

Women's empowerment in Egypt: the reliability of a complex construct

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Abstract: *Women's empowerment, defined as the process where women acquire enabling resources that enhance their agency, is a strategy employed to improve women's reproductive health. Agency is conceptualised as the ability to define life choices. However, measures of women's agency, such as household decision-making, are thought to be unreliable. Null and negative associations between women's empowerment and reproductive health are often attributed to weak measures of empowerment that are perceived to lack validity and reliability. This study uses the 2006 and 2012 Egyptian Labor Market Panel Survey and the 2008 and 2014 Egyptian Demographic and Health Survey to examine the reliability of measures of women's agency by considering the effects of women's individual and household characteristics on women's agency. Both surveys are nationally representative, from similar time periods and include the same measures of agency – household decision-making and attitudes towards intimate partner violence (IPV). Negative binomial regression models of individual and household determinants of agency demonstrate the degree to which the measures secure consistent results upon repeated application. Results show that the same individual, household, and spousal characteristics were consistently associated with decision-making and attitudes towards IPV in the two surveys. Findings support the conceptualisation of women's empowerment as household decision-making and attitudes towards IPV in Egypt. This also offers promising evidence for use of these measures in reproductive health research, in women's health programmes, and as part of strategies to improve women's empowerment. DOI: 10.1080/26410397.2019.1586816*

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Introduction

Women's empowerment is a consistent focus of global development efforts and an established dimension of women's health.¹ Empowered women are more likely to use modern contraception, have lower fertility, have access to antenatal care, have positive mental health, and to provide their children with appropriate nutrition.^{2–7} However, the volume of research on women's empowerment and health shows the two may be unrelated or positively or negatively related, depending on the context and the type and level of empowerment measure (e.g. individual vs. community).^{2,8} Null and negative associations between empowerment and health are often attributed to the abstract nature of defining empowerment, poor theoretical framing, and weak measures of

empowerment perceived to lack validity and reliability.⁹

Women's *empowerment* is the process in which women acquire enabling resources, like education, which may enhance women's *agency*, or the ability to define life choices in an evolving social context.¹⁰ Agency includes the ability to control resources, formulate one's own strategic choices, and to make attitudinal changes under evolving constraints, reflecting women's self-perception of the ability to actualise goals.^{11–13} While there are several terms related to agency, including women's status, gender equality and women's autonomy, agency is central to the definition of women's empowerment. Agency is also a context-specific, multidimensional construct, operating at individual and collective levels with application to

societies, like Egypt, where women's interpersonal and social relationships are integral to their identities.^{12,14,15} Agency can include intrinsic, attitudinal measures like support of egalitarian gender norms or instrumental measures like greater participation in household decision-making.¹⁶

In Egypt, improving women's empowerment and agency is an ongoing effort. In the 2018 Global Gender Gap report issued by the World Economic Forum, Egypt ranks 135th out of 149 countries. While recent efforts have validated measures of agency in the Egyptian context,^{12,17} and a few studies point to the measurement of empowerment as a latent variable,^{18,19} little is known about whether measures of agency, like household decision-making, are reliable in Egypt. Validity cannot exist without reliability; nonetheless independent assessments of reliability are important. A measure is said to have high reliability if it produces similar results under consistent conditions. Measurement reliability is not just the property of an instrument. Rather, a measure or instrument has a certain degree of reliability when applied to certain populations under certain conditions.

To date, no studies consider the reliability of measures of women's agency commonly used in women's health, gender-based violence and fertility research. By exploring whether the same characteristics of women's lives are associated with empowerment in multiple survey research samples, empowerment can be better understood, contextualised, and measured. This study uses the 2006 and 2012 Egyptian Labor Market Panel Survey and the 2008 and 2014 Egyptian Demographic and Health Survey to examine the reliability of measures of women's agency and the extent to which measures of agency secure consistent results upon repeated application in Egypt.

Background

Measures of agency

The literature includes a wide array of measures of women's empowerment and agency.⁸ With origins in theoretical work in social demography,^{20,21} survey indicators were developed to measure multidimensional aspects of women's agency, including household decision-making, freedom of movement, and freedom from domestic violence.^{21,22} These indicators formed the basis of the empowerment questions in the Demographic and Health Surveys (DHS), the most commonly used source for data on women's empowerment and health.

Some studies aggregate these measures of empowerment, which is problematic because indices mask differential contributions of certain measures and dimensions.^{2,18,19} Research shows that the best fitting models of empowerment across a variety of contexts consist of distinct, and at times correlated functional dimensions of access to information, household decision-making, financial autonomy, justification for spousal abuse, ability to refuse sex, and attitudes and exposure to intimate partner violence (IPV).^{18,19,23,24}

Household decision-making, one of the first measures of women's agency, has origins in survey research in south Asia.^{9,11} Female respondents are asked a set of questions about who in their household makes decisions about a series of household tasks. This measure is intended to capture instrumental agency or power within households, whether women have a say in decisions, and who is making different types of decisions in the household.²⁵ Although the majority of the research utilising the measure is cross sectional, household decision-making is the most common measure of empowerment used in research on reproductive health.^{2,8,26,27}

Studies demonstrate the validity of household decision-making in Egypt, meaning it measures women's agency as it is intended to measure it in that context.¹² The structure of agency scales that include decision-making are invariant across time in Egypt.¹⁷ Household decision-making has been linked to several outcomes in Egypt, including generalised anxiety, contraceptive use, fertility, and infant survival.^{6,7,28,29} The validity of household decision-making and its connection to multiple women's health outcomes in Egypt demonstrate its importance as a measure of women's agency in Egypt. Yet the reliability of household decision-making or its ability to produce similar results under consistent conditions in Egypt remains unknown.

Several intrinsic measures like attitudes towards gender norms and tolerance of IPV are also commonly used as measures of women's empowerment globally,^{8,30,31} and in Egypt specifically.^{13,17,28,32–34} Attitudes towards gender norms is a scale comprised of questions about whether or not women believe women should do certain things, like employment, and be treated the same as men, like equal pay. Acceptance of IPV is a series of questions about under what circumstances a woman thinks IPV is acceptable.³⁵ Attitudinal measures of IPV are also highly

associated with the incidence of IPV against women.^{34,36} Anywhere between 28% and 62% of women in Egypt report experiencing IPV, but most estimates are closer to 30%.³⁷ These intrinsic measures of agency are also the only measures of agency that are negatively associated with fertility longitudinally²⁸ and with family planning across contexts.³¹

Determining reliability of women's agency

External reliability is the degree to which data measured at one time is consistent with data from the same variable measured at another time. Instrumental measures of agency like decision-making and intrinsic measures like tolerance of IPV are thought to be fraught with unsystematic threats to reliability. Unsystematic threats to reliability include instrument reliability – the research instrument or measurement approach itself (e.g. poorly worded questions, quirk in mechanical device); subject reliability – factors that have to do with the research subject like fatigue; observer reliability – factors related to the interviewer or observer; and data processing reliability – the way the data are handled or coded. Household decision-making is thought to be prone to both subject reliability and data processing reliability issues. Respondents may change their mind or vary in their responses about who makes what household decision and data on household decisions is coded in a wide variety of ways (e.g. individual items, a scale, a count, etc.); thus, repeated applications of the measure could be inconsistent in capturing household dynamics.

To test for these unsystematic threats and establish reliability of instrumental and intrinsic measures of agency, the same characteristics of women's lives should affect women's agency at the same points in time. In Egypt, as in other contexts, women's agency is likely to be affected by individual, family, community, and macro political and social factors.⁹ Egypt is traditionally patriarchal, and women face inequalities across policy and community sectors as well as in the household. While there are many factors that can shape women's agency, studies demonstrate that individual characteristics like age, marital status, women's age at marriage, education, and employment are important determinants of agency.^{38–42} Education and employment give women a greater sense of personal control. In Egypt, later age at marriage provides more opportunity for education, employment, and participation in the

choice of a husband, which can enhance women's negotiating power within the households.¹³ Research in Egypt also shows that household factors like size and wealth as well as the region and community where the household is located shape women's agency.^{41,43} Overall, research on longitudinal determinants of women's empowerment in Egypt demonstrates that these factors shape married women's agency: age at marriage, educational attainment, and work experience, characteristics of the husband like age and education, and household characteristics (including regional location).⁴¹

Using two nationally representative surveys from similar points in time (2006 and 2008 and 2012 and 2014), this study focuses on testing the reliability of women's agency in Egypt by considering the effects of women's individual and household characteristics on women's decision-making and attitudes towards IPV. Measurement reliability can be demonstrated through application of measures to specific populations under specific conditions. Individual and household characteristics that have been found to be associated with women's agency should demonstrate consistent relationships with women's agency across survey samples from Egypt. The two-year time frames in this study are short enough so that the construct of empowerment should not change. The hypothesis for the study includes that characteristics of women's lives will have the same associations with women's agency across samples, and thus, household decision-making and attitudes towards IPV will be reliable measures of women's agency for the Egyptian context.

Methods

Data

The Egyptian Labor Market Panel Survey (ELMPS) is a nationally representative panel survey of households in Egypt. Data were collected in 2006 and 2012 by the Economic Research Forum. The data include socioeconomic attributes of households and a large nationally representative sample of ever-married women. The ELMPS data contains individual-level information about education, age, gender, and many other demographic variables as well as household-level information about assets and consumption and location. The ELMPS measures of agency include: (a) questions on participation in household decision-making, (b) questions about a woman's tolerance of IPV.

All data were self-reported during a face-to-face interview conducted by a trained field interviewer.⁴⁴ The analytic samples are restricted to women in their childbearing years that are currently married. Of the 37,140 individuals in 2006, 49% or 18,555 are women, 9937 are between the ages of 15 and 49, and 5798 are married with complete data on all independent measures and spouses. These 5798 married women, aged 15–49, with data on spouses comprise the 2006 analytic sample. The 2012 ELMPs sample comprised in the same way includes 9030 married women.

Data also come from the latest two rounds of Demographic and Health Surveys conducted in Egypt (EDHS) – 2008 and 2014. THE EDHS uses a multistage stratified probability-based sample. The EDHS samples were drawn from updated versions of the census frame using a three-stage cluster design in rural and urban areas. A woman's form was administered to all ever-married women aged 15–49 and gathered data on demographics, reproductive history, and health knowledge and practices. The response rate is 99.7%.⁴⁵ The EDHS analytic samples include nationally representative samples of married women aged 15–49 with complete information on all independent measures and measures of women's agency (2008: $N = 13,801$ and 2014: $N = 18,172$).

Measures

Agency

Women's agency was measured on the individual level and across several dimensions: *individual household decision-making*, *joint household decision-making*, and *attitudes towards intimate partner violence*. Respondents were asked to state who in the family (the respondent alone, husband, respondent and husband jointly, somebody else, or others) had final say on a series of household decisions. Two count variables capture household decision-making: a count of the number of times the respondent herself makes decisions, *individual household decision-making*, and a count of the number of times the respondent and husband within the household participate in decisions, *joint household decision-making*. Counts range from zero to four with a higher count indicating more participation on a greater number of household decisions. In both the ELMPs and the EDHS, the survey questions were the same and as such, the measures were operationalised in the same way.

Attitudes towards intimate partner violence

This is a five-item scale assessing a level of acceptance of domestic violence. Respondents were asked if a husband is justified in beating his wife if (a) she burns the food, (b) she neglects the children, (c) she argues with him, or (d) she refuses him sex. Yes or no responses were summed to create a scale that ranges from zero to four with higher responses indicating a greater belief in domestic violence. The internal reliability coefficients are 0.86 for the EDHS and 0.84 for the ELMPs implying a reasonable to high level of correlation among the items. IPV attitudes were not measured in the 2012 ELMPs and are therefore not reported for either the 2012 ELMPs or the 2014 EDHS.

Independent variables

The models include individual-level variables that have been identified in the literature as potential determinants of women's agency: age, education, and employment. Women's age and age at marriage are measured in years. Education is also defined as years completed. Having ever been employed is a dichotomous variable indicating whether or not a woman has ever worked for pay. Age at marriage is dichotomised to indicate whether the respondent was married before or at 18 years or older.

Also included are variables related to the women's households like size, region of residence, and wealth as well as husbands' characteristics including age and education. Household size is a continuous measure based on the number of inhabitants in a household. Region is coded "0 = greater Cairo, Alexandria, and Suez", "1 = Urban Lower Egypt", "2 = Rural Lower Egypt", "3 = Urban Upper Egypt", and "4 = Rural Upper Egypt". The household wealth index is estimated from asset variables using principal components analysis by the survey designers. Assets include ownership of items like a TV or car and characteristics of housing like roofing. The household wealth index is divided into quintiles: poorest, poor, middle, rich, and richest for use in DHS and ELMPs analyses. Spouse's age and education are coded in the same manner as the women's individual characteristics.

Analytic strategy

Descriptive statistics and frequency distributions of the independent and dependent variables for married women in both survey samples were

examined. Bivariate associations between all variables were estimated and revealed no concerns for collinearity among the covariates. Then, as each of the agency outcomes is a count, negative binomial regression models of women's agency were estimated for each outcome – *individual and joint household decision-making* and *intimate partner violence attitudes* – for each survey. Due to over-dispersion in decision-making, tests of model fit favoured negative binomial regression models, which allow for the variance to be greater than the mean. Sensitivity analyses of zero-inflated Poisson models produced similar results. Multivariate models include women's individual characteristics, household characteristics, and spousal characteristics that are known determinants of agency in other contexts. The multivariate models for the 2008 EDHS are compared to the 2006 ELMPs and the multivariate models for the 2014 EDHS are compared to the 2012 ELMPs. For the measures to demonstrate reliability, the same determinants should be associated with measures of agency across surveys from similar time periods.

Results

Table 1 shows the individual descriptive characteristics for the ELMPs and EDHS samples of currently married women aged 15–49. On average, women are in their early 30s and were married around age 20. About half the respondents completed a secondary education. Only a fifth to a third of women have ever been employed.

For household characteristics, the average household size ranges from around four for the ELMPs 2012 sample to around six for the EDHS 2008 sample. Households are fairly evenly distributed across regions. Generally, a third of households are in rural Lower Egypt and a fifth of households are in Greater Cairo or Alexandria and the Suez Canal. The women's spouses are in their late 30s and have an average of a seven-year age difference with wives. Approximately half of the women's spouses have a secondary or higher education. Almost all the spouses have worked and are currently employed. There are some differences between the samples. In 2008, women from the DHS sample are slightly older with fewer years of education and a younger age at marriage. In 2014, women are also about a year older on average compared to the 2012 ELMPs, and the age at marriage is on average 20 years of age compared to 21 years of age in the

2012 ELMPs. Women in the DHS samples are also in larger households on average compared to women in the ELMPs samples.

Table 2 summarises the distributions of the agency outcome variables for each survey and year. For the 2006 ELMPs, women make an average of one individual household decision (Mean = 0.99, SD = 0.98), and for the 2008 EDHS, women make an average of 0.83 individual household decisions (Mean = 0.83, SD = 0.97) (see **Table 2**). For the 2012 ELMPs and 2014 EDHS, women also make close to one household decision on their own and closer to two household decisions with a spouse. While the values are close, there are significant differences in individual and joint decision-making between the comparable survey years. IPV attitudes are similar and not significantly different between the two surveys, with women agreeing that on average men are justified in beating their wives on at least one occasion (2006 ELMPs – Mean = 0.88, SD = 1.25; 2008 EDHS – Mean = 0.86, SD = 1.28).

Table 3 shows the distribution of household decision-making, both individual and joint, for all samples of women. Distributions are similar, but significantly different for individual and joint decision-making in the DHS in 2008 compared to the 2006 ELMPs and for the DHS in 2014 compared to the 2012 ELMPs. The main differences are observed for joint decision-making in the 2012 ELMPs and the 2014 EDHS. In 2014, 42% of women report making four household decisions with spouses, but in the 2012 ELMPs only 15% of women report making four household decisions with spouses.

Table 4 shows the side by side comparisons of the multivariate negative binomial regression models of individual decision-making, joint decision-making, and IPV attitudes for the 2006 ELMPs and the 2008 EDHS. For both the ELMPs and the EDHS, age is associated with more participation as for each year older a woman is, she makes more individual decisions ($p < .001$), all else held constant. The incidence rate ratios for age are similar across models (IRR: 1.01). The models also show the association that women who have ever worked make more household decisions as compared to women who have never worked (IRR: 1.12 and 1.13). Both models also show that women in rural Upper Egypt make fewer individual household decisions as compared to women in Cairo and Urban Governorates, but the rate ratios vary more widely (IRR: 0.53–0.95).

Table 1. Sample descriptive characteristics (means (SE) or %) of currently married women aged 15–49, 2006 and 2012 Egyptian Labor Market Panel Survey and 2008 and 2014 Egyptian Demographic and Health Survey

Key variables	ELMPS 2006 Married women N = 5798		EDHS 2008 Married women N = 13,801		ELMPS 2012 Married women N = 9030		EDHS 2014 Married women N = 18,172	
	N	% or Mean (SD)	N	% or Mean (SD)	N	% or Mean (SD)	N	% or Mean (SD)
INDIVIDUAL VARIABLES								
Age (years)	5798	32.0** (8.62)	13,801	33.5 (8.57)	9030	34.3* (11.5)	18,172	33.5 (8.22)
Education (years)	5798	7.79** (5.73)	13,801	6.87 (5.80)	9030	8.11 (5.49)	18,172	8.32 (5.43)
Age at marriage (years)	5798	20.8* (4.14)	13,801	19.6 (4.13)	9030	21.0* (4.27)	18,172	20.2 (4.15)
Ever employed								
No	4021	69.4	11,542	83.6	6584	72.9	15,282	84.1
Yes	1777	30.7	2259	16.4	2446	27.1	2890	15.9
HOUSEHOLD VARIABLES								
Household size	5798	5.26** (2.63)	13,801	6.07 (3.36)	9030	3.86*** (2.13)	18,172	5.16 (2.30)
Region								
Cairo and urban Governorates	1446	24.9	2024	14.7	1682	18.6	3096	17.0
Urban lower	741	12.8	1488	10.8	1077	11.9	2121	11.7
Urban upper	855	14.8	1604	11.6	1275	14.1	2150	11.8
Rural lower	1533	26.4	4026	29.2	2708	30.0	5011	27.6
Rural upper	1223	21.1	4659	33.8	2288	25.3	5794	31.9
Household wealth index								
Poorest	949	16.4	2825	20.5	1680	18.6	3276	18.0
Poorer	1197	20.7	2768	20.1	1885	20.9	3289	18.1
Middle	1256	21.7	2810	20.4	1950	21.6	3395	18.7
Richer	1218	21.0	2675	19.4	1875	20.8	3705	20.4
Richest	1178	20.3	2723	19.7	1640	18.2	4507	24.8
Husband's age in years	5798	38.7** (9.72)	13,801	40.5 (10.0)	9030	40.7 (12.6)	18,172	40.1 (9.83)
Husband's years of education	5798	9.07* (5.50)	13,801	8.26 (5.70)	9030	9.11 (5.17)	18,172	9.12 (5.25)

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ for tests of mean differences for 2006 vs. 2008 and 2012 vs. 2014

Table 2. Summary statistics of agency measures for currently married women aged 15–49, 2006 and 2012 Egyptian Labor Market Panel Survey and 2008 and 2014 Egyptian Demographic Health Survey

Key scales	Range	ELMPS 2006 N = 5,798		EDHS 2008 N = 13,801		ELMPS 2012 N = 9,030		EDHS 2014 N = 18,172	
		N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Agency measures									
Household decision-making									
Individual participation in decisions	0–4	5798	0.99** (0.98)	13801	0.83 (0.97)	9030	0.72** (0.95)	18172	0.86 (0.93)
Joint participation in decisions	0–4	5798	1.68*** (1.27)	13801	2.10 (1.46)	9030	1.62*** (1.45)	18172	1.90 (1.19)
IPV attitudes	0–4	5798	0.88 (1.25)	13801	0.86 (1.28)	–	–	–	–

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$ for tests of mean differences for 2006 vs. 2008 and 2012 vs. 2014

Despite these similarities, there are two differences. The EDHS model of individual decision-making shows that husband's education is significantly associated with decision-making (IRR: 1.01, $p < .01$), but the ELMPS does not support this result (IRR: 0.99). The ELMPS model shows less individual decision-making for women in the middle category of household wealth as compared to women in the poorest quintile (IRR: 0.88, $p < .001$), but the EDHS model does not support this (IRR: 0.95).

For both the ELMPS and the EDHS, women who have ever worked participate in more joint household decisions (IRR: 1.04 and 1.11, $p < .001$). Both models also show that women in larger households make fewer joint household decisions (IRR: 0.98 and 0.99, $p < .01$). Women in the richest households as compared to the poorest households make more joint decisions (IRR: 1.13 and 1.17, $p < .001$). For region, both models show that women in rural and urban Upper Egypt participate in fewer joint decisions as compared to women in Greater Cairo ($p < .001$). Results show that similar predictors are significant with similar incident rate ratios for joint decision-making in the 2006 ELMPS and 2008 EDHS.

For attitudes towards IPV, the last set of models show that for each additional year of education, women are less likely to accept IPV (IRR: 0.95 and

0.99, $p < .001$). Women in larger households are more likely to be accepting of IPV (IRR: 1.01, $p < .01$). Both the model for the 2006 ELMPS and the 2008 EDHS also show that women in rural and urban Upper Egypt are more accepting of IPV as compared to women in Cairo and Urban Governorates ($p < .001$). Results support household wealth as a predictor of IPV as women of all other wealth categories compared to the poorest women are less accepting of violence ($p < .001$), but the magnitude of the rates varies across surveys.

Table 5 shows the negative binomial regression models of women's household decision-making for the 2012 ELMPS and the 2014 EDHS. In 2012 and 2014, age is an inconsistent predictor of household decision-making. In the 2012 ELMPS, older women are less likely to make individual household decisions (IRR: 0.97, $p < .001$). However, age is not significant in the 2014 EDHS. Education is associated with both individual and joint decision-making in both surveys as for each additional year of education, women make more household decisions (IRR: 1.01, $p < .001$). Women who have ever been employed also make more individual and joint household decisions compared to women who have never worked ($p < .001$), but the magnitude of the rate varies (IRR: 1.06–1.30).

Table 3. Distribution of household decisions for currently married women aged 15–49, 2006 and 2012 ELMPS and 2008 and 2014 EDHS

	ELMPS 2006 N = 5798				EDHS 2008 N = 14,756			
	Individual*		Joint**		Individual		Joint	
Count of decisions 2006 and 2008	N	%	N	%	N	%	N	%
0	2151	37.1	1323	22.82	6274	45.46	2839	20.57
1	2139	36.89	1367	23.58	4752	34.43	2177	15.77
2	1028	17.73	1509	26.03	1874	13.58	3038	22.01
3	394	6.8	1057	18.23	594	4.3	2283	16.54
4	86	1.48	542	9.35	307	2.22	3464	25.1
	ELMPS 2012 N = 9030				EDHS 2014 N = 18,172			
	Individual***		Joint***		Individual		Joint	
Count of decisions 2012 and 2014	N	%	N	%	N	%	N	%
0	4929	54.58	3006	33.29	13,574	74.71	2660	14.64
1	2394	26.51	1507	16.69	2604	14.33	2118	11.66
2	1120	12.4	1768	19.58	1285	7.07	2976	16.38
3	480	5.32	1404	15.55	474	2.61	2730	15.03
4	107	1.18	1345	14.89	231	1.27	7684	42.29

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$ for chi-square tests of differences in distributions between surveys.

Similar to 2006 and 2008, the 2012 and 2014 surveys demonstrate consistent relationships for household region and wealth. Women in all other regions make fewer individual household decisions as compared to women in Cairo and the Urban Governorates ($p < .001$) with consideration variation in the incident rate ratios. Women in rural and urban Lower Egypt make more joint household decisions compared to women in the greater Cairo region ($p < .05$). Women in wealthier households are less likely to make individual household decisions, but more likely to make joint household decisions ($p < .01$). Women with more educated spouses are less likely to make individual household decisions, but more likely to make joint household decisions ($p < .05$).

Discussion

This study examines one aspect of the external reliability of women's empowerment measures and specifically, whether determinants of women's empowerment are consistently associated with instrumental and intrinsic agency for reproductive age married women in Egypt. Prior studies have examined the validity of women's empowerment,^{12,17} and others have only considered the influence of one determinant of agency at a time, primarily at the individual level and in South Asia.⁴⁶ This study contextualising empowerment in Egypt,⁹ examines multiple determinants of women's agency that are consistent upon repeated application with two nationally representative samples, and offers promising evidence for reproductive health, violence against women,

Table 4. Negative binomial models predicting currently married women's agency, 2006 Egyptian Labor Market Panel Survey and 2008 Egyptian Demographic and Health Survey

Key variables	ELMPS 2006 Individual decision- making		EDHS 2008 Individual decision- making		ELMPS 2006 Joint decision- making		EDHS 2008 Joint decision-making		ELMPS 2006 IPV attitudes		EDHS 2008 IPV Attitudes	
	IRR	(SE)	IRR	(SE)	IRR	(SE)	IRR	(SE)	IRR	(SE)	IR	(SE)
Age (years)	1.01***	(0.003)	1.01**	(0.002)	1.01*	(0.003)	1.01***	(0.001)	1.01	(0.003)	1.00	(0.002)
Education (years)	0.99	(0.004)	1.01	(0.003)	1.01***	(0.003)	1.01***	(0.002)	0.99**	(0.004)	0.95***	(0.003)
Older than 18 at first marriage	0.96	(0.035)	0.98	(0.022)	0.99	(0.030)	0.99	(0.015)	0.93*	(0.032)	0.97	(0.019)
Ever employed	1.12***	(0.034)	1.13***	(0.030)	1.11***	(0.026)	1.04*	(0.017)	1.03	(0.033)	0.97	(0.030)
Household size	0.96***	(0.006)	0.98***	(0.003)	0.99**	(0.005)	0.98***	(0.002)	1.01**	(0.005)	1.01***	(0.002)
Region (Ref = Greater Cairo)												
Urban lower	0.95*	(0.044)	0.84***	(0.034)	0.77***	(0.029)	1.09***	(0.023)	1.19	(0.072)	1.02	(0.054)
Urban upper	0.48***	(0.026)	0.86*	(0.039)	0.86***	(0.031)	0.89***	(0.020)	1.12**	(0.067)	1.35***	(0.063)
Rural lower	0.96*	(0.048)	0.92**	(0.031)	0.81***	(0.033)	1.06**	(0.021)	1.26	(0.078)	0.96	(0.041)
Rural upper	0.53***	(0.032)	0.95*	(0.035)	0.76***	(0.035)	0.79***	(0.017)	1.40***	(0.091)	1.52***	(0.063)
Household wealth index (Ref = Poorest)												
Poorer	0.98	(0.045)	0.99	(0.029)	0.98	(0.038)	1.05*	(0.023)	0.87***	(0.036)	0.89***	(0.021)
Middle	0.95	(0.045)	0.88***	(0.028)	1.01	(0.040)	1.13***	(0.025)	0.86***	(0.038)	0.82***	(0.023)
Richer	0.85**	(0.044)	0.82***	(0.030)	1.08	(0.045)	1.17***	(0.028)	0.75***	(0.039)	0.63***	(0.024)
Richest	0.80***	(0.047)	0.75***	(0.032)	1.13**	(0.051)	1.17***	(0.032)	0.58***	(0.036)	0.35***	(0.019)
Husband's age (years)	1.01*	(0.003)	1.01***	(0.002)	0.99**	(0.002)	0.98***	(0.001)	1.00	(0.003)	1.00	(0.002)
Husband's education (years)	0.99	(0.003)	0.99***	(0.002)	1.01**	(0.003)	1.01***	(0.002)	0.98***	(0.003)	0.98***	(0.002)
N	5798		13,801		5798		13,801		5798		13,801	

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$. Standard errors in parentheses.

Table 5. Negative binomial models predicting currently married women's agency, 2012 Egyptian Labor Market Panel Survey and 2014 Egyptian Demographic and Health Survey

Key variables	ELMPS 2012 Individual decision- making		EDHS 2014 Individual decision- making		ELMPS 2012 Joint decision- making		EDHS 2014 Joint decision- making	
	IRR	(SE)	IRR	(SE)	IRR	(SE)	IRR	(SE)
Age (years)	0.97***	(0.003)	1.00	(0.003)	0.97***	(0.002)	1.01***	(0.001)
Education (years)	1.01**	(0.003)	1.01***	(0.003)	1.01***	(0.002)	1.01***	(0.001)
Older than 18 at first marriage	1.01	(0.036)	0.95	(0.027)	1.06*	(0.027)	0.99	(0.010)
Ever employed	1.30***	(0.036)	1.22***	(0.038)	1.11***	(0.021)	1.06***	(0.013)
Household size	1.01	(0.008)	0.99*	(0.005)	1.00	(0.005)	0.99***	(0.002)
Region (Ref = Greater Cairo)								
Urban lower	0.81***	(0.040)	0.67***	(0.030)	1.05*	(0.037)	1.07***	(0.018)
Urban upper	0.50***	(0.027)	0.79***	(0.034)	0.99	(0.035)	1.02	(0.018)
Rural lower	0.81***	(0.044)	0.57***	(0.027)	1.11**	(0.043)	1.18***	(0.022)
Rural upper	0.57***	(0.034)	0.71***	(0.032)	0.89**	(0.037)	1.00	(0.019)
Household wealth index (Ref = Poorest)								
Poorer	0.96	(0.040)	0.95	(0.036)	1.02	(0.030)	1.10	(0.019)
Middle	0.91*	(0.039)	0.88**	(0.037)	1.12***	(0.033)	1.16***	(0.020)
Richer	0.88**	(0.041)	0.83***	(0.038)	1.15***	(0.036)	1.24***	(0.023)
Richest	0.83***	(0.045)	0.80***	(0.042)	1.18***	(0.042)	1.33***	(0.030)
Husband's age (years)	1.00	(0.002)	1.01***	(0.002)	1.00	(0.002)	1.00**	(0.001)
Husband's education (years)	0.99*	(0.003)	0.98***	(0.003)	1.01*	(0.002)	1.01***	(0.001)
N	9030		18,172		9030		18,172	

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$. Standard errors in parentheses.

and fertility research and programmes that operationalise empowerment as household decision-making and attitudes towards IPV.

This analysis lends support for the initial hypothesis. Although measures of household decision-making and attitudes towards IPV are often thought of as inconsistent and subject to many unsystematic threats of reliability, in the Egyptian context, these results show that agency measures are in fact, reliable. Variation in a

repeated measure can be due to chance, systematic inconsistency, or an actual change in the underlying event. The test-retest technique can be used to examine external reliability and assess measurement error, and these models constructed in the same way for two samples, demonstrate external reliability of the measures of agency.

Overall, the models of determinants of instrumental and intrinsic agency from the ELMPS and EDHS exhibit similar results. Individual,

household, and spousal characteristics were consistently associated with decision-making and attitudes towards IPV in two different nationally representative surveys that used the same measures. Given that the surveys were administered during similar time periods, the underlying events that affect women's agency are not likely to change. Women's individual characteristics like age, education, and employment are associated with greater household decision-making and less acceptance of IPV for both pairs of samples – the 2006 ELMPS and the 2008 EDHS as well as the 2012 ELMPS and the 2014 EDHS. Household size, region, and wealth are also consistently associated with both individual and joint decision-making and acceptance of IPV. These findings coupled with those that find measures of agency are valid in Egypt¹² provide support for the operationalisation of empowerment as decision-making and attitudinal measures of violence in Egypt. The findings also lend support for measures of women's status like education and employment being strong predictors of women's agency.

This study also shows that attributes of spouses like age and education are associated with women's agency. Educational equality between spouses may indicate more egalitarian relationships, but also a more egalitarian attitude on the part of families and communities. Generally, results demonstrate that older women with a higher education, who have ever been employed, who live in Cairo, Alexandria, or the Suez Canal, whose husbands have a higher education, and who live in the richer or richest households as opposed to the poorest households, generally make more household decisions and are less tolerant of IPV. These findings can inform the theoretical development of empowerment approaches and models for health and fertility research in Egypt.⁹ Additionally, the similarities in the determinants of agency across data sources, sampling frames, and samples imply that these measures of agency are reliable.

While the study finds two measures of agency reliable, these measures of instrumental and intrinsic agency do not capture all power dynamics within a married relationship. Having a final say in household decisions may have its own cost in other aspects of the married relationship. However, women's decision-making with others has been found to be associated with better women's reproductive health in Egypt,⁶ and measures of influence in family decisions are an important aspect

of women's agency in Egypt.¹² Additionally, while separating household decision-making into individual and joint decisions contextualises who is making the instrumental decisions, the questions on household decision-making provide little insight into the quality of discussions women may have had with partners or others. Another limitation includes the timing of the two surveys as they did not occur at exactly the same points in time; therefore, the two-year changes in time could contribute to variations observed. Nonetheless, this study makes important contributions to our understanding of how multiple dimensions of women's lives are associated with two dimensions of women's agency in Egypt. The great majority of research in this area has been conducted in South Asia, rather than Egypt or other Arab or North African countries.^{2,8} The associations in this study are examined using large samples of married women from an important Middle Eastern context and highly contextualised covariates, providing robust and relevant estimates. The findings are generalisable only to Egypt, but may be relevant for other country contexts with similar reproductive health status, fertility rates, and gaps in gender equity.

These findings have important implications for research and programmes on women's empowerment in Egypt and other areas of the world. As programmes continue to measure changes in women's agency in Egypt, household decision-making and attitudes towards IPV seem to be important dimensions to consider. Furthermore, the aspects of women's lives, like employment, that consistently contribute to women's agency across surveys should inform promotion of women's empowerment. Expansion of labour market opportunities for women and promotion of community shifts towards egalitarian gender norms should be encouraged. While evaluation of the measures of women's empowerment has been limited, recent efforts have aimed to better capture the abstract attributes of empowerment through latent measures and indices^{12,30} to inform the development of programmes and evaluate their effectiveness at empowering women. These findings further enhance these efforts by demonstrating that certain characteristics of women's lives are consistently associated with their decision-making power and their perception of IPV. These findings support the conceptualisation of women's agency in Egypt. The systematic approach to establishing reliability of the measures of women's agency in

national samples of Egyptian women should be replicated in other populations. These results are promising for programmes and policies that aim to enhance women's agency to promote women's health and well-being.

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Résumé

L'autonomisation des femmes, définie comme le processus par lequel les femmes acquièrent des ressources qui facilitent leur capacité d'agir, est une stratégie employée pour améliorer la santé reproductive des femmes. La capacité d'agir est conceptualisée comme la possibilité de définir des choix de vie. Néanmoins, les mesures de la capacité d'agir des femmes, par exemple la prise de décision dans le ménage, ne sont pas jugées dignes de foi. Les associations nulles et négatives entre l'autonomisation des femmes et la santé reproductive sont souvent attribuées à la faiblesse des mesures d'autonomisation qui semblent manquer de validité et de fiabilité. Cette étude utilise l'enquête égyptienne par panel sur le marché du travail (ELMPS) de 2006 et 2012 et l'enquête démographique et de santé égyptienne de 2008 et 2014 pour examiner la fiabilité des mesures de la capacité d'agir des femmes, en considérant les effets des caractéristiques individuelles et familiales des femmes sur leur capacité d'agir. Les deux enquêtes sont représentatives au niveau national, couvrent des périodes similaires et incluent les mêmes mesures de la capacité d'agir – la prise de décision dans le ménage et les attitudes à l'égard de la violence du partenaire intime. Les modèles de régression binomiale négative des déterminants individuels et familiaux de la capacité d'agir démontrent le degré auquel les mesures obtiennent des résultats cohérents après application répétée. Les résultats montrent que le même individu, le même ménage et les mêmes caractéristiques du partenaire étaient associés de manière constante à la prise de décision et aux attitudes à l'égard de la violence du partenaire intime dans les deux enquêtes. Les conclusions étayent la conceptualisation de l'autonomisation des femmes comme prise de décision dans le ménage et attitude à l'égard de la violence du partenaire intime en Égypte. Elles offrent aussi des données prometteuses pour l'utilisation de ces mesures dans la recherche sur la santé reproductive, sur les programmes de santé des femmes et dans le cadre de stratégies pour améliorer l'autonomisation des femmes.

Resumen

El empoderamiento de las mujeres, definido como el proceso por el cual las mujeres adquieren recursos facilitadores que mejoran su agencia, es una estrategia empleada para mejorar la salud reproductiva de las mujeres. Agencia es conceptualizada como la capacidad para definir las opciones personales. Sin embargo, las mediciones de la agencia de las mujeres, como la toma de decisiones domiciliarias, son consideradas como no fidedignas. Las asociaciones nulas y negativas entre el empoderamiento de las mujeres y la salud reproductiva a menudo son atribuidas a deficientes mediciones del empoderamiento que son percibidas como carentes de validez y confiabilidad. Este estudio utiliza la Encuesta de Panel del Mercado de Trabajo de Egipto (ELMPS, por sus siglas en inglés), realizada en los años 2006 y 2012, y la Encuesta Demográfica y de Salud de Egipto (EDHS), realizada en 2008 y 2014, para examinar la confiabilidad de las mediciones de la agencia de las mujeres considerando los efectos que tienen las características personales y domiciliarias de las mujeres en su agencia. Ambas encuestas son representativas a nivel nacional, fueron realizadas en similares períodos e incluyen las mismas mediciones de agencia: la toma de decisiones domiciliarias y las actitudes hacia la violencia de parejas íntimas (VPI). Los modelos de regresión binomial negativa de determinantes personales y domiciliarios de agencia demuestran en qué medida las mediciones obtienen resultados uniformes tras repetida aplicación. Los resultados muestran que las mismas características personales, domiciliarias y del cónyuge estaban asociadas de manera sistemática con la toma de decisiones y las actitudes hacia la VPI en las dos encuestas. Los hallazgos apoyan la conceptualización del empoderamiento de las mujeres como toma de decisiones domiciliarias y actitudes hacia la VPI en Egipto. Esto también ofrece evidencia prometedora para utilizar estas mediciones en investigaciones sobre salud reproductiva, en programas de salud de la mujer y como parte de las estrategias para mejorar el empoderamiento de las mujeres.