women's work-related responses to IPV in this setting. Figure 2 summarizes the findings with respect to each theory, and the shaded findings highlight dominant patterns of association. Corroborating compensation theory, exposures to lifetime, recent, and chronic physical or sexual IPV were associated with higher adjusted odds of performing market work in the prior month, and exposures to recent and chronic IPV were associated with higher adjusted odds of performing subsistence work in the same period. Corroborating compensation and patriarchal bargaining theories, women exposed to lifetime, recent, and chronic IPV spent more time on domestic work than unexposed women. Finally, corroborating spillover and patriarchal bargaining theories, exposures to lifetime IPV of all forms were associated with lower adjusted odds of performing (mostly child-related) care work in the prior day.

To test theories of family–work spillover further, we estimated mediated models in which a score for generalized anxiety was added to adjusted models for engagement in and time spent on each domain of work. Mixed associations of this score with domains of women's work and often negligible changes in the coefficients for IPV across unmediated and mediated models suggested that spillover onto women's mental health did not explain women's work-related responses to IPV. Yet, corroborating family–work spillover, the score for women's generalized anxiety was negatively associated with their

[8] We also asked about IPV before 2005 for the 2005 EDHS sample that did not receive the IPV module in 2005.

	Market Work (prior month)			Subsistence Work (prior month)			Domestic Work (prior day)			Care Work (prior day)		
	Model	Exposure	Results	Model	Exposure	Results	Model	Exposure	Results	Model	Exposure	Results
Family–Work Spillover	NB-U,M	LPS	–,–	NB-U,M	R1PS	–,–				LO-U,M	LPSY	–,–
	NB-U,M	DPS	–,–							LO-U	LPS	(–)*
										LO-U,M	LANY	–,(–)*
							[see figure notes below]			LO-U,M	DANY	–,–
Compensation	LO-U,M	LPS	(+),+	LO-U,M	R1ANY	+,+	NB-U,M	R1ANY	+,+	NB-U	LPS	(+)*
	LO-U,M	LPS	(+),+	LO-U,M	R2ANY	+,+	NB-U,M	R2ANY	+,+	NB-U	LPS	(+)*
	LO-U,M	R1PS	+,+	LO-U,M	CANY	+,+	NB-U,M	CPS	(+),(+)			
	LO-U,M	R2PS	+,+				NB-U	CANY	(+)*			
	LO-U,M	CPS	+,+									
	NB-U,M	LPSY	(+),(+)									
	NB-U,M	R1ANY	+,+									
Patriarchal Bargaining							NB-U,M	R1ANY	+,+	LO-U,M	LPSY	–,–
							NB-U,M	R2ANY	+,+	LO-U	LPS	(–)*
							NB-U,M	CPS	(+),(+)	LO-U	LANY	–,(–)*
							NB-U	CANY	(+)*	LO-U,M	DANY	–,–

Fig. 2 Summary of findings with respect to three theoretical perspectives and associated hypotheses concerning the influence of women's exposure to intimate partner violence on engagement and time spent on their economic and non-economic activities. **Notation used for Model columns is as follows:** NB = negative binomial regression model for time spent on given work, among those performing given work; LO = logistic regression model for any engagement in given work in specified period of time; U = adjusted model with all covariates in Table 2, without generalized anxiety as a potential mediator; and M = adjusted model with all covariates in Table 2, with generalized anxiety as a potential mediator. **Notation used for Exposure columns is as follows:** PS = physical or sexual IPV; PSY = psychological IPV; ANY = any IPV; L = ever in the woman's lifetime; R1 = recent, since 2005; R2 = recent, in the prior year; C = chronic, before and after 2005; and D = distal, before 2005. **Notation used for Results columns is as follows:** – denotes a significantly negative association ($p < .05$), (–) denotes a marginally significant negative association ($p < .10$), + denotes a significantly positive association ($p < .05$), (+) denotes a marginally significant positive association ($p < .10$), and * denotes possible mediation of generalized anxiety because unmediated coefficients for IPV are attenuated in mediated model and become less significant or nonsignificant. Nonsignificant coefficients for IPV are not presented. **Other notes:** The score for generalized anxiety was negatively associated with engagement in market and care work and positively associated with time spent on domestic and care work, but not associated with either engagement in or time spent on market work and subsistence work. The estimates for R1PS and R1ANY in inflate portions of Models 8 and 9 of Table 4 were large and significantly negative, but they may be unstable because of invariance of the outcome

engagement in care work, and the associations of exposure to IPV with engagement in care work and time spent on domestic and care work often were attenuated when this score was added to the models (Fig. 2).

Thus, a synthesis of spillover, compensation, and patriarchal bargaining theories may best explain women's work-related responses to IPV in rural Minya. Exposed women may "bargain with patriarchy" by spending more time on domestic work, attempting to fulfill local norms of the good wife role to oblige their husband morally to use self-restraint (Yount 2011). In an in-depth interview from this study, one woman explained how caring for her child competed with tending to her husband's needs, and how she escalated her domestic work to pacify her husband's violent response:

> [My husband] was back earlier than his usual time . . . the child was crying and I wasn't able to prepare the food. . . . When he did not find his food ready, he was angry. . . . He cursed me. . . . I aimed to prepare things early since then. (37 years old, technical vocational secondary certificate, married 18 years, previously performed market work, performs subsistence, domestic, and care work)

Simultaneously, women may compensate for marital violence by substituting economic activities for non-economic care work to enhance their economic independence. Some informants clarified, however, that their husbands restricted their access to certain types of market work that might involve, for example, interactions with men, a greater distance to travel, or even exposure outside the home. One woman explained that home-based market work was the only type that her husband permitted: "I wanted to work in a company because I am educated . . . but he refused." (32 years old, vocational secondary schooling, married 15 years, raises birds that others sell in the market).

As a result, women exposed to IPV may opt for less visible strategies to enhance their economic security. One informant, for example, admitted to forming an informal savings club and to saving money "behind her husband's back" (37 years old, technical vocational secondary certificate, married 18 years, previously performed market work, performs subsistence, domestic, and care work). In this way, a combination of patriarchal bargaining through escalated domestic work, compensatory engagement in perhaps nonwage-based economic activities, and adverse spillover effects on engagement in care work (mostly with children) may best describe women's strategic responses especially to recent and chronic IPV in this setting.

Although our study fills important gaps in research, our findings have some notable limitations. First, the findings are generalizable only to rural Minya, and their wider generalizability should be assessed by replicating this study in urban Minya, other Egyptian governorates, and other poor settings where women's nonwage market and subsistence work are common. Second, we were unable to leverage the panel data for our main analyses because of the small number of women in our sample (227 of 564) who received the IPV module in 2005 and the likely substantial underreporting of IPV in 2005. As a result, we interpret our findings as associational, noting our careful use of (1) controls for women's engagement in economic activities in early marriage and (2) respondents' retrospective reports to establish an appropriate temporal ordering between women's prior exposure to IPV and their recent engagement in various types of work. Still, longitudinal studies are needed to control for potential reciprocal causation between these constructs, and randomized interventions to reduce the risk of IPV would aid further in isolating its causal effects on women's work. Third, our findings provide indirect evidence of adverse effects of women's exposure to IPV on parenting. Research in the United States has shown negative effects of IPV on parenting and child outcomes (e.g., Erel and Burman 1995; Krishnakumar and Buehler 2000), but this research is nascent in poorer settings (see Misch and Yount 2013; Yount et al. 2011; Zureick-Brown et al. 2013). Thus, research in poorer settings should explore the full range of potential spillover effects of women's exposure to IPV on their parenting and child outcomes.

Finally, our findings expose considerable gaps in support for women exposed to IPV in settings like Minya. Programs to strengthen occupational skills and women-controlled savings programs would enhance women's economic independence from violent partners. Such programs should be combined with trusted, affordable, and culturally acceptable child care to avoid adverse spillover on the important care work that women perform.

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Appendix

Table 5 Women's market and subsistence activities and domestic and care activities from the 2012 follow-up survey

Women's Market and Subsistence Activities (prior month)	Women's Domestic, Care, and Other Activities (prior day)
Anything in the fields, such as harvesting, cutting clover, watering plants?[a]	Prepared food or meals for your family?[b]
Raised livestock, or sold livestock or milk?[a]	Cleaned up after family meal?[b]
Raised or kept birds or poultry, or sold birds or eggs?[a]	Cleaned your house?[b]
Sewing or embroidery (or similar)?[a]	Washed clothes for your family?[b]
Made sweets, koshari, tamaia, feteer (or similar)?	Went shopping for food or other needs for your family?[b]
Prepared vegetables (or similar)?	Did repair work on your home?[b]
Made butter, ghee, cheese (or similar)?[a]	Cleaned the livestock or poultry's pen?[b]
Sold something (else) in the market?	Obtained health care for your children?[c]
Sold something (else) from home?	Helped one of your children with schoolwork?[c]
Did construction work, such as carried cement, bricks, or sand?[a]	Provided other care for your children?[c]
Worked in someone else's home?	Obtained health care for another relative?[c]
Did anything else similar?	Provided any other care for another relative?[c]
Sold something (else) in a shop?	Traveled for any care-related activities?
Worked in an office or school?	Volunteered for an organization?
Worked in a hospital or clinic?	Provided any assistance to a neighbor?[c]
Worked in a bank?	Visited with friends or relatives?
Worked in a government office or in the public sector?	Other (specify)
Worked in a restaurant or hotel?	
Worked in a factory or workshop?	
Did anything else similar?	

[a] Items included in the measures for subsistence work.

[b] Items included in the measures for domestic work.

[c] Items included in the measures for care work.

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