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Measuring Norms and Beliefs about Gender-Based Violence among Adolescent Girls and Young Women in Rural Senegal

Psychometric Validation in a Novel Population and Setting

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Introduction

Intimate partner violence (IPV) and non-partner sexual violence (NPSV) are forms of gender-based violence (GBV) and contribute to a range of poor mental and physical health outcomes (Beydoun et al., 2012; Dillon et al., 2013; Flor et al., 2025). Among ever-partnered women aged 15 and older in the Africa region, 33% report physical and/or sexual IPV in their lifetime and 19% in the past year (Sardinha et al., 2022). In addition, the lifetime prevalence of NPSV among woman aged 15 to 49 years is 6% in sub-Saharan Africa (Sardinha et al., 2024). Norms (i.e., the societal expectations and rules that dictate acceptable behavior in a given context) that consider GBV acceptable in its various forms perpetuate GBV by reinforcing its acceptability. Among interventions that aim to reduce the prevalence of GBV, many aim to do so, at least in part, by changing both norms and beliefs about GBV (Leight et al., 2023; Ullman et al., 2025). Validated scales for measuring these outcomes are limited, but important for understanding factors that contribute to changes in norms and beliefs.

In this project note, we aim to establish the psychometric validity of scales measuring injunctive norms (e.g., perception of whether behaviors are socially acceptable) and personal beliefs about husband's right to violence and responses to sexual violence from the Social Norms and Beliefs about GBV Scale. The Social Norms and Beliefs about GBV Scale was developed in Somalia and South Sudan for use in humanitarian/high-conflict settings and was validated with a

sample of women and men 15 to 61+ years old (Perrin et al., 2019). The scale has not yet been validated or widely used in non-humanitarian settings, in contexts where the prevalence of GBV is generally lower, such as Senegal, or among adolescent or youth populations. Our current analysis uses data from a larger mixed-methods impact evaluation of a Senegalese edutainment series *C'est La Vie*! on a range of GBV and sexual and reproductive health outcomes, using a sample of approximately 4000 adolescent girls and young women 13 to 34 years old (Dione et al., 2023; Le Port et al., 2022).

Social norms are the informal rules that dictate and uphold what is considered acceptable, appropriate, and obligatory within a social group (Cialdini et al., 1990; Cislaghi et al., 2018, 2019; Cislaghi & Heise, 2018; Harper & Marcus, 2018; Social Norms Learning Collaborative, 2021). While perceptions of social norms are measured at the individual level, social norms are considered an attribute of a group, based on shared beliefs (Harper and Marcus, 2018; Pearse and Connell 2016). Gender norms are a particular class of social norms that define appropriate and acceptable behaviors according to perceived sex and reinforce a broad range of gender inequalities (Cislaghi & Heise, 2020). Further, GBV norms are a specific category of harmful gender norms that normalize and perpetuate violence on the basis of perceived sex.

Drawing on the framing of Chung and Rimal (2016), the existence of a social norm is evidenced by the presence of one or both of the descriptive norm and the injunctive norm. A descriptive norm is a perception about whether others in their reference group engage in certain activities; in other words, descriptive norms are what people think is typical behavior. Injunctive norms, on the other hand, address pressure to conform to avoid sanctions or other negative consequences, or to gain approval; in other words, injunctive norms are what people think others consider acceptable (Cialdini et. al., 1991). Personal beliefs are an additional component of belief systems, which are characteristics of and measured at the individual level. It is important to consider this aspect, as personal beliefs may change more quickly than norms.

Methods

Data collection

We use data collected as part of the *C'est La Vie*! impact evaluation conducted in the Kaolack region in central Senegal, and the Kolda region in the south of Senegal (Dione et al., 2023). The baseline data were collected in October to December 2019 and a follow-up approximately 12 months later in December 2020 to January 2021. Study villages were randomly selected from among all villages in each region with the following characteristics: 500 households or fewer, at least 34 adolescent girls and young women in the target age range, a government primary school present, and accessible by motor vehicle. Prior to the baseline survey, a census was conducted in all study villages of identifying eligible adolescent girls and young women. Eligibility criteria included: 1) age (14-34 years), 2) speaking and understanding the primary local language in the region (either Wolof or Pulaar), and 3) living within a two-kilometer radius of the primary school. A random sample of 34 eligible adolescent girls and young women was selected in each village to take part in the study. The baseline survey included a household survey, typically administered to the household head and an individual survey with the target adolescent girl or

young woman. At both timepoints, data were collected on injunctive norms and personal beliefs related to violence against women and girls using the Social Norms and Beliefs about GBV Scale (Perrin et al., 2019). The surveys also include a wide variety of outcomes related to knowledge, attitudes, and behaviors across violence against women and girls and sexual and reproductive health outcomes.

Measuring injunctive norms and personal beliefs

The Social Norms and Beliefs about GBV scale was originally, developed for use in high-conflict and humanitarian crises, based on formative work in South Sudan and Somalia (Perrin et al., 2019). For both the injunctive norms and personal beliefs, we included two of the subscales in our surveys: Response to Sexual Violence (to capture the theme of NPSV) and Husband's Right to Use Violence (to capture the theme of IPV). We did not include the Protecting Family Honor subscale, which focused on NPSV, as the intervention being studied had fewer themes around NPSV and thus we expected impacts would be similar to the Response to Sexual Violence scale.

To measure injunctive norms, the questions ask, "How many of the people whose opinion matters most to you think/expect…" and offer five response categories: i) of none of them, ii) a few of them, iii) about half of them, iv) most of them, and v) all of them. In measuring personal beliefs, for a similar set of scenarios, respondents indicate whether they: i) agree, ii) not sure if they agree or disagree, iii) disagree but not ready to tell others, iv) disagree and ready to tell others that this is wrong. (The exact wordings are provided when we report the factor loadings in Table 2.) For the follow-up response categories for personal beliefs, based on feedback from baseline data collection, we divided the question into two parts. First, respondents were asked if they agreed, disagreed, or were not sure. Those that disagreed were then asked whether they were ready to tell others that this is wrong. These were coded as a single response scale to correspond to the baseline categories, and we address potential concerns about this approach when we test for measurement invariance.

Assessing psychometric validity

After a descriptive review of the data (e.g., means, correlations), we used factor analysis to explore the dimensionality of the data. We first conducted exploratory factor analysis (EFA) on a randomly selected half of the baseline data.[1] We conducted EFA separately for the injunctive norms items and personal belief items. Scree plots and Eigenvalues were used to inform decisions about how many factors to retain and both orthogonal (varimax) and oblique (oblimin) rotations were considered to identify simple structure in which each item loaded on a single factor. Items that loaded on multiple factors of <0.4 were dropped.

We then used confirmatory factor analysis (CFA) to assess how well the remaining half of the data set fit the structure proposed by EFA and provide support that EFA did not reach this structure by chance. Model fit was assessed using the comparative fit index (CFI), the Tucker−Lewis

[1] Although we were working within an established scale, which would typically justify being able to proceed directly to CFA, the scale was initially developed for a different cultural context that was experiencing a high degree of insecurity and violence. Therefore, we began our analysis with EFA.

index (TLI), and the Standardized Root Mean Square Residual (SRMSR). All three test statistics range from 0 to 1. For the CFI and TLI, >0.95 is considered good and >0.90 adequate. For the SRMSR, <0.05 is good and <0.08 is adequate.

To determine whether the construct were similar between adolescents and adults, between the Wolof and Pulaar speaking populations, and between survey waves, we tested for measurement invariance using multigroup CFA (MGCFA) (Milfont & Fischer, 2010; Putnick & Bornstein, 2016). To compare across age and language groups, we compared the structure using the baseline data. To compare across time, we compared the baseline and follow-up data. We tested five different levels of measurement invariance: (1) Configural invariance: same pattern of item loadings (factor structure) across groups. (2) Weak, or metric, invariance: equal factor loadings across groups. (3) Strong, or scalar, invariance: equal factor loadings and item intercepts across groups. (4) Strict, or residual, invariance: equal factor loadings, item intercepts and residual variances (sum of item-specific variance and error variance) across groups, and (5) Mean invariance: equal factor loadings, item intercepts, residual variance and latent factor means across groups. Scalar invariance is adequate for comparing mean differences among latent constructs and for our needs (Putnick & Bornstein, 2016).

Results

Sample description

Table 1 provides descriptive characteristics of the sample. The average age of the respondents was 22.6 years, and approximately 38% of the respondents were aged 14 to 19 years. Around half of women in the sample were monogamously married at the time of the baseline survey, while 21.2% were polygynous and 27.3% had never been married. Approximately half had never attended school; one-fourth had attended or completed primary school; and one-fourth had completed are attended secondary school. Almost half of the sample was from the Pulaar ethnic group, and 31% was from the Wolof ethnic group. The average household size was 10 people.

Table 1: Sample characteristics

	Mean
Age (years)	22.604
Age (14-19 years)	0.377
Age (20-24 years)	0.230
Age (25-29 years)	0.198
Age (30-34 years)	0.193
Marital status: Never married	0.273
Marital status: Married monogamous	0.498
Marital status: Married polygamous	0.212

Marital status: Separated, divorced or widowed	0.016
Education: Never attended school	0.514
Education: Completed or some primary	0.237
Education: Completed or some secondary	0.249
Ethnicity: Pulaar	0.447
Ethnicity: Wolof	0.310
Ethnicity: Mandingue, Diola, Soninke, or other	0.241
Household size	10.011

Source: Authors' calculations. N=3959.

Exploratory and confirmatory factor analysis

Error! Reference source not found. presents the results of the EFA (left-hand columns) and CFA (right-hand columns). The EFA results revealed two factor models for both injunctive norms and personal beliefs that were largely consistent with the domains found by Perrin and colleagues. One exception was that the item on a man's right to demand sex from a woman who is not his wife, had factor loadings below the 0.4 cutoff of both factors. After dropping this item and conducting a promax (oblique) rotation, simple structure was achieved. For the injunctive norms, the first factor measures husbands' right to use violence and includes items on husbands' right to and motivations for physically punishing his wife, as well as his right to sex. The second factor describes the response to sexual violence by husbands and others. The two different CFA models for the injunctive norms factors fit well and all items loaded well within each factor.

The EFA results for the personal belief items also revealed a two-factor model in which simple structure was achieved following a promax (oblique rotation) (**Error! Reference source not found.**). The two factors describe husbands' right to violence and responses to sexual violence. All items were retained. The CFA models for personal beliefs also fit well, and the items also loaded well.

Table 2: Result of exploratory and confirmatory factor analysis

	Exploratory factor analysis		Confirmatory factor analysis	
Injunctive norms				
	Factor 1: Husband's right to use violence	Factor 2: Response to sexual violence	Factor 1: Husband's right to use violence	Factor 2: Response to sexual violence
1. Expect a husband to abandon his wife if she reports that she has been raped	--	0.8239		0.805***

2. Expect the family to ignore/reject a daughter if she reports that she has been raped	--	0.8420		0.803***
3. Accept sexual violence against women and girls a normal part of life	--	0.4390		0.596***
4. Blame women/girls when they are raped	--	0.4846		0.660***
5. Think that a man should have the right to demand sex from a woman or girl even if he is not married to her[1]	--	--	--	--
6. Think that when a man beats his wife, he is showing his love for her	0.6862	--	0.798***	
7. Think that a man has the right to beat/punish his wife	0.8693	--	0.921***	
8. Think it is okay for a husband to beat his wife to discipline her	0.8760	--	0.882***	
9. Expect a husband to force his wife to have sex when she does not want to	0.6580	--	0.694***	
Sample size and model fit		N=2035	N=2033 RMSEA=0.072 CFI=0.973 TLI=0.919	N=2033 RMSEA=0.059 CFI=0.966 TLI=0.898
Personal beliefs				
	Factor 1: Husband's right to use violence	Factor 2: Response to sexual violence	Factor 1: Husband's right to use violence	Factor 2: Response to sexual violence
1. Husbands should abandon/reject/divorce their wife if she reports that she has been raped	0.746		0.799***	
2. A man should have the right to demand sex from a woman or girl even if he is not married to her	0.710		0.789***	
3. A woman/girl would be stigmatized if she were to report sexual violence	0.752		0.823***	
4. A woman/girl should be blamed when she has been raped	0.792		0.868***	
5. Sexual violence against women and girls should be accepted as a normal part of life	0.579		0.611***	
6. Families should ignore/reject a daughter if she reports that she has been raped	0.827		0.861***	

7. It is okay for a husband to beat his wife to discipline her	0.8668		0.882***
8. When a man beats his wife, he is showing his love for her	0.7141		0.839***
9. A man has the right to beat/punish his wife l	0.9014		0.907***
10. A husband should force his wife to have sex when she does not want to	0.6393		0.728***
Sample size and model fit	N=2035	N=2034 RMSEA=0.052 CFI=0.960 TLI=0.934	N=2034 RMSEA=0.066 CFI=0.986 TLI=0.957

Source: Authors' calculations

Note: Sample sizes are from a randomly selected half of the dataset for the EFA and the second half for the CFA. For both injunctive norms and person beliefs, the results report a promax (oblique) rotation. Question stem for the injunctive norms question is "How many of the people whose opinion matters most to you…" RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI= Tucker-Lewis Index

[1] Factor loading <0.4, dropped from reported EFA and CFA models.

Measurement invariance tests

Table 3 presents the results of the measurement invariance test. The three sets of columns show results for each set of comparisons (language, age, and time). The first set of rows shows model fit for the baseline models, and the subsequent rows show the results of increasingly stricter levels of measurement invariance. Overall, we find strong evidence of measurement invariance across age groups and across time (despite minor changes in how the survey item was structured across surveys). The scale achieves mean invariance by age group and strict or residual invariance across survey wave. Importantly, this suggests, that these scales can be used to compare differences in adolescent girls and young women and to compare differences across time. There is somewhat weaker support for invariance by language group, as only strong factorial invariance was achieved. This may reflect differences in how common phrases are interpreted. It may also reflect differences between the ethnic groups in terms of the meanings of certain behaviors. Nevertheless, by common standards, even this level of invariance is adequate for comparisons of effects between language groups (Putnick & Bornstein, 2016).

Table 3: Test of measurement invariance across language groups, age groups, and survey wave

	Invariance across language groups				Invariance across age groups				Invariance across time			
	Injunctive norms		Personal beliefs		Injunctive norms		Personal beliefs		Injunctive norms		Personal beliefs	
	Model 1	Model 2[1]	Model 1[2]	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model1	Model 2
Baseline models	-	-	-	-								
CFI	0.983	0.995	0.991	0.992	0.983	0.995	0.991	0.992	0.987	0.990	0.992	0.992
TLI	0.950	0.985	0.984	0.977	0.950	0.985	0.984	0.977	0.961	0.971	0.986	0.976
SRMR	0.021	0.014	0.019	0.017	0.021	0.014	0.019	0.017	0.018	0.016	0.018	0.019
X2(df)	32.511 (2)	18.004 (2)	82.833 (2)	42.944 (2)	32.519 (2)	18.004 (2)	82.833 (9)	42.944 (2)	55.279 (2)	57.204 (2)	84.028 (9)	62.159 (2)
Configural invariance (weak factorial)												
CFI	0.977	0.995	0.980	0.991	0.982	0.995	0.980	0.991	0.987	0.990	0.985	0.994
TLI	0.930	0.985	0.967	0.974	0.947	0.986	0.96	0.974	0.961	0.970	0.974	0.981
SRMR	0.019	0.013	0.023	0.014	0.018	0.012	0.017	0.014	0.016	0.015	0.021	0.014
X2(df)	48.128 (4)	22.059 (4)	171.557 (18)	49.036 (4)	36.451 (4)	18.856 (4)	171.557 (18)	49.036 (4)	62.769 (4)	67.150 (4)	171.329 (18)	54.345 (4)
Weak Invariance (metric)												
CFI	0.987	0.981	0.986	0.979	0.992	0.998	0.995	0.996	0.980	0.990	0.978	0.987
TLI	0.978	0.968	0.982	0.965	0.986	0.997	0.994	0.993	0.966	0.982	0.972	0.978
SRMR	0.022	0.035	0.026	0.031	0.019	0.013	0.019	0.015	0.030	0.023	0.039	0.026
X2(df)	31.573 (7)	75.691 (7)	131.116 (23)	112.375 (7)	21.929 (7)	12.642 (7)	61.096 (23)	*28.498 (7)*	96.050 (7)	71.336 (77)	*237.653 (23)*	105.379 (7)
Strong factorial (scalar)												
CFI	0.930	0.981	0.985	0.959	0.988	0.996	0.995	0.995	0.959	0.977	0.961	0.969
TLI	0.916	0.974	0.983	0.951	0.986	0.995	0.995	0.994	0.951	0.973	0.958	0.963

SRMR	0.040	0.036	0.027	0.041	0.021	0.016	0.019	0.017	0.038	0.030	0.048	0.038
X2(df)	141.238 (10)	79.526 (9)	142.077 (26)	219.854 (10)	31.079 (10)	23.815 (10)	63.269 (28)	38.027 (10)	195.983 (10)	151.746 (10)	418.906 (28)	249.515 (10)
Strict or residual invariance												
CFI	0.876	0.970	0.965	0.945	0.989	0.996	0.996	0.994	0.928	0.971	0.913	0.933
TLI	0.894	0.972	0.968	0.953	0.991	0.997	0.996	0.995	0.938	0.975	0.923	0.942
SRMR	0.083	0.058	0.055	0.058	0.029	0.021	0.022	0.022	0.066	0.043	0.087	0.067
X2(df)	246.499 (14)	122.774 (13)	300.407 (32)	295.366 (14)	33.188 (14)	27.321 (14)	66.671 (34)	46.240 (14)	342.307 (14)	197.358 (14)	905.770 (34)	535.931 (14)
Mean invariance												
CFI	0.901	0.961	0.934	0.944	0.992	0.996	0.994	0.997	0.862	0.959	0.665	0.871
TLI	0.876	0.966	0.940	0.955	0.994	0.997	0.995	0.998	0.889	0.967	0.713	0.897
SRMR	0.089	0.069	0.072	0.075	0.030	0.024	0.027	0.022	0.090	0.057	0.146	0.103
X2(df)	249.021 (15)	157.910 (14)	541.872 (33)	302.108 (15)	29.679 (15)	28.239 (15)	84.365 (35)	29.271 (15)	642.988 (15)	273.305 (15)	3376.614 (35)	1015.557 (15)

Source: Authors' calculations

Notes: N=2035. Analysis was completed on the same randomly selected half used to conduct the CFA. CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standardized Root Mean Squared Residual, df = degrees of freedom

[1] Partial invariance achieved in the strong factorial, by relaxing constraint in intercepts of item *"beats his wife to show love for her."*

[2] Partial invariance achieved in the strong factorial, by relaxing constraint in intercepts of items *"right to demand sex even if not married"* and *"sexual violence is a normal part of life."*

Conclusion

We conduct EFA and CFA to identify the dimensionality of select subscales that measured injunctive norms and personal beliefs about Response to Sexual Violence and Husband's Right to Use Violence from the Social Norms and Beliefs about GBV scale (Perrin et al., 2019). The scales had been developed for contexts experiencing high conflict and humanitarian crises, and our work helps establish their validity for use in a non-conflict setting with a lower prevalence of IPV and GBV, where there are not yet validated approaches to measuring norms and beliefs about GBV. Overall, the findings support a factor structure that is relatively similar to the original scales, with the exception of one item measuring injunctive norms about a man's right to sex with a woman or girl to whom he is not married, which did not load well on either factor. This difference may be attributable to differences in the study settings or study samples (we administered the instrument to adolescent girls and young women).

Additionally, findings from the MGCFA, which was conducted to determine whether the factor structures are comparable across different groups, suggest strong measurement invariance across age group and survey waves. These findings suggest that these scales can be used to compare differences in adolescent girls and young women and to compare differences over time in multi-wave surveys. There is weaker, but adequate support, for comparisons across language groups, which suggests room to improve the subtlety of interpretation and meaning to ensure consistency across ethno-linguistic groups.

These psychometric results give us confidence that, with minor revisions, the subscales we tested are valid for use with adolescent and young women in Senegal and can be used to assess change over time. This evidence is important for establishing the usability of the scale in additional settings. Such tools will help generate further evidence on how norms and beliefs relate to GBV and the types of interventions that may help change norms and beliefs about GBV.

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