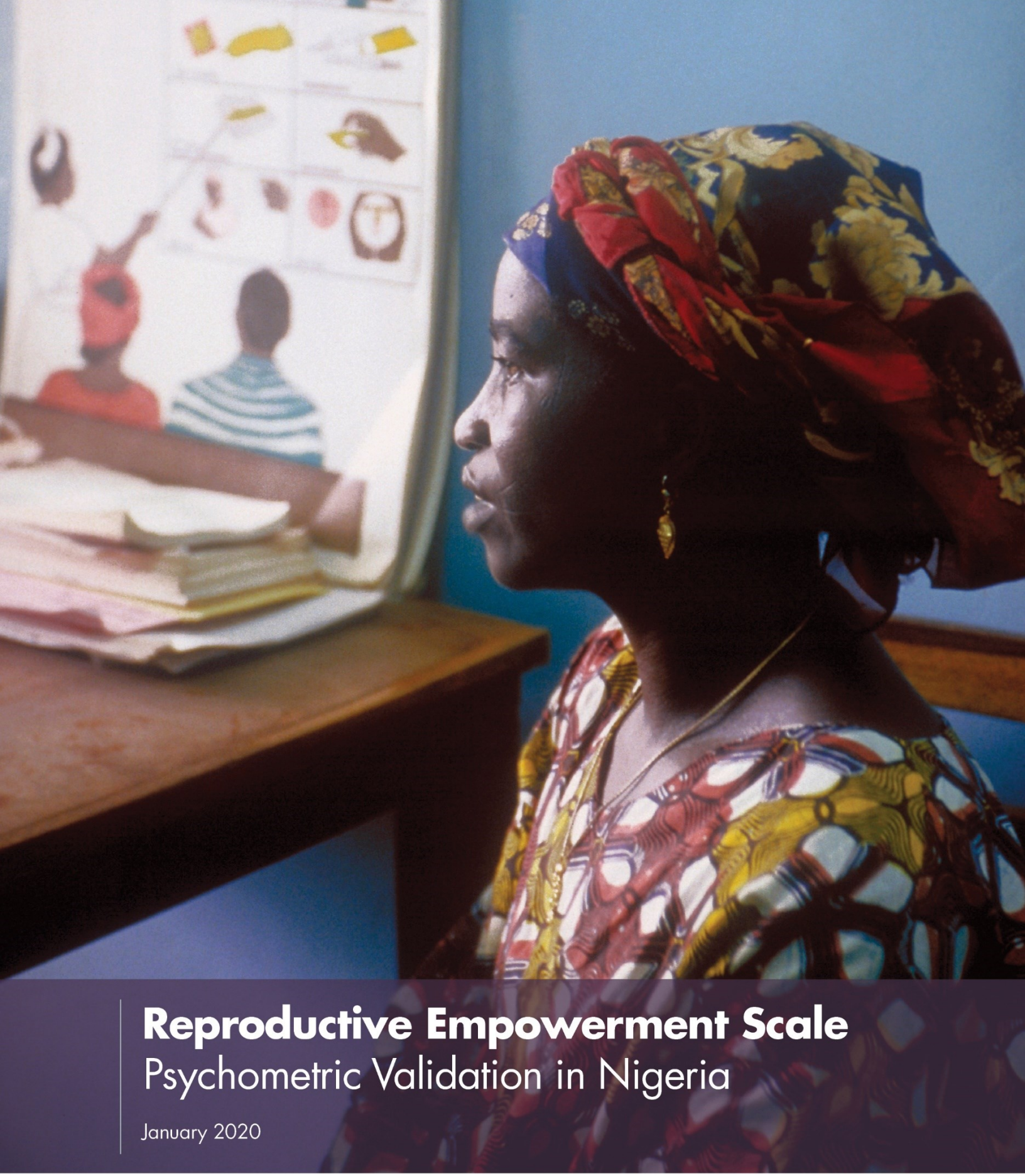

Reproductive Empowerment Scale

Psychometric Validation in Nigeria

January 2020

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MEASURE Evaluation

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Cover

A nurse in Jos, Nigeria, explains contraceptive options to a mother who wants to space her pregnancies further apart. Millions of women in Nigeria, Africa's most populous nation, would like to choose the timing of their pregnancies but lack access to family planning information and services.

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ABBREVIATIONS

aOR	adjusted odds ratio
CFA	confirmatory factor analysis
CI	cognitive interview
CI	confidence interval
DV	dependent variable
FL	factor loading
FP	family planning
MFP	Masculinities Faith, and Peace
OR	odds ratio
RE	reproductive empowerment
RH	reproductive health
USAID	United States Agency for International Development

ABSTRACT

MEASURE Evaluation, a project funded by the United States Agency for International Development (USAID), validated a previously developed measure of reproductive empowerment (RE) that can be used in evaluations or other types of surveys in sub-Saharan African countries, with the goal of providing family planning (FP) and reproductive health (RH) programs and national or regional governments with a tool to measure the status of and changes in RE in their populations. We examined the validity of the RE scale by embedding the scale items in a baseline survey, implemented from May to June 2019, for the evaluation of the John Templeton Foundation-funded Masculinities Faith, and Peace (MFP) intervention in Plateau State, Nigeria. First, we examined the psychometric properties of the scale by using confirmatory factor analysis (CFA). We assessed the construct validity of the scale by using logistic regression to test the association between RE and FP outcomes. The results from this study suggest that the final RE scale has considerable potential to be a valid and predictive measure of RE. When used in future studies, the scale should be psychometrically tested with various samples to provide additional data on its validity. The new 20-item RE scale presented in this report can be used to evaluate programs or interventions designed to improve women's RE and to assess the state of RE in populations of sub-Saharan Africa.

INTRODUCTION

Numerous studies have demonstrated that women's empowerment positively affects several reproductive health (RH) outcomes, including ideal family size preference (Hindin, 2000; El-Zeini, 2008; Hindin & Muntifering, 2011; McAllister, Gurven, Kaplan, & Stieglitz, 2012; Upadhyay & Karasek, 2012); birth intervals (Al Riyami & Afifi, 2003; Upadhyay & Hindin, 2005); ability to make fertility decisions (Jin, 1995; Gwako, 1997; Mason & Smith, 2000); and unintended pregnancies (Williams, Sobieszczyk, & Perez, 2000; Pallitto, Campbell, & O'Campo, 2005). However, a recent systematic literature review of women's empowerment and fertility revealed that approximately one-third of studies resulted in significant inverse findings and/or non-significant associations (Upadhyay, Gipson, Withers, Lewis, Ciaraldi, Fraser, … Prata, 2014). This suggests that the relationship between empowerment and fertility is inconsistent or unclear across empowerment domains, and that a focus on empowerment as it specifically links to family planning (FP) and other RH outcomes may be useful. In recent years, this domain of empowerment has been referred to as "reproductive empowerment" (RE).

Although commonly used instruments measuring the multidimensional construct of women's empowerment sometimes include survey items about reproductive-related decision making or autonomy, research has focused less often on measuring RE as a distinct dimension. We know of only one tool that has been developed and validated to explicitly measure domains about RE. Upadhyay et al's (Upadhyay, Dworkin, Weitz, & Foster, 2014) Reproductive Autonomy Scale has been validated in FP facilities in the United States; its applicability in international settings is not known. A tool loosely related to the lack of RE, the Reproductive Coercion Scale, measures pregnancy coercion and condom manipulation (McCauley, Silverman, Jones, Tancredi, Decker, McCormick,… Miller, 2017). However, this scale is limited in its scope. Given that all dimensions of empowerment, including RE, are contextually specific in both place and time, there is a need to develop a valid and reliable measure of RE that can be used in countries with different patterns of knowledge, attitudes, practices, and norms. MEASURE Evaluation decided to develop such a measure that could be used in evaluations or other types of surveys in sub-Saharan African countries, with the goal of providing FP/RH programs and national or regional governments with a tool to measure the status of and changes in RE in their populations.

Defining Reproductive Empowerment

MEASURE Evaluation has adopted the following definition of RE from a recently developed framework:

> *Both a transformative process and an outcome, whereby individuals expand their capacity to make informed decisions about their reproductive lives, amplify their ability to participate meaningfully in public and private discussions related to sexuality, reproductive health and fertility, and act on their preferences to achieve desired reproductive outcomes, free of violence, retribution, or fear* (Edmeades, Hinson, Sebany, & Murithi, 2018).

In the context of FP, this definition implies that individuals should be able to express their childbearing desires to their partners, healthcare providers, and others; meaningfully participate in communication and decision making with partners, with healthcare providers, and in their communities; and shape desired outcomes about marriage, the condition of sexual intercourse, and the use of contraception (Edmeades, Hinson, Sebany, & Murithi, 2018).

At the same time that the framework was developed, we identified existing RE measures by conducting a systematic review of the literature, examining studies from both developing and developed countries that sought to measure RE and FP/RH outcomes. A search of key terms from three databases resulted in 406 full-text articles that we reviewed. We abstracted data from 45 studies that created and validated their own scale, used a previously validated measure, or employed a combination of the two. Our review found that there was a need for contextually relevant measures of RE in sub-Saharan Africa (Edmeades, Hinson, Sebany, & Murithi, 2018).

Developing and Validating a Measure of Reproductive Empowerment

We developed a draft scale of RE using the following steps. First, through the literature review mentioned above, we identified domains and subdomains of RE documented in existing studies. In conjunction with the International Center for Research on Women, we shared our findings from the systematic review during a 2016 consultative meeting in Washington, DC with experts in RH and empowerment research and measurement. We discussed the domains and subdomains and related measurement issues uncovered, and received feedback on the limtiations and gaps in the literature based on the work and experience of the experts (Edmeades, Hinson, Sebany, & Murithi, 2018).

We then conducted focus group discussions with men and women in Zambia to explore in depth the meaning of the identified domains and subdomains of RE, and to find new domains and subdomains. At the end of this process, we created a draft RE scale with 43 items across five subscales: (1) communication and decision making (eight items); (2) partner communication (five items); (3) social support (four items); (4) social norms (11 items); and (5) critical consciousness (15 items) (Paul, Mejia, Muyunda, & Munthali, 2017) .

Third, we pretested the 43 survey questions using cognitive interviews (CIs) with women in Nigeria. Based on an iterative process of analyzing the results from the CIs, revisiting the literature on the measurement of RH and related constructs, and examining the draft RE scale in light of the results of the CIs and the existing literature, we revised the draft RE scale by reorganizing the RE domains and items. We split the construct into six domains with a total of 29 items: healthcare provider communication (five items); partner communication (six items); decision making (six items); social support (three items); social norms (five items); and critical consciousness—endorsement of equality in RH (four items) (Mandal, Treves-Kagan, & Mejia, 2019) (Appendix A).

The final step in examining the validity of a scale is to test the prototypical scale items in a broader survey. The objective of this study was to finalize the RE scale and assess its psychometric properties.

METHODS

Study Design

We examined the validity of the RE scale by embedding the scale items in a baseline survey that was implemented from May to June 2019 for the evaluation of the Masculinities Faith, and Peace (MFP) intervention in Plateau State, Nigeria. The evaluation, implemented by the Institute of Reproductive Health at Georgetown University and funded by the John Templeton Foundation, is a longitudinal study using quantitative and qualitative methods to collect data on the impact of an intervention with religious communities to change gender norms around intimate partner violence and FP and RH. The Institute of Reproductive Health selected Plateau State in Nigeria because of its relatively low use of FP and high level of intimate partner violence and gender inequality. The MFP intervention is being implemented with ten religious congregations (five Christian and five Muslim, which are part of the intervention group), with plans for scaling up to another ten religious congregations (that are currently part of the control group).

At the end line, the member of the couple who participated in the baseline will be contacted using telephone numbers provided at the baseline and/or with assistance from religious leaders. Consent for participation will be obtained again and the respondent will be given the survey instrument to assess change.

Sample

The sampling frame consisted of a list of young adult female and male members of the 10 congregations generated by religious leaders working with the study team. The sample comprised of women ages 18 to 35 years and their male partners of any age. Inclusion criteria were that the couple had been married in the past five years and were cohabitating and, if the couple had children, their oldest shared biological child was not older than four years at the time of the survey. The rationale for this target group was to reach young couples early in their sexual lives, at a point where their attitudes, beliefs, and practices were more malleable, and for some, before they had started their families.

A random sample of approximately 20 females and their 20 male partners in each selected intervention and control congregation were selected to take the survey. To ensure random sampling, the names in the intervention and control communities were ordered alphabetically and assigned a chronological number starting with number one. A random number generator listed the couple names in order of invitation into the study. The recruiter used an eligibility screener to recruit study participants. The final sample size for the full baseline survey was 470 women and 407 males. Results from the nested study aimed at validating the RE scale are limited to the sample of women.

Study Measures

The survey included all items from the RE scale, with four-level Likert response options for most of the questions (strongly disagree, disagree, agree, and strongly agree). Based on the previous steps of survey development and the results of the CIs, the prototypical RE scale was hypothesized to fit the data as a six-factor model, with each factor corresponding to the conceptualized domains.

Values for the RE scale and each subscale were calculated by summing the response scores of each scale item (whole numbers from one to four) and dividing the total score by the number of items. It should be noted that

we reverse-scored responses to items that originally used a higher score to indicate being less empowered.[1] This yielded a continuous score for RE, with a score of four representing the highest level of empowerment and one representing the lowest level of empowerment possible.

To test the construct validity of the final confirmed RE scale, three dichotomous variables theoretically related to RE were created from other survey questions. Each was included as a dependent variable (DV) in a model for analysis, with the main independent variable of RE:

DV #1: Currently doing something to prevent pregnancy (yes, no), calculated for the subset of female respondents who reported that they were not pregnant or did not want a child.

DV #2: Currently using a method of modern contraception (yes, no), calculated for the subset of female respondents who reported that they were not pregnant or did not want a child.

DV #3: Likely to use a modern method of contraception in the future (likely or extremely likely/unlikely or extremely unlikely), calculated for the subset of female respondents who reported that they had not done or used something to avoid or delay pregnancy.

The following covariates representing demographic characteristics were included in the study: age (continuous), highest level of education (ordinal), parity (dichotomous), male partner had other wives (dichotomous), hunger experienced in the household (dichotomous), and religion (nominal).

Data Analysis

All data were analyzed in SAS 9.4. We examined the psychometric properties of the scale by using CFA to assess how well the data from the full sample fit a six-factor model, as the prototypical RE scale was conceptualized based on results from the CIs. Next, we calculated the internal reliability of the scale via Cronbach's alpha. Finally, we assessed the construct validity of the scale—the extent to which the scale was associated with other measures representing a related concept—by using logistic regression to test and quantify the association between RE and FP/RH outcomes. We ran three models, each using RE as the main independent variable and DVs #1 to #3, as defined above. We tested both crude and adjusted models for each DV. Adjusted models controlled for the covariates listed above.

[1] For survey items that did not use Likert response options, we scored the responses as: 4=My partner and myself jointly; 3=Myself; 2=My partner; 1=All other options. This is based on a body of literature that suggests that joint decision making among couples is related to greater use of contraception (Islam, 2018; Samari, 2018; Mahendra, Wilopo, & Putra, 2019;) and to lower levels of intimate partner violence (Hindin & Adair, 2002; Gage, 2005; Flake, 2006; Zegenhagen, Ranganathan, & Buller, 2019), both of which indicate greater levels of empowerment.

RESULTS

Demographic Characteristics

The average age of female survey respondents was 25.4 years. About one-third had some secondary school education and approximately one-quarter had completed secondary school. Eighty-four percent had at least one child and 13 percent had partners who were married to other wives. Nearly one-half of the respondents reported that their households had ever experienced hunger. Approximately two-thirds of the respondents identified as Muslim and the remaining identified as Christian (Table 1).

Table 1. Demographic characteristics of respondents, Plateau State, Nigeria, 2019

	Full sample (n=470)	Models 1 & 2 sample (n=289)	Model 3 sample (n=262)
Age at enrollment			
Mean (SD)	25.4 (5.15)	22.9 (3.79)	21.9 (3.47)
Median (min–max)	25 (18 – 43)	22 (18 – 35)	21 (18 – 35)
Missing	0	0	0
Highest level of education			
Never attended school	30 (6.4%)	17 (5.9%)	21 (8.0%)
Incomplete primary	44 (9.4%)	24 (8.3%)	31 (11.8%)
Completed primary	79 (16.8%)	47 (16.3%)	52 (19.9%)
Incomplete secondary	153 (32.6%)	106 (36.7%)	81 (30.9%)
Completed secondary	111 (23.6%)	64 (22.2%)	56 (21.4%)
Higher than secondary	53 (11.3%)	31 (10.7%)	21 (8.0%)
Missing	0	0	0
Parity			
Nulliparous	77 (16.4%)	9 (3.1%)	71 (27.1%)
1+ child(ren)	393 (83.6%)	280 (96.9%)	191 (72.9%)
Missing	0	0	0
Partner had other wives			
Yes	61 (13%)	36 (12.5%)	30 (11.5%)
No	409 (87%)	253 (87.5%)	232 (88.6%)
Missing	0	0	0
Hunger ever experienced in the household			
Yes	204 (43.4%)	140 (48.4%)	102 (38.9%)
No	266 (56.6%)	149 (51.6%)	160 (61.1%)
Missing	0	0	0
Religion			
Christian	167 (35.5%)	102 (35.3%)	84 (32.1%)
Muslim	303 (64.5%)	187 (64.7%)	178 (67.9%)
Missing	0	0	0

Psychometric Properties: CFA

There were no missing data for the RE scale items. CFA using a six-factor model with an oblique rotation and correlated errors did not fit the data well (Table 2). All items under the Healthcare Provider Communication and Social Support factors had high loadings. The following items did not have high loadings under their respective factors and were dropped from subsequent CFA models:

- Item 11: "It is easier for you to get contraception in secret rather than trying to talk with your partner to get his approval" (Partner Communication factor loading [FL]=-1.0812; p=0.28). This was dropped because the item assumed that the woman wanted to use contraception.
- Item 14: "Do you agree or disagree with the decision made in a recent conversation about the use of family planning?" (Decision Making FL=.2492, p=.80). This item was dropped because information was not obtained about whether the decision made was empowering and, therefore, there was no information about whether agreeing or disagreeing with the decision was empowering. A woman may have agreed with a decision (or not have had the choice to disagree) that she did not like or that was not empowering.
- Item 24: "You would be shocked or surprised if a friend of the family who you were close to told you she refused sex with her partner because she does not feel like having sex" (Social Norms FL=-1.2576; p=0.21). This item was dropped because it was complex, involving many concepts, and the object of the surprise—refusing sex or not feeling like having sex—was unclear.
- Item 25: "Friends or family members would be shocked or surprised if they knew that you refused sex with your partner because you did not feel like having sex" (Social Norms FL=-.8868; p=0.38). This item was dropped because the object of the surprise—refusing sex or not feeling like having sex—was unclear.
- Item 27: "Wives should not be considered their husband's property" (Critical Consciousness FL=1.4336; p=0.15). This item was dropped because it is not directly about RH.

The Critical Consciousness factor had four items, two of which loaded well and two that did not. Given that measuring items in this factor (or domain) was especially problematic in the previous study of CIs (Mandal, Treves-Kagan, & Mejia, 2019), the authors concluded that the factor was not well defined. Although item 27 was dropped from the model, the remaining items in the Critical Consciousness factor (item 26: "Women should have less say than men over using contraception"; item 28: "Women should be able to initiate sex with their partners"; and item 29: "Women should be able to refuse sex with their partner without fear of their partner getting angry, violent, or threatening to leave") were moved to the Decision Making factor. The Critical Consciousness factor was then dropped from the full RE scale.

We restructured the scale to create a five-factor model (i.e., five-factor model A). After using CFA on this model and examining the factor loadings of individual items (data not shown) and model fit statistics (Table 2), we further reduced the scale by dropping items 26, 28, and 29 from the Decision Making factor and from the full RE scale.

The third structure (five-factor model B), which includes factors Partner Communication, Healthcare Provider Communication, Decision Making, Social Norms, and Social Support—called subscales from this point forward—fit the data best (Table 2). Five-factor model B, representing the full RE scale (Table 3), was chosen

as the final scale to examine whether RE predicts pregnancy prevention and FP outcomes. This scale had high internal reliability, as indicated by a Cronbach's alpha of .87.

Table 2. Fit statistics for the six-factor, five-factor A, and five-factor B models for CFA

	Six-factor	Five-factor model A	Five-factor model B	Cutoff for good fit[2]
Model Chi-Square, p-value[3]	<.0001	<.001	<.0001	>.05
Root Mean Square Error of Approximation (RMSEA)	.0661	.0651	.0608	<.08
Bentler Comparative Fit Index	.7916	.8512	.9014	≥.90
Standardized Root Mean Square Residual (SRMR)	.0948	.0751	.0816	<.08

Table 3. Final RE scale

RH Health Care Provider Communication

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

1. You and your health care provider talk about using contraception.
2. You can initiate conversations about using contraception with your health care providers.
3. You can ask your health care provider questions about using contraception.
4. You can share your opinions about using contraception with your health care providers.
5. When discussing contraception with your health care provider, s/he pays attention to what you have to say

RH Partner Communication

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

6. You can initiate conversations about using contraception with your partner.
7. You can share your opinions about using contraception with your partner.
8. You can share your opinions about how many children you want to have with your partner
9. You can tell your partner that you don't feel like having sex without him getting angry, violent, or threatening to leave.
10. When having conversations about sex and sexual reproductive health with your partner, he pays attention to what you have to say.

[2] Source: Cornell University Cornell Statistical Consulting Unit

[3] This fit statistic is sensitive to sample size.

RH Decision Making

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

11. You can use contraception even if your partner doesn't want you to.
12. You can refuse sex with your partner if you don't want to have sex.

Please answer with one of the following options:

"Myself"
"My partner"
"My partner and myself jointly
"My parents"
"My partner's parents"
"Another family member"
"Healthcare provider"
"Other (specify)"
"Don't know"

13. Who makes the final decision about whether or not you use contraception?
14. Who do you want to make the final decision about whether or not you use contraception?

RH Social Support

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

15. If your partner did not want you to use contraception, you have a friend or family member who could help you convince your partner that you should use contraception.
16. If your partner did not want you to use contraception, you could go to people in your community who know about contraception and could help you convince your partner that you should use contraception.
17. If your partner did not want you to use contraception, you have friends or family who would support you getting contraception anyway.

RH Social Norms

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

18. Friends or family members you are close to can decide when they want to use contraception.
19. Friends or family members you are close to use contraception even when their partner does not want them to.
20. Friends or family members you are close to think you should be able to decide when to use contraception.

Predictive Validity: Regression

Table 1 shows the demographic characteristics of the full sample and restricted samples based on regression analyses using the DVs mentioned above (DV#1: Currently doing something to prevent pregnancy among respondents who reported they did not want a child; DV#2: Currently using a method of modern contraception among respondents who reported that they were doing something to delay or avoid pregnancy; and DV#3: Likely to use a modern method of contraception in the future among respondents who reported that they had not done or used something to delay or avoid pregnancy). The demographic characteristics of the respondents in the second and third regression models differed slightly from those in the first model and in the full sample because of restricting the sample.

The mean RE score was 2.85 for the full sample and for the restricted sample used in model 3; and 2.88 for the restricted sample used in models 1 and 2. Given that this is slightly above the middle of the range of possible values (1–4), it indicated that women in this sample had slightly above a moderate level of RE (Table 4).

Table 4. Mean RE scores among respondents, Plateau State, Nigeria, 2019

	Full sample (n=470)	Models 1 & 2 sample (n=289)	Model 3 sample (n=262)
RE score			
Mean (SD)	2.85 (.38)	2.88 (.37)	2.85 (.38)
Missing	0	0	0

In both the crude and adjusted models, RE was associated with all three FP/RH outcomes (Table 5). Among respondents who did not want a child, women who were more reproductively empowered had higher odds of doing something to prevent pregnancy at the time of the survey ($p<.01$) (Figure 1), and of using a modern method of contraception at the time of the survey ($p<.0001$) (Figure 2). Among women who had previously not done or used something to avoid getting pregnant, women who were more reproductively empowered had higher odds of being likely or extremely likely to use a modern method of contraception in the future ($p<.0001$) (Figure 3). Model 3 had relatively wide confidence intervals (CIs), which may be a result of high variability in the data.

Table 5. Crude and adjusted logistic regression models for FP/RH outcomes, Plateau State, Nigeria, 2019

	Crude		Adjusted	
	OR	95% CI	aOR	95% CI
Model 1	3.27	(1.66, 6.72)	3.29	(1.59, 7.08)
Model 2	3.75	(1.87, 7.53)	4.17	(1.96, 8.84)
Model 3	7.52	(3.47, 17.63)	7.23	(3.32, 17.05)

OR=odds ratio
aOR=adjusted odds ratio

Figure 1. Odds ratio of doing something to prevent pregnancy, among women who did not want a child, n=289

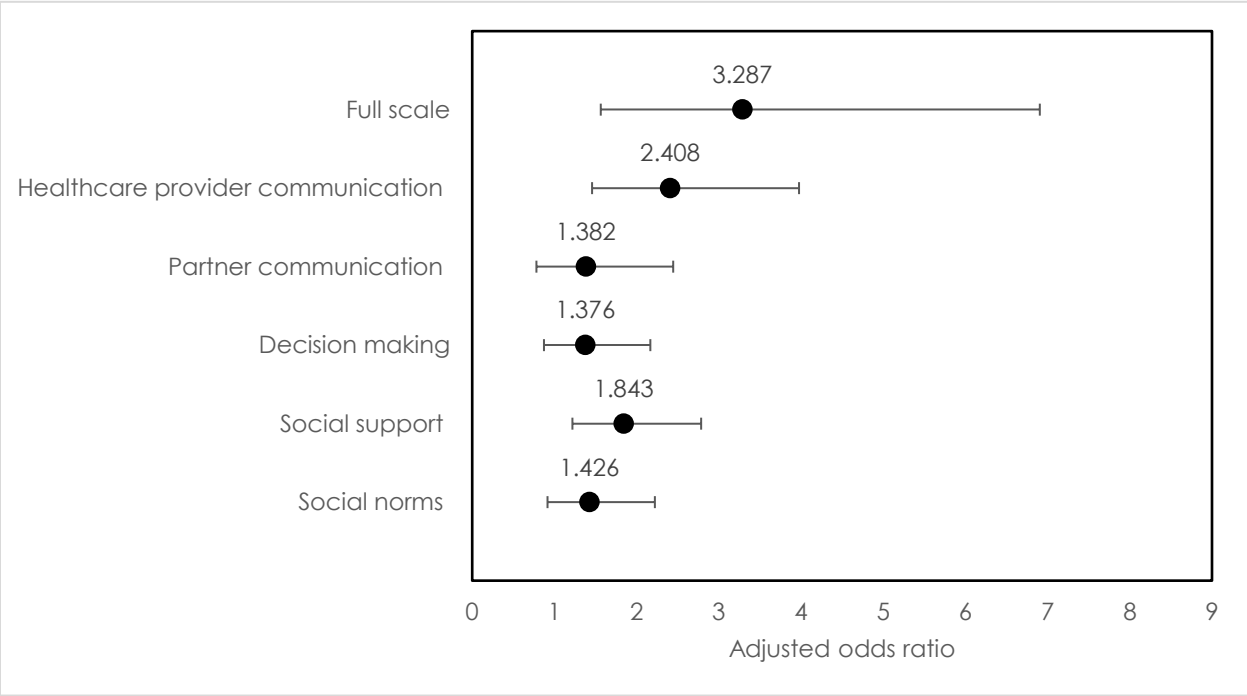


Figure 2. Odds ratio of using a modern method of contraception, among women who did not want a child, n=289

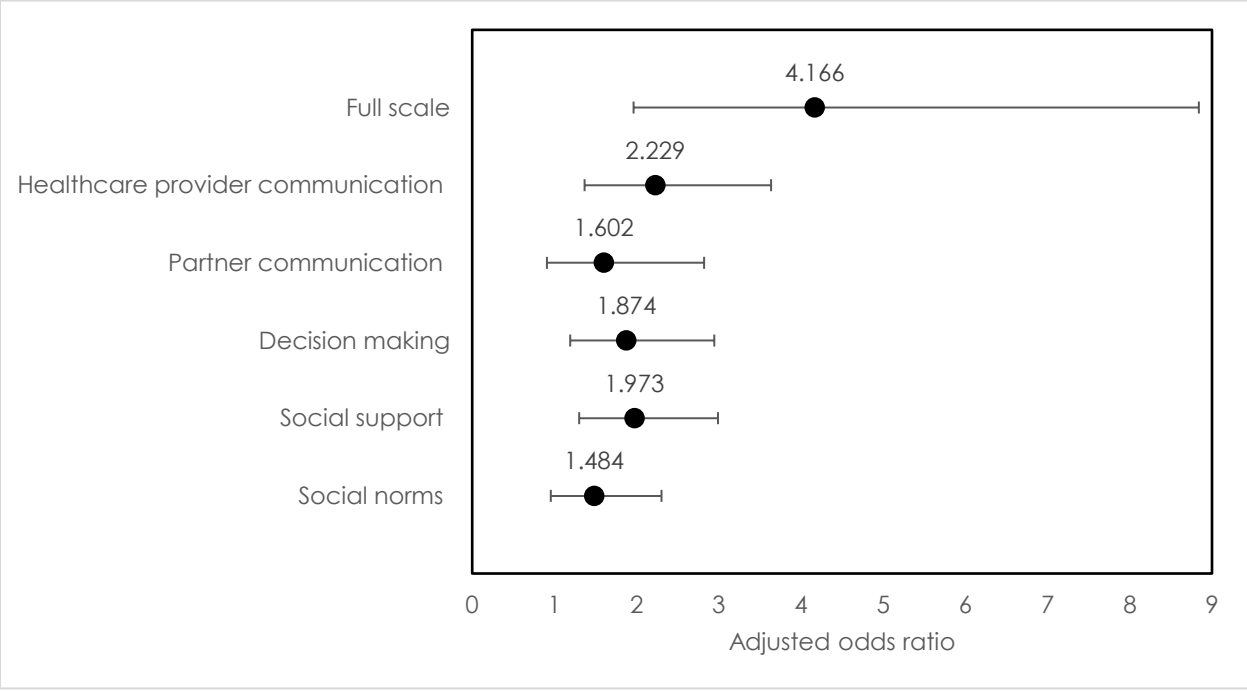
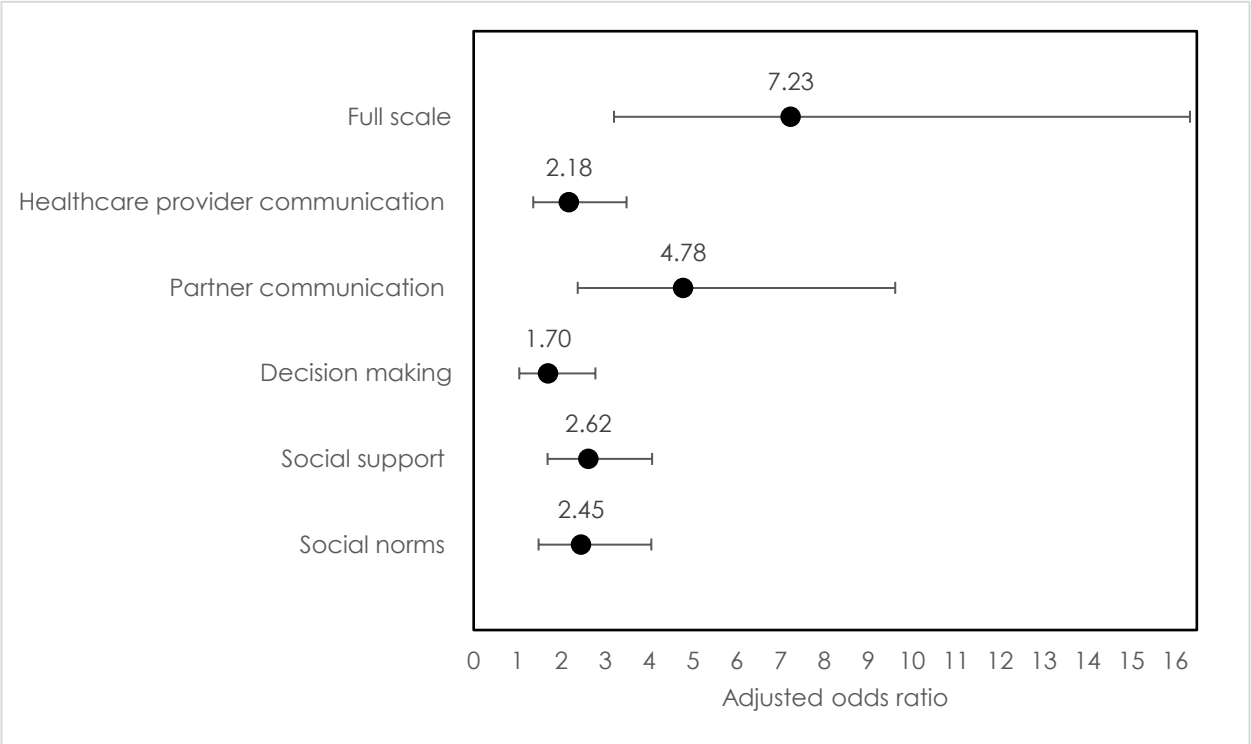


Figure 3. Odds ratio of being likely or extremely likely to use a modern method of contraception in the future, among women who had not done or used something to avoid or delay pregnancy, n=262



DISCUSSION

The results of this study suggest that the final RE scale has considerable potential to be a valid and predictive measure of RE. As indicated by results of the CFA, the RE scale includes five subscales, which range from measuring interactions in interpersonal relationships (healthcare provider communication and partner communication); a combination of intrapersonal processes and interpersonal interactions (decision making); and dynamics with the broader community (social support and social norms). The regression models indicate that the RE scale is related to and potentially predicts use of FP.

Through the iterative process of examining the three CFA models, it became clear that critical consciousness was not a well-defined factor in the RE scale; it was therefore dropped. Critical consciousness is defined as the capacity of oppressed or marginalized people to critically analyze their social and political conditions, endorse societal equality, and take action to change perceived inequities (Diemer, Rapa, Park, & Perry, 2017). In one of the previous steps of scale development, during which focus group discussions were used to surface potential RE constructs and items, elements of cricital consciousness, such as women wanting the same rights as men in their households and wanting their opinions to be respected, were mentioned mainly by women attending post-secondary education. Women with less than post-secondary eduation did not discuss such topics (Paul, Mejia, Muyunda, & Munthali, 2017). Given that only 11 percent of the women in the sample had post-secondary education, and assuming that post-secondary education is related to critical consciousness, there may not have been an adequate propotion of women in our study who were cognizant of such concepts as gender equality to respond to the survey items about critical consciousness in an informed manner. Relatedly, there may not have been adequate variability in the data around the original critical consciousness items for the data to fit a factor representing the domain. This indicates that more work is needed to develop valid ways to measure levels of critical consciousness while taking into account the challenges of measurement in a population where criticial consciousness is quite low and with low variability.

As previously mentioned, the Reproductive Autonomy scale (Upadhyay, Dworkin, Weitz, & Foster, 2014) is the only other scale with which we are famliar and that directly measures some dimensions of RE as conceptualized by the International Center for Research on Women and MEASURE Evaluation (Edmeades, Hinson, Sebany, & Murithi, 2018). The Reproductive Autonomy scale has three subscales: freedom from coercion, communication, and decision making. Our RE scale expands on the Reproductive Autonomy scale in several ways. First, the RE scale separates the subscale of communication into communication with a partner and communication with a healthcare provider. The RE scale also includes the measurement of elements that lie at the community level: social support and social norms. Finally, unlike the Reproductive Autonomy scale and inline with the objective of this study, the RE scale was developed and validated in settings outside the developed world.

Limitations

This study has several limitations. First, the sample consists of members of religious congregations, and the results may not be generalizable to non-religious populations. This may especially true given that membership in a religious community is often related to perspectives on health and social topics.

Joint decision making was scored as most empowered in the RE scale. However, quantitative measures of decision making cannot fully determine the level of empowerment participants may experience from joint

decision making, given that the quality of the decision-making process is not measured. Moreover, joint decision making may be empowering in some contexts (and among some couples) but disempowering in other contexts (and among other couples), depending on the history of the individual and the couple, and the social environment in which they interact.

The data that have been collected and analyzed thus far for the MFP evaluation are cross-sectional. We therefore do not know whether RE predicts FP and RH outcomes, or whether those with certain RH profiles are more likely to be reproductively empowered. Although this limitation does not affect the psychometric properties of the RE scale, it bears mentioning because one of the main purposes of developing the RE scale is to use it to evaluate programs or interventions designed to improve RE as a path to improved FP and RH outcomes.

Finally, this RE scale was validated in Plateau State, Nigeria, a setting with high levels of fertility and low levels of contraceptive use. The scale may not perform as well in other countries that have lower fertility and higher contraceptive use.

RECOMMENDATIONS

Although the overall objective of this study (and all preceding steps to develop and preliminarily validate the RE scale) was to create a measure that can be used across sub-Saharan African countries, the diversity of ethnic, religious, and sociocultural groups of people in the continent limit our ability to conclude whether the scale is valid with different African populations. Given that all dimensions of empowerment are contextually relevant in both time and space, there is need to continue to use and validate the RE scale in various settings. The RE scale should be validated via the end line survey of the evaluation of the MFP intervention, scheduled for 18 months after baseline data collection (mid-2020). Analyzing longitudinal data will help determine whether the level of RE among women changes over time and whether changes in RE co-occur with changes in pregnancy prevention and FP outcomes. Such results would provide evidence about whether the scale measures RE as both a *process* and an outcome.

Given that the development (via focus group discussions) and partial validation (via CIs) of the RE scale included samples of adolescents (however, this specific study included women ages 18 to 35 years only), the psychometric properties and predictive validity of the scale should be further examined with a sample of adolescents ages 15 to 19 who are married or in partnerships. This is especially salient given that notions of gender and empowerment begin to form in early childhood, and the adolescent period in the life course is fundamental to shaping ideas, perceptions, and generational norms about gender and empowerment. It is critical to design and implement interventions that focus on increasing adolescents' RE to improve their FP and RH outcomes, and it is therefore important to understand whether the RE scale is valid with adolescent populations.

CONCLUSIONS

Addressing RE is critical to preventing unintended pregnancies and increasing the use of modern contraceptive methods. This RE scale has good psychometric properties, including high internal consistency (via CFA and Cronbach's alpha) and demonstrates predictive validity (via regressions). When used in future studies, the scale should be psychometrically tested with various samples to provide additional data on its validity. The new 20-item RE scale introduced in this report can be used to evaluate programs or interventions designed to improve women's RE and to assess the state of RE in populations of sub-Saharan Africa.

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APPENDIX A. PROTOTYPICAL REPRODUCTIVE EMPOWERMENT SCALE

Respondents are females (ages 15–49 years) who currently have a male spouse/partner

RH Healthcare Provider Communication

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

1. You and your healthcare provider talk about using contraception.
2. You can initiate conversations about using contraception with your healthcare providers.
3. You can ask your healthcare provider questions about using contraception.
4. You can share your opinions about using contraception with your healthcare providers.
5. When discussing contraception with your healthcare provider, s/he pays attention to what you have to say

RH Partner Communication

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

6. You can initiate conversations about using contraception with your partner.
7. You can share your opinions about using contraception with your partner.
8. You can share your opinions about how many children you want to have with your partner?
9. You can tell your partner that you don't feel like having sex without him getting angry, violent, or threatening to leave.
10. When having conversations about sex and sexual reproductive health with your partner, he pays attention to what you have to say.
11. It is easier for you to get contraception in secret rather than to try to talk with your partner to get his approval.

RH Decision Making

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

12. You can use contraception even if your partner doesn't want you to.
13. You can refuse sex with your partner if you don't want to have sex.

Please answer "yes" or "no".

14. In your most recent conversation with your partner about whether or not to use contraception, was a decision made?

Please answer "agree" or "disagree".

15. Did you agree or disagree with the decision about whether or not to use contraception?

Please answer with one of the following options:

"Myself"
"My partner"

"My partner and myself jointly
"My parents"
"My partner's parents"
"Another family member"
"Healthcare provider"
"Other (specify)"
"Don't know"

16. Who makes the final decision about whether or not you use contraception?
17. Who do you want to make the final decision about whether or not you use contraception?

RH Social Support

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

18. If your partner did not want you to use contraception, you have a friend or family member who could help you convince your partner that you should use contraception.
19. If your partner did not want you to use contraception, you could go to people in your community who know about contraception and could help you convince your partner that you should use contraception.
20. If your partner did not want you to use contraception, you have friends or family who would support you getting contraception anyway.

RH Social Norms

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

21. Friends or family members you are close to can decide when they want to use contraception.
22. Friends or family members you are close to use contraception even when their partner does not want them to.
23. Friends or family members you are close to think you should be able to decide when to use contraception.
24. You would be shocked or surprised if a friend or family member you are close to told you she refused sex with her partner because she does not feel like having sex.
25. Friends or family members you are close to would be shocked or surprised if they knew that you refused sex with your partner because you did not feel like having sex.

Critical Consciousness—Endorsement of RH Equality

For each statement, please state if you "strongly agree", "agree", "disagree" or "strongly disagree".

26. Women should have less say than men over using contraception.
27. Wives should not be considered their husband's property.
28. Women should be able to initiate sex with their partners.
29. Women should be able to refuse sex with their partners without fear of their partners getting angry, violent or threatening to leave.

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