



# Adapting and Validating the G-NORM (Gender Norms Scale) in Nepal: An Examination of How Gender Norms Are Associated with Agency and Reproductive Health Outcomes

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*Research calls for the sexual and reproductive rights field to prioritize gender norms to ensure that women can act on their reproductive rights. However, there is a gap in accepted measures. We addressed this by including important theoretical components of gender norms: differentiating between descriptive and injunctive norms and adding a referent group. Our team originally developed and validated the G-NORM, a gender norms scale, in India. In this paper, we describe how we subsequently adapted and validated it in Nepal. We administered items to women of reproductive age, conducted exploratory and confirmatory factor analysis, and examined associations between the subscales and reproductive health outcomes. Like the original G-NORM, our factor analyses showed that descriptive norms and injunctive norms comprise two distinct scales which fit the data well and had Cronbach alphas of 0.92 and 0.89. More equitable descriptive gender norms were associated with higher decision-making scores, increased odds of intending to use family planning, disagreeing that it is wrong to use family planning, and older ideal age at marriage. Injunctive gender norms were only associated with disagreeing that it is wrong to use family planning. Findings offer an improved measure of gender norms in Nepal and provide evidence that gender norms are critical for agency and reproductive health outcomes.*

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## INTRODUCTION

Inequitable gender norms result in women having fewer educational and professional opportunities and less autonomy regarding sex, marriage, and reproductive decision-making (Starrs et al. 2018; Namasivayam et al. 2012; Blanc 2001). Recent research has drawn attention to the far-reaching effects of inequitable gender norms on women's health and economic development, motivating leaders in 2015 to incorporate gender equity into the United Nations Sustainable Development Goals (SDGs). Gender norms are a subset of social norms that

describe how people of a particular gender are expected to behave, in a social context. They are embedded within institutions and reinforced through social interactions (Cislaghi and Heise 2019). Inequitable gender norms operate at both formal and informal levels to restrict female autonomy and access to resources, as well as to perpetuate harmful practices and human rights violations, such as gender-based violence, child marriage, and dowry (United Nations Human Rights, 2023). Studies have found female empowerment and agency to be associated with fertility desires (Upadhyay et al. 2014) and health care use (Allendorf 2007), while equitable beliefs about gender relations can serve as drivers of family planning use (Wegs et al. 2016).

According to the Theory of Normative Social Behavior (TNSB; Rimal and Real 2005), our basic human desires to belong and to connect lead us to care a great deal about what we perceive people in our community *are* doing (descriptive norms) and what we believe they think we *should* be doing (injunctive norms) (Rimal and Lapinski 2015). The distinction between descriptive norms, individuals' beliefs about others actions (e.g., that most parents in the community pay a dowry for their daughter's marriage), and injunctive norms, individuals' beliefs about what others expect them to do (that they *should* pay a dowry when their daughter is married), is a critical feature of social norms theory (Cialdini et al. 1991). Descriptive norms serve to identify perceptions of behavior, whereas injunctive norms serve to motivate behaviors to seek social rewards or avoid sanctions (Rimal and Real 2005).

Women's empowerment is a key component of their autonomy to make reproductive decisions (Jejeebhoy 2002). A recent UNFPA report stated that gender equality is the "neglected crisis of unintended pregnancy (UNFPA 2022)." One framework for conceptualizing women's empowerment outlines the interconnectedness of three spheres that interact to help women experience empowerment: (1) agency (including decision-making); (2) resources (including health); and (3) institutional structures (including norms) (Bill and Melinda Gates Foundation, 2018). Gender norms (and other social norms) are thought to influence women's sense of agency and decision-making ability (Boudet et al. 2013). Work by Srilata Batliwala in South Asia has shown that gender norms are stubborn but not immutable (Batliwala 2015). A host of research has suggested that gender, gender norms, and gender roles/relationships are associated with family planning use in Nepal, as well as elsewhere (Mahato et al. 2020). A review (which included measures of agency and were mostly from South Asia) found that women's empowerment was often associated with fertility desires, unintended pregnancy,

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abortion, and other related preferences, although some evidence was mixed (Upadhyay et al. 2014). Previous qualitative work in India has found that social and gender norms are associated with the ideal age at marriage, which is on the pathway to early childbearing and higher longer-term fertility (Maertens 2013). There is also a large body of evidence in South Asia supporting the importance of norms in relation to early marriage (Chae and Ngo 2017; Gage 2013; Raj et al., 2014; Karim, Greene, Picard 2016; Raj 2010). Other research in India has found that social and gender norms influence the ideal gap between marriage and first birth, which also influences overall fertility (Basu 1993).

Women's agency has been found to be associated with other forms of health care use in Nepal and India as well (Namasivayam et al. 2012; Allendorf 2007). Of note, a recent systematic review of measures of empowerment and gender used in interventions about family planning and maternal health found that only a minority of these interventions actually measured the impact of gender on these outcomes (Mandal et al. 2017). Additionally, a mixed-methods study in Kenya found equitable beliefs about gender relations to be one of the strongest predictors of family planning use among men, while variables indicative of empowerment, such as self-efficacy for family planning and control over household assets, were positive predictors of family planning use among women (Wegs et al. 2016). Given this, there have been calls from the Lancet–Guttmacher Commission, and others, to further elucidate how gender norms are related to family planning use and to incorporate norms into family planning program design (Galavatti and Gullo 2022; Starrs et al. 2018; Skinner et al., 2021).

## Gaps in Gender Norms Measurement

As gender equality gains recognition as a public health priority, more studies seek to measure gender norms as an important outcome, as well as a barrier to or facilitator of behavior change. Recently, there have been calls to improve gender norms measurement. The United Nations Women (2018) reported that most of the Sustainable Development Goal indicators do not have accepted methodologies for measurement and data. This assessment suggests notable measurement gaps in general, including gender equality. Specifically, many researchers are measuring individual beliefs, attitudes, and behavior without recognizing referent groups, which are necessary to truly measure norms (a social phenomenon) (Geeta 2011; EMERGE 2018). There are two relatively new scales that measure both descriptive and injunctive gender norms among adolescents only (Baird et al 2019; Moreau et al. 2019). However, common measurement tools among adults miss this critical distinction between personal to collective belief systems. For instance, the widely used Gender Equitable Men (GEM) scale measures individual attitudes about gender roles (e.g., that women's most important role is to take care of their home and cook) and captures inequitable beliefs but fails to incorporate questions regarding others' perceptions of a given attitude or behavior, thus neglecting the role of social norms. A principle of social norms theory is that, in a social context, people act based on what they believe is acceptable to their referent groups in their community (Rimal and Lapinski 2015). Additionally, most existing scales, such as the Sexual Relationship Power Scale, focus on specific constructs within gender norms. While these scales are necessary to the field, they do not allow researchers to understand larger gender norms which may be related to sexual

and reproductive health outcomes, such as decision-making, working outside the home, and mobility (Pulerwitz, et al. 2000).

This study extends the extant gender norms measurement tools to adapt and validate the G-NORM, a 20-item scale that measures perceptions of community-level gender norms (and includes both descriptive and injunctive norms as two subscales) in rural Nepal. While this scale was originally tested in rural India (See Sedlander et al., 2022), its external validity needs further testing; the current paper does so in Nepal. It also demonstrates construct validity by examining the scale's association with several sexual and reproductive health-related constructs.

## METHODS

The data used to adapt and validate the G-NORM scale come from the last wave of a longitudinal study examining nutrition and gender empowerment among newly married women in the Nawalparasi district in Nepal (Diamond-Smith et al. 2020; Diamond-Smith et al. 2020; Diamond-Smith et al. 2020). This region is in the Terai, a southern stretch of Nepal at a low altitude and bordering India. It is more socially disadvantaged, compared to other rural areas in Nepal, and the status of women, including household decision-making, is lower in this area (Acharya et al. 2010; Ministry of Health, Nepal, 2017). The G-NORM measures were collected in the fourth round of data collection (18 months post-baseline) as part of the longitudinal study on newly married couples. The G-NORM scale was added in round 4 to validate it in a new population and since this was an observational longitudinal study (no intervention), we do not think that the prior rounds of data collection could have biased responses to the G-NORM. At baseline, women were eligible if they had been married within the last four months, were 18–25 years old, and were currently co-residing with their mother-in-law. The sample for this study represents 93 percent of the original sample ( $n=187$ )—7 percent was lost to attrition. At the time the G-NORM was asked, 86 percent were still living with their mother-in-law.

This study was approved by the Nepal Health Research Council of Nepal and the Institutional Review Board of the University of George Washington University in the United States. Written informed consent was obtained from all participants.

## Scale Development

We adapted and validated the gender norms scale in four stages: (1) formulation of new questionnaire items for the scale based on analysis of qualitative data from the Nepali study communities, review of the literature, and expert input; (2) cognitive interviewing with draft questionnaire items; (3) determining the dimensionality of the scale and identifying and removing poorly performing items by applying *exploratory factor analysis*; and (4) validation of the scale by applying *confirmatory factor analysis*, and examining associations with outcomes hypothesized to be associated (e.g., decision-making around family planning and intent to use family planning in the future).

## FORMULATION OF THE SCALE ITEM POOL

### Qualitative Data Collection and Analysis

To ensure that the prior items from India and the new items that we developed were relevant to the Nawalparasi district, we first analyzed qualitative data collected from the community in the same district. The qualitative research was conducted in 2017 in efforts to understand the concerns and experiences of marriage, fertility, and health in households of newly married couples and to inform our study examining nutrition and gender equality among newly married women. Sixty in-depth interviews were conducted with newly married women, their husbands, and mothers-in-law (20 intact triads). This was a different group of women than were recruited into the longitudinal study described below, since eligibility for both groups was being within four months of marriage. See (Diamond-Smith et al., 2020) for a full description of the qualitative data collection methods. Four of the authors analyzed in-depth qualitative interview transcripts.

### Qualitative Results

We found that many of the inequitable gender practices that we identified in India were also relevant in Nepal, which was not surprising given their geographic proximity and sociocultural similarity. We also identified additional inequitable norms that were linked to contraceptive autonomy around the use of family planning methods, decision-making about when to have the first child, and decision-making around the total number of children to have. Other inequitable gender practices that we identified were parents choosing whom their daughter would marry (an arranged marriage) and parents paying a dowry when their daughter gets married. Dowry is a financial and/or material arrangement to be given by the parents of the bride to the parents of the groom as a necessary condition of the marriage in some South Asian cultures. Although dowry is illegal, our findings showed that it was common in this area (Diamond-Smith et al. 2020) and this is in line with a recent UN Report, Gender Equality Update 25: Covid 19 and Harmful Practices in Nepal, 2021. Based on these qualitative data and input from Nepali researchers in the gender norms field who have worked extensively in these communities, we added 10 new items. One researcher from the Center for Research on Environment, Health, and Population based in Kathmandu, Nepal translated the English questions into Nepali. They were subsequently cross-checked with two other bilingual researchers.

### The Measure

To improve clarity and to reduce analysis errors, we wrote all questions in the same direction representing inequitable gender norms. Based on expert feedback, all questions referred to one referent group (the community). We wrote two versions of each question, one assessing descriptive norms and the other assessing injunctive norms. Response options included a 5-item Likert scale: “strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.” Specifically, 1 corresponds to strongly agreeing that women do or should enact an inequitable gender norm and 5 strongly disagrees with this statement. Higher scores = more equitable gender norms.

## Item Adaptation: Contextualization and Cognitive Interviews

First, we translated all items from English to Nepali and checked the translation with multiple researchers. We included a total of 28 items—all 18 items from the original G-NORM and 10 new items that we developed for this context (Table 2). One researcher traveled to Kathmandu to conduct an in-person cognitive interview training with two other researchers, both of whom had edited the previously translated items together to ensure that they were accurately capturing the same message during the translation process. For example, they discussed how to describe the difference between descriptive and injunctive norms. They came up with a relevant example to describe injunctive norms (expectations):

“For example, maybe in this community everyone knows that they *should* wash their hands with soap and water before they eat but they don’t do it every time. In the same way, I will ask you questions about what the community *expects*, not what is actually done.”

We then conducted 14 cognitive interviews in the same two areas where the parent study took place (Palhinandan rural municipality and Suwal urban municipality in Nawalparasi district) to ensure that the scale items were relevant and comprehensible. Two Nepali researchers conducted the interviews face-to-face in women’s homes or outside in a private location near their homes. For the cognitive interviews, to ensure that the scale would work in a larger group of women, we decided to include all women of reproductive age (range 21–47 years old). Before each interview, participants were asked if they were more comfortable speaking Nepali or Awadhi, the local language. Six interviews were conducted in Awadhi and nine were conducted in Nepali. One interviewer was fluent in both the Nepali and Awadhi languages, and she translated the questions into Awadhi. Interviews were conducted face-to-face, and data were entered on computer-assisted personal interviews using tablets and KoBo Toolbox version Va.14.0a.

Interviews consisted of asking scale items one at a time and pausing after each question/item to ask participants to describe how and why they arrived at their answer, and whether the item was confusing or difficult to respond to. Interviewers took hand-written notes for each item on participants’ reasoning behind the answer they selected, inconsistencies in their response to that item compared to similar items, and participants’ reflections on how easy or difficult it was to answer the item. The field research team met after each interview to debrief and revise items that did not work well in real-time to ensure consistent interpretation and clarity of items. We made minor changes in Nepali, ensuring that items still captured the essence of the statement. Specifically, we replaced “more educated” and “women obey their husbands in all matters” with a simplified translation and we added a synonym to the word “dowry” because women use multiple words to refer to this practice.

## Questionnaire Administration

### *Inclusion Criteria*

In Nov–Dec 2019, 187 newly married women defined as married within the last four months, residing with husband and mother-in-law, and between 18 and 25 years old at the time of baseline enrollment took the survey (these data were collected 18 months post-baseline).

## **Psychometric Analysis**

To understand the scale's psychometric properties, we examined the distributions and correlations of all items. To explore the variability of responses, we also examined the range, mean, and standard deviation of each item in our pool (DeVellis 2017). Next, following Vu et al. (2017), and given that we added new items to reflect the Nepali context, we chose to start with exploratory factor analysis (Vu et al. 2017). This allowed us to determine the dimensionality of the scale and to identify and remove poorly performing items. We created a scree plot of the eigenvalues to determine the number of factors, retaining factors that had eigenvalues of 2 or above. Factors that have an eigenvalue just over 1 are only slightly better than one item by itself (DeVellis 2017, 166). We also visually inspected the scree plots to ensure that we extracted the correct number of factors. These analyses suggested a two-factor solution. We then reran the exploratory factor analysis constraining the number of factors to two. There was no reason to assume the two factors would be uncorrelated, so we used an oblique promax rotation and obtained the standardized factor loadings from this solution. Next, following Comrey and Lee's guidelines, we evaluated loadings on each factor and individually removed one item at a time that had a factor loading of less than 0.4, starting with the item with the lowest factor loading and moving to the item with the next lowest loading, and so on until all remaining items had factor loadings of 0.4 or higher (Comrey and Lee 1992) (Table 2). We stipulated that items must be removed in pairs (i.e., if the injunctive norm item involving a certain behavior is removed, the corresponding descriptive norm item must also be removed, and vice versa). The rationale for this, which is more fully explicated in prior work on the development and validation of this scale in India (See Sedlander et al., 2022), involves the interaction of social norms theory, particularly the TNSB (Rimal and Lapinski 2015; Rimal and Real 2005), and contemporary approaches to the sociology of gender. As noted above, the distinction between descriptive versus injunctive norms is a key element of the TNSB. Fundamental to recent sociological scholarship on gender is the conceptualization of gender roles as consisting of a constellation of gender-specific prescribed and proscribed behaviors that are maintained (and change) through social interaction (Ridgeway and Correll 2004; Risman 2004). There is no reason to believe that the constellation of prescribed and proscribed behaviors that define gender roles in a particular sociocultural context would be substantially different for assessing perceived descriptive norms versus perceived injunctive norms. As exploratory factor analysis is a data reduction technique, this approach enabled us to create a more parsimonious scale. Table 2 shows the original pool of all 28 items with factor loadings for each subscale and the final items that remained after Exploratory Factor Analysis (EFA).

## **Scale Validation**

We conducted four sets of analyses to validate the G-NORM in this new context. First, as previously discussed, we conducted an exploratory factor analysis to examine if the same two-structure model held in this new context.

Second, we conducted confirmatory factor analyses to evaluate the fit of the two-factor model suggested by our exploratory factor analyses. In these analyses, we first imposed the assumption of conditional independence, that is, all covariation between the items is

attributable to the underlying factor or factors being measured. We then relaxed this assumption, first by allowing the errors/uniquenesses of analogous descriptive norms and injunctive norms items (e.g., items 1 and 14, items 2 and 14, and so on) to be correlated, and subsequently allowing for additional correlations between errors/uniquenesses as suggested by modification indices. Thus, we compared a total of three two-factor models: (1) no correlated errors; (2) error correlations between analogous pairs of items; and (3) error correlations between analogous pairs of items plus correlations between the errors on items 23/24, 14/28, 9/10, 10/11, and 9/11. The additional error correlations were suggested by modification indices and also made sense theoretically based on the similarity of the items (e.g., items 31 [Husbands *should* have the final say about when to start trying to have their first child] and 32 [Husbands *should* make the final decision about the total number of children they want] are correlated). To examine model fit, we used the model chi-squared, the Bentler Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), Standard Root Mean Square Residual (SRMR), Aikake Information Criteria (AIC), and Bayesian Information Criteria (BIC). We conducted all analyses in Stata 17.0.

Third, to provide additional evidence for the validity of the scale, we used regression models to test hypotheses about how the G-NORM would be associated with sexual and reproductive health-related attitudes and measures of empowerment/agency. The first variable was a decision-making score, combining three of the commonly used questions about if women made decisions on their own, jointly with their partner, or were not involved about (1) health care use; (2) household purchases; and (3) children's education. Each item was coded as 1 if she was involved (solely or jointly) and 0 if not involved, and then a summative score was created combining all three items (the score could range from 0 to 3). Next, we looked at the association of the G-NORM and whether a woman stated that she intended to use family planning in the future (binary: yes or no/not sure). We chose to use intention rather than actual contraception use because almost a third of the sample (young and recently married women) were pregnant or breastfeeding and most who were not pregnant wanted to become pregnant in the near future. We then looked at the association of G-NORMs with her response to a question about if it was “wrong to use contraceptives or other means to delay or avoid pregnancy” with the answer choices being strongly agree, agree, neutral, disagree, or strongly disagree, recoded as a binary of strongly disagree (0) compared to all others (1) because the strongly disagree was the majority response. The final two outcomes explored were continuous measures of her stated (1) ideal age of marriage (continuous) and (2) ideal gap between pregnancy and the first birth (continuous). To test these hypotheses, we ran linear or logistic regression models controlling for age (continuous), education (categorical: no school, <6 years of school, 6–12 years of school, more than 12 years of school), caste (categorical from less to more marginalized: Brahmin/Chhetri, Janajati/Terai Janajati, Dalit/tarai Dalit/Muslim/Other), love versus arranged marriage (binary with arranged=1 and love=0), religion (Non-Hindu [1] compared to Hindu [0]), husbands age, ever given birth or currently pregnant (compared to neither), and household wealth quintile. These covariates were selected based on previous literature about them being associated with gender norms and reproductive health outcomes (Mosha et al. 2013; Jejeebhoy 2002; Sanneving et al. 2013).



**TABLE 1** Description of the sample (N=187)

<b>Age mean (SD)</b>	22.21 (1.98)
<b>Education (%)</b>	
No school	8 (4.0%)
Completed up to grade 5	25 (12.5%)
Completed grade 6 to 12	137 (68.5%)
Completed more than grade 12	30 (15.0%)
<b>Religion</b>	
Hindu	172 (86%)
Non-Hindu	28 (14.0%)
<b>Caste/ethnicity</b>	
Brahmin/Chheetri	41 (20.50%)
Janajati (indigenous)	106 (53.00%)
Dalit/Muslim/Other	53 (26.50%)
<b>Type of marriage</b>	
Love	59 (29.50%)
Arranged	141 (70.5%)
<b>Ever used contraception</b>	
Yes	121 (64.71%)
No	66 (35.29%)
<b>Currently pregnant or given birth</b>	
Yes	148 (79.14%)
No	39 (20.86%)
<b>Husband age mean (SD)</b>	23.9 (2.9)
<b>Husband education</b>	
Completed up to grade 5	22 (11.00%)
Completed grade 6 to 12	148 (74.00%)
Completed more than grade 12	30 (15.00%)
<b>Decision-making score (higher is more decision-making power)</b>	
0	145 (72.50%)
1	42 (21.00%)
2	12 (6.00%)
3	1 (0.50%)
<b>Intend to use family planning in the future</b>	
Yes	157 (83.96%)
No	30 (16.04%)
<b>Wrong to use contraception</b>	
Strongly disagree	122 (65.24%)
All other responses	65 (34.76%)
<b>Ideal first gap</b>	
1 year	9 (4.81%)
2 years	136 (72.73%)
3 years	42 (22.46%)
<b>Ideal first age at marriage mean (SD)</b>	21.49 (1.96)

Additionally, we ran a Pearson correlation test to show how associated the two subscales, descriptive and injunctive norms, were. We also described how the scale performed differently across subgroups, with mean and standard deviations for both subscales, and how they vary by education and caste (Table 4). Finally, we reversed-scored the items to improve interpretability (higher scores = more equitable gender norms).

## RESULTS

### Descriptive Statistics

Table 1 provides a description of the 187 newly married women aged 18–25 whose survey data contributed to the psychometric analysis. The mean age was 22.21 years old (SD= 1.98) and education levels ranged from no formal schooling (4.0 percent) to beyond class 12 (15.0

percent), with most women completing up to grade 12 (68.5 percent). Most women were Hindu (86 percent), while the remaining 14.0 percent described themselves as Muslim, Christian, and Buddhist. Over half of the women belonged to the Janajati/Terai Janajati caste (53 percent), while 26.5 percent belonged to Dalit/taari, Dalit/Muslim/Other, and 20.5 percent belonged to Brahmin/Chheetri. The majority of marriages were arranged (70.5 percent) and most women had one or two children or were currently pregnant (79.14 percent), while the remainder were childless. Husbands had a mean age of 23.9, and most had completed grade 6–12 (74 percent) or more than grade 12 (15 percent); none had no school. Most women had no decision-making power (72.5 percent), 21 percent participated in one of the decision-making activities, 6 percent in two activities, and 0.5 percent in all three activities. Most intended to use family planning in the future (83.96 percent) and most strongly disagreed that it was wrong to use contraception (65.24 percent). Most thought the ideal gap between children was two years (72.73 percent), followed by three years (22.46 percent), and then one year (4.81 percent), and the mean ideal age at marriage was 21.49. Lastly, we found that the two subscales, descriptive and injunctive gender norms, were modestly but not significantly correlated (although they approached significance) ( $-0.14$ ,  $p = 0.50$ ).

### Initial Psychometric Analysis

Visual inspection of the scree plots from exploratory factor analyses for all 28 gender norms items, along with the application of the eigenvalue  $> 2$  rule, suggested a two-factor solution (factor 1 = descriptive norms and factor 2 = injunctive norms). Factor loadings from the two-factor solution for all 28 items are presented in Table 2. As shown in the first two columns, almost all descriptive norms items loaded onto factor one and almost all injunctive norms items loaded onto factor two. Two items had factor loadings of 0.40 or below, so we removed them and their mirrored pair ( $n = 4$ ). Additionally, two items fell onto the two factors equally, so we removed them and their mirrored pair from the scale ( $n = 4$ ). The remaining 20 items appear in the third and fourth columns of Table 2, all of which loaded above 0.40. Both factors have high Cronbach's alpha scores—a measure of internal consistency (0.92—descriptive norms, 0.89—injunctive norms), meaning that the set of items are closely related to each other.

### Confirmatory Factor Analyses

Table 3 shows model fit statistics from three confirmatory factor analysis models. Model 3, which includes pairwise correlations among analogous descriptive and injunctive norms, presents the best fit. The addition of these pairwise correlations (23/24, 14/28, 9/10, 10/11, and 9/11) decreases the RMSEA from 0.115 to 0.085 and the SRMR from 0.100 to 0.090, as well as increases the CFI from 0.804 to 0.902 and the TLI from 0.780 to 0.880. This is consistent with the standards for a good-fitting model. The descriptive and injunctive norms subscales were negatively but weakly correlated with one another ( $r = -0.14$ ,  $p = 0.051$ ).

Lastly, we found that reported descriptive norms were lower (or less equitable) than injunctive norms in the overall sample (descriptive norms = 2.26, SD: 0.90; and injunctive norms = 3.64, SD: 0.73). In other words, women were reporting more equitable injunctive gender norms (expectations) than *actions* (*actual behavior*).

**TABLE 2 Exploratory factor loadings for the Nepali G-NORM scale**

	Original items factor 1	Original items factor 2	Reduced items that loaded above 0.4 on the injunctive pairs	Reduced items that loaded above 0.4 and clearly loaded onto one factor
Descriptive norms: "In most families you know..."				
1. Taking care of children is only the woman's job	0.78	0.05		
2. Only men are the ones who earn money for the family	0.77	-0.03		
3. Women's parents pay a dowry when their daughter gets married	0.52	0.14	0.51	0.52
4. Women obey their husbands in all matters	0.63	-0.33	0.66	0.65
5. Only men make decisions about household income and expenses	0.69	-0.10	0.70	0.69
6. Women ask permission from their husbands to get medical treatment of any kind	0.57	0.06	0.74	
7. Women ask permission from their husbands or mother-in-laws to leave the house	0.70	0.13	0.58	0.58
8. Husbands make the decision about buying major household items	0.80	-0.24	0.71	0.72
9. Husbands make the final decision about when to have their first child	0.80	-0.15	0.80	0.82
10. Husbands make the final decision about the total number of children they want	0.83	-0.100	0.83	0.85
11. Men make decisions about whether or not their wife can use family planning methods	0.84	-0.11	0.84	0.85
12. Parents make the decision about who their daughter will marry	0.76	0.00	0.76	0.75
13. Women eat last, after all the family members have eaten	0.73	0.10	0.73	
14. Women eat whatever is left over after the rest of their family has finished eating	0.75	-0.20	0.76	0.71
Injunctive norms: "Most families you know believe that..."				
15. It <i>should</i> only be a woman's job to take care of the children	0.61	0.27		
16. Men <i>should</i> be the only ones who earn money for the family	0.62	0.36		
17. Parents <i>should</i> pay a dowry when their daughter gets married	-0.06	0.64	0.64	0.65
18. Women <i>should</i> obey their husbands in all matters	-0.12	0.58	0.58	0.60
19. Only men should be responsible for household income and expenses	-0.10	0.75	0.75	0.74
20. Women should ask permission from their husbands to get medical treatment of any kind	0.44	0.56	0.57	
21. Women <i>should</i> ask permission from her husband or mother-in-law to leave the house	0.13	0.70	0.70	0.66
22. Husbands <i>should</i> make the decision about buying major household items	-0.03	0.72	0.71	0.72
23. Husbands <i>should</i> have the final say about when to start trying to have their first child	-0.07	0.65	0.64	0.66
24. Husbands <i>should</i> make the final decision about the total number of children they want	-0.22	0.72	0.71	0.72
25. Men <i>should</i> make the decision about whether or not their wife uses family planning methods	0.09	0.54	0.55	0.55
26. Parents <i>should</i> decide who their daughter will marry	-0.21	0.82	0.81	0.80
27. Women <i>should</i> eat last, after all the family members have eaten	0.40	0.48	0.51	
28. Women <i>should</i> eat whatever is left over after the rest of their family has eaten	0.10	0.49	0.50	0.49

<sup>a</sup> Descriptive norms and injunctive norms are mirrored pairs. If one item did not load well, we removed the pair (items 1/15 and 2/16). We also removed two pairs that loaded onto each factor almost equally (6/20) and (13/27).

<sup>b</sup> All response options are on a 5-point Likert scale: strongly disagree, disagree, neither agree or disagree, agree, strongly agree.

<sup>c</sup> Nepali-specific items are highlighted in gray.

**TABLE 3** Model fit statistics from three confirmatory factor analysis models (n=187)

Factor structure	Two factor (descriptive and injunctive) model		
	Model 1	Model 2	Model 3
Correlated errors	None	Analogous pairs	Pairs plus 9/10, 9/11 10/11, 23/24, 14/28
Fit statistics			
RMSEA	0.115	0.125	0.085
CFI	0.804	0.749	0.902
TLI	0.780	0.710	0.880
SRMR	0.100	0.136	0.090
Chi-squared	585.648 model versus saturated 2,316.443 baseline versus saturated	934.492 model versus saturated 3,043.240 baseline versus saturated	2,316.443 baseline versus saturated 364.034 model versus saturated
AIC	9,458.603	11,501.604	9,264.990
BIC	9,655.701	11,776.248	9,507.323

<sup>a</sup>Column 3 shows the final and best fitting model. Good-fitting models are indicated by a Tucker–Lewis (TLI) and Comparative Fit Index (CFI) equal to or greater than 0.90 and a Root Mean Square Error Approximation (RMSEA) less than 0.08, and standardized root mean squared residual (SRMR) less than 0.10. Aikake Information Criteria (AIC), Bayesian Information Criteria (BIC)—smaller numbers = better fitting model (Vanderberg and Lance 2000).

**TABLE 4** Overall mean and standard deviation of the G-NORM and breakdown by subgroup

	Descriptive norms Mean (SD)	Injunctive norms Mean (SD)
<b>Overall sample</b>	2.26 (0.90)	3.65 (0.74)
<b>Caste</b>		
1. Brahmin/Chheetri	3.21 (0.61)	2.46 (0.74)
2. Janajati	2.17 (0.82)	2.33 (0.79)
3. Dalit/Muslim/Other	1.76 (0.71)	2.28 (0.62)
<b>Education</b>		
1. None	1.55 (0.71)	2.16 (0.67)
2. Class 1 to 5	1.80 (0.64)	2.09 (0.72)
3. Class 6 to 12	2.31 (0.91)	2.39 (0.76)
4. More than class 12	2.72 (0.84)	2.89 (0.66)

<sup>a</sup>Castes are in descending order from least marginalized (Brahmin) to most marginalized (Dalit/tarai).

## Gender Norms Mean and Standard Deviation and Breakdown by Subgroup

Table 4 shows that injunctive norms are higher (more equitable) than descriptive norms (injunctive norms mean = 3.65 [SD: 0.74]) (descriptive norms mean = 2.26 [SD: 0.90]). The general pattern held across the three levels of caste (Brahmin/Cheetri, Janajati, and Dalit/Muslim/Other) and across the four levels of education.

Table 5 shows the final gender norms items that we retained after all analysis (20 items total—10 descriptive norms items and 10 mirrored injunctive norms items). All response options are on a 5-point Likert scale: strongly disagree, disagree, neither agree or disagree, agree, strongly agree. Half of the items (10) are new items based on this adaptation in Nepal. Nepali-specific items are highlighted in gray.

## Association of G-NORM with Reproductive Health Attitudes

We next measured the association between injunctive and descriptive norms and five reproductive attitudes. First, we ran separate models for each subscale independently, and then a model for each outcome with both the descriptive and injunctive norms subscales together. Table 6 shows that descriptive norms were more often significantly associated with reproductive attitudes than injunctive norms, both individually and when both were included in the same model. Specifically, higher (more equitable) descriptive gender norms were associated

**TABLE 5** Nepali G-NORM scale (20 items total–10 items in each subscale)**Descriptive norms**

In most families you know women's parents pay a dowry when their daughter gets married  
 In most families you know women obey their husbands in all matters  
 In most families you know only men make decisions about household income and expenses  
 In most families you know women ask permission from their husband or mother-in-law to leave the house  
 In most families you know husbands make the decision about buying major household items  
 In most families you know husbands make the final decision about when to have their first child  
 In most families you know husbands make the final decisions about the total number of children they want  
 In most families you know men make decisions about whether or not their wife can use family planning methods  
 In most families you know parents make the decision about who their daughter will marry  
 In most families you know women eat whatever is left over after the rest of their family has finished eating

**Injunctive norms**

Most families you know believe that women's parents pay a dowry when their daughter gets married  
 Most families you know believe that women *should* obey their husbands in all matters  
 Most families you know believe that only men *should* be responsible for household income and expenses  
 Most families you know believe that women *should* ask permission from her husband or mother-in-law to leave the house  
 Most families you know believe that husbands *should* make the decision about buying major household items  
 Most families you know believe that husbands *should* have the final say about when to start trying to have their first child  
 Most families you know believe that husbands *should* make the final decision about the total number of children they want  
 Most families you know believe that men *should* make the decision about whether or not their wife uses family planning methods  
 Most families you know believe that parents *should* decide who their daughter will marry  
 Most families you know believe that women *should* eat whatever is left over after the rest of their family has eaten

<sup>a</sup>All response options are on a 5-point Likert scale: strongly disagree, disagree, neither agree or disagree, agree, strongly agree.

<sup>b</sup>Nepali-specific items are highlighted in gray.

with having a higher score on the decision-making scale (being more involved in decision-making) ( $b = 0.24$ , 95 percent CI 0.13–0.35). Similarly, more equitable descriptive gender norms were associated with increased odds of intent to use family planning in the future (OR = 5.28, 95 percent CI 1.94–14.4). Having more equitable descriptive gender norms was associated with lower odds of agreeing that it is wrong to use family planning (OR = 0.14, 95 percent CI 0.064–0.29). Higher ideal age at marriage was similarly associated with more equitable descriptive gender norms ( $b = 0.46$ , 95 percent CI 0.12–0.80) but the ideal gap between marriage and first birth was not. For injunctive norms, only strongly disagreeing that it is wrong to use family planning was associated with more equitable gender norms (OR = 2.11, 95 percent CI 1.20–3.71), however, when both descriptive and injunctive norms were included together, this lost significance. The association between descriptive norms and each outcome changed negligibly when injunctive norms were included.

## DISCUSSION

This study used a mixed-methods approach to adapt and validate a theory-based gender norms scale originally developed in rural India, to a new setting: the Nawalparasi district in Nepal. Our findings confirmed that a two-factor model (descriptive norms and injunctive norms) comprising 10 items each did indeed fall onto two separate factors and best represented the overall construct of gender norms. However, only half of the original items were retained, and we included additional items in this new context. Like in India, we found that women reported more equitable injunctive norms (perceptions around gender expectations) compared to descriptive norms (perceptions about actual behavior). This illustrates that perceived expectations may be changing faster than perceived behaviors around gender norms. This has implications for interventions trying to change gender norms as it is important

**TABLE 6 Associations between the G-NORM scale and reproductive decision-making and attitudes (n=187)**

	Decision-making score	Intend to use family planning in the future (odds ratio)	Agree that it is wrong to use family planning (odds ratio)	Ideal gap between marriage and first birth	Ideal age at marriage
Each subscale separately					
Descriptive Gender Norms Subscale	0.24** (0.13–0.35)	5.28** (1.94–14.4)	0.14*** (0.06–0.29)	-0.026 (-0.12 to 0.07)	0.46** (0.12–0.80)
Injunctive Gender Norms Subscale	-0.039 (-0.15 to 0.08)	0.71 (0.35–1.45)	2.11** (1.20–3.71)	0.038 (-0.05 to 0.13)	-0.016 (-0.35 to 0.32)
Both subscales in the same model					
Descriptive Gender Norms Subscale	0.24*** (0.12–0.35)	5.18** (1.88–14.3)	0.15*** (0.070–0.34)	-0.022 (-0.12 to 0.073)	0.46** (0.12–0.81)
Injunctive Gender Norms Subscale	-0.014 (-0.13 to 0.097)	0.90 (0.42–1.93)	1.31 (0.70–2.44)	0.036 (-0.056 to 0.13)	0.032 (-0.30 to 0.37)

NOTES: We controlled for the following: age, education, caste, arranged marriage versus love marriage, religion, husband's education, wealth quintile, given birth, or currently pregnant. Confidence intervals in parentheses.

<sup>a</sup> All response options are on a 5-point Likert scale from 1 to 5. Higher scores = more equitable gender norms.

\*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05.

to measure both perceived expectations and perceived behaviors. Our scale with separate subdomains allows researchers to do just that.

Building upon our work in India, we found that higher (more equitable) *descriptive norms* were associated with several other related constructs, including higher scores on the decision-making scale, higher odds of intending to use family planning, more strongly disagreeing that it was wrong to use family planning, and higher ideal age at marriage. Descriptive norms were not significantly associated with a wider ideal gap between marriage and the first birth or age at first birth, perhaps because most women in this sample had already given birth/were pregnant and all were married relatively young. There was also little heterogeneity in these two responses. Higher (more equitable) *injunctive norms* were only significantly associated with disagreeing that it was wrong to use family planning. Sexual and reproductive health researchers working to increase contraceptive agency, women's decision-making, and marital age may want to consider gender norms as critical, upstream components of behavior change interventions. As gender equality gains recognition as a public health priority, it is critical to measure norms as an important outcome in themselves, as well as a barrier to or facilitator of behavior change, to craft effective and informed health-promotion interventions (Weber et al. 2019). A recent call in the literature argues for sexual and reproductive health interventionists to move beyond a myopic measure of contraception use to consider a woman's whole social context including social and gender norms (Galavotti and Gullo 2022). Our findings bolster this argument.

Our finding that the two-factor scale remained intact differed from the GEM scale when it was validated in multiple settings. The GEM scale was originally developed in Brazil with two factors (subscales) and then subsequently validated in Uganda and India. When the GEM scale was validated in these new contexts, the two-factor structure did not hold and in both Uganda and India, one overall factor was used (Pulerwitz and Barker 2008; Vu et al. 2017; Flemming et al., 2018). Similarly, Gjersing and colleagues (2010) found that an opioid scale's structure did not hold in cross-country validation, and they subsequently wrote about the importance of cross-country adaptation of scales. DeVellis (2017) also writes about the importance of cross-country adaptation to ensure that researchers are measuring what they intend to.

Though this is a methodological paper, our findings also make a conceptual contribution, by validating the underlying two-dimension structure, first articulated by Cialdini et al. (1991) as descriptive and injunctive norms. We also empirically show that these two constructs, descriptive and injunctive norms, have a very modest (not significant) association further bolstering our argument that they are unique and measuring them separately is critical. Additionally, the theory of normative social behavior states that injunctive norms moderate the relationship between descriptive norms and the outcome. Therefore, separating these two constructs, as the G-NORM does, can illuminate how and which norms affect behavior (Rimal and Real 2005).

These findings also demonstrate the importance of focusing on both descriptive and injunctive norms from a gender perspective. By assessing both descriptive and injunctive norms, we were able to ascertain, as in India, that injunctive norms in Nepal were higher (i.e., more equitable) than descriptive norms. What we do not know, however, is the

immutability of these two norms. For interventions, changing descriptive norms may be easier (by communicating, e.g., that many others are engaging in the focal behavior) than changing injunctive norms (which requires communicating about perceived levels of support), but which of these changes is more instrumental in driving behaviors remains unclear. We also do not know which of the two norms decay (or strengthen) more quickly. This is a ripe area for future work. Given the low correlation between the descriptive and injunctive norms subscales, however, and the fact that the two subscales had different patterns of associations with other variables, we recommend *not* combining them into a single score but rather treating them as two separate independent or dependent variables, depending upon the application.

## Limitations

One limitation of this study is the inclusion criteria and subsequent narrow sample (recently married women aged 18–25). While this sample was the population of focus for the parent study, it may have implications for the utility of the scale. However, to rectify this issue, we conducted cognitive interviews with all women of reproductive age regardless of marital status. The qualitative research underpinning the scale was conducted with newly married, nulliparous women, while the G-NORM scale was implemented with women 18 months post-marriage, many of who already had children. Conducting the cognitive interviews with women who had been married longer and who had more children allowed us to adjust the scale to represent the norms of women beyond the initial days of marriage. Additionally, the sample size is rather small. Despite this, we were able to see significant associations between the G-NORM and the majority of hypothesized variables. Another potential limitation is that we translated the items from English to Nepali, but some of the cognitive interviews were conducted in the local language, Awadhi, so the interviewer instantly translated the questions. While this may have introduced inconsistencies in comprehension and/or cognitive interview feedback, this is the reality of testing an instrument in settings with multiple languages. Ultimately, we decided that conducting interviews in the language that respondents were most comfortable with was important. Additionally, our injunctive norms items do not include any social sanctions (consequences if women do not comply with expectations). While some items included social sanctions originally, after cognitive testing, we decided to keep them short to improve understanding given the context we were working in. Finally, based on theory and the desire to have a parsimonious scale, we made the methodological decision to remove items in pairs if one of the pairs (descriptive or injunctive norms) did not have a 0.4 loading or above. However, certain descriptive gender norms may be more salient than the corresponding injunctive norm and vice versa, so we may have left out salient items, but we felt that parsimony and parallelism trumped this potential limitation. Despite these limitations, this study uses a mixed-methods, theoretically grounded approach to adapt the gender norms scale. Women were randomly sampled to participate in the study so they may be more representative of the women in this region. We also conducted cognitive testing with immediate feedback and real-time item revisions to improve and retest the items. Additionally, the same two-factor structure clearly held together with high Cronbach's alphas for each subscale.



## Study Implications

By capturing perceptions of community-level gender norms and differentiating two important social norms concepts (descriptive norms and injunctive norms), this scale improves on existing gender norms measurement. There have been calls in the literature to improve how we measure gender norms (Batliwala and Pittman 2010) and to adapt and validate scales for each new setting to ensure that they are relevant (Gjersing et al. 2010). While this process is resource intensive, it is critical to ensure that researchers are in fact measuring what they set out to measure. This improved measurement tool could be valuable to interventionists working to reduce gender inequalities in Nepal or on other sexual and reproductive health programs known to be associated with gender norms (e.g., contraceptive agency, attitudes about contraception, etc.) (Mandal et al. 2017). Furthermore, researchers have limited resources; one parsimonious scale that covers multiple constructs within the larger umbrella of gender norms may be the difference between measuring gender norms or not. Given that global crises, such as the COVID-19 pandemic, threaten gender equality, entrench restrictive gender norms, and increase the risk of harmful practices, particularly in Nepal, this improved measure is needed (UN Gender Equality Update: Covid 19 and Harmful Practices in Nepal, Hartmann et al. 2016). It is important, now more than ever, to properly measure how and which gender norms are changing.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. Interested parties are invited to contact the corresponding author.

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## ACKNOWLEDGMENTS

This work was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (1K01HD08628). This work was also supported by a grant from the Sigur Center for Asian Studies at George Washington University (no grant number).