

Social Psychology

# An Improved Measure for the Strength of Social Gender Norms (SSGN) Developed for Adolescents in Uttar Pradesh, India

Krittika Gorur<sup>1</sup><sup>a</sup>, Ben Cislighi<sup>2</sup>, Patrick Forscher<sup>1</sup>

<sup>1</sup> Busara Center for Behavioral Economics, Nairobi, Kenya, <sup>2</sup> Department of Global Health & Development, London School of Hygiene and Tropical Medicine, London, UK

Keywords: social norms, gender, measurement, development, India

<https://doi.org/10.1525/collabra.75220>

---

## Collabra: Psychology

Vol. 9, Issue 1, 2023

---

Social norms can frame how typical and appropriate the choices available to individuals are, making some more difficult while others easier to make. Despite the important role of both descriptive and injunctive norms for intervention, few measures are available that distinguish these types of perceptions. Fewer still are tailored for settings where development challenges are present and behaviorally-informed interventions are implemented. To address gaps in measuring social norms that impact women's employment in India, this study was conducted with 399 adolescents aged 14-17 years to develop the Strength of Social Gender Norms (SSGN) scale. Exploratory factor analysis demonstrated a good two-factor structure. Psychometric analyses satisfied tests for internal consistency, differentiated it from attitudes, and found moderate test-retest reliability. Using this scale, we found that girls perceived more positive social norms overall but held more negative perceptions of what others in their communities think about women working (i.e. injunctive norms), relative to boys. Our results confirm the ability of the SSGN scale to distinguish different aspects of social norms among low-income Indian adolescents, a population that is neglected in psychology research at large. Future research should aim to replicate results in additional hard-to-reach samples and investigate the association between actual longer-term employment outcomes of women.

### Introduction

Social norms are one of the oldest and most important concepts in behavioral sciences (Cialdini et al., 1991) and increasingly figure in interventions for global development challenges (C. J. Clark et al., 2018; Lede et al., 2019; Tankard & Paluck, 2017). For example, just 30% of women participate in the Indian labor market (Fletcher et al., 2017). Scholars argue that restrictive gender norms may explain this low rate (Anukriti et al., 2020), and practitioners have prioritized social norms interventions as a result (UNDP, 2020; UNFPA, 2020). Social norms, in addition to their practical relevance, are essential components of various models that suggest how individuals adopt the traits of the roles assigned to them (e.g. Social Role Theory; Eagly & Wood, 2012), how individual choices are shaped by the fit they perceive in different environments (e.g. Theory of Precluded Interest; Cheryan & Plaut, 2010), and how an individual's vocational interests and goals can be influenced by contextual factors (e.g. Social Cognitive Career Theory; Lent et al., 2002). Despite this significance, there are few

theoretically-driven and context-specific tools available that can effectively capture the nuances of these norms, and still fewer adapted for Global South settings. We take a step toward addressing these limitations by developing and testing a measure of the strength of social norms that underlie gender disparities in employment opportunities with adolescents in India.

How we measure a construct determines which evidence is brought to bear to understand it. Most theories define social norms as a person's perception of which behaviors are common in (*descriptive norms*) or appropriate by (*injunctive norms*) their group (Cialdini & Trost, 1998). Gender norms define "acceptable and appropriate actions for women and men [or people of another gender] in a given group or society" (Cislighi & Heise, 2019, p. 415). In order to know what kind of social norm program is needed and whether it works, we need a measure that precisely captures this perception. Without a valid and reliable measure, theory cannot advance and any programs that use that theory will be evaluated incorrectly, with onward effects for advancing gender equality.

---

<sup>a</sup> Correspondence should be addressed to Krittika Gorur. E-mail: [krittika.gorur@busaracenter.org](mailto:krittika.gorur@busaracenter.org)

Unfortunately for gender equity programs, the measurement of the norms affecting women's employment is beset by at least six problems: 1) the conflation of norms and attitudes, 2) items defined for one norm typology 3) omission of the entire constellation of norms, 4) availability of general norms measures, 5) measuring only the presence of norms, and 6) overreliance on narrow samples. While this partially reflects the different methods scholars have used as proxies to measure social norms, existing scales represent an incomplete theoretical unification with how social norms have been conceptualized in frameworks and miss nuances of the phenomena we are studying. We describe each problem below.

### Problems in the Measurement of Social Gender Norms

For the first gap, most scales insufficiently differentiate social norms from attitudes, or the feelings a person has toward specific conduct (GEH, 2020). While related, these concepts are distinct. The average personal preferences of a group or what members of that group do could be clustered and labeled as community norms. Even this concept, however, is different from what individuals perceive to be the social norm in their environment, which influences their behavior.

Second, studies of gender norms tend to focus exclusively on *injunctive* norms (e.g. Dhar et al., 2022). This means that measures of social norms neglect what people perceive as how *typical* it is for women to engage in paid work, instead centering exclusively on whether others think women *should* work. The omission of *descriptive* norms is problematic because the behavior of others is a critical cue used to guide one's own behavior (Cialdini et al., 1991), and shapes what people believe they should do (Smith et al., 2012).

Thirdly, measures that satisfy the above prescriptions solely focus on the act of women working (e.g. Das et al., 2021; Field et al., 2021). A review of barriers to labor market participation suggests that social norms indirectly affect women's choice to work by restricting movement, decreasing social interactions with the opposite gender, and requiring the caretaking of family members (Jayachandran, 2021). Consequently, a single-item indicator of the act of working provides a reduced understanding of all the normative barriers that restrict women's agency to work.

The use of non-specific norms for measuring context-specific behaviors, like women's work, introduces the fourth problem. Even when indirect social norms are measured, they are too broad to elicit perceptions as they apply to the practice of women working (e.g. Baird et al., 2019). To illustrate, a broad gender norms scale captures injunctive norms by enquiring whether respondents think that their community expects 'adolescent girls to go to college' generally but not whether the community expects 'girls to be college-educated to secure employment'. Although educating girls may be deemed appropriate when viewed from the perspective of the marriage market, it may call forth a different belief when considered as a means to further their financial autonomy. One exception is a measurement by

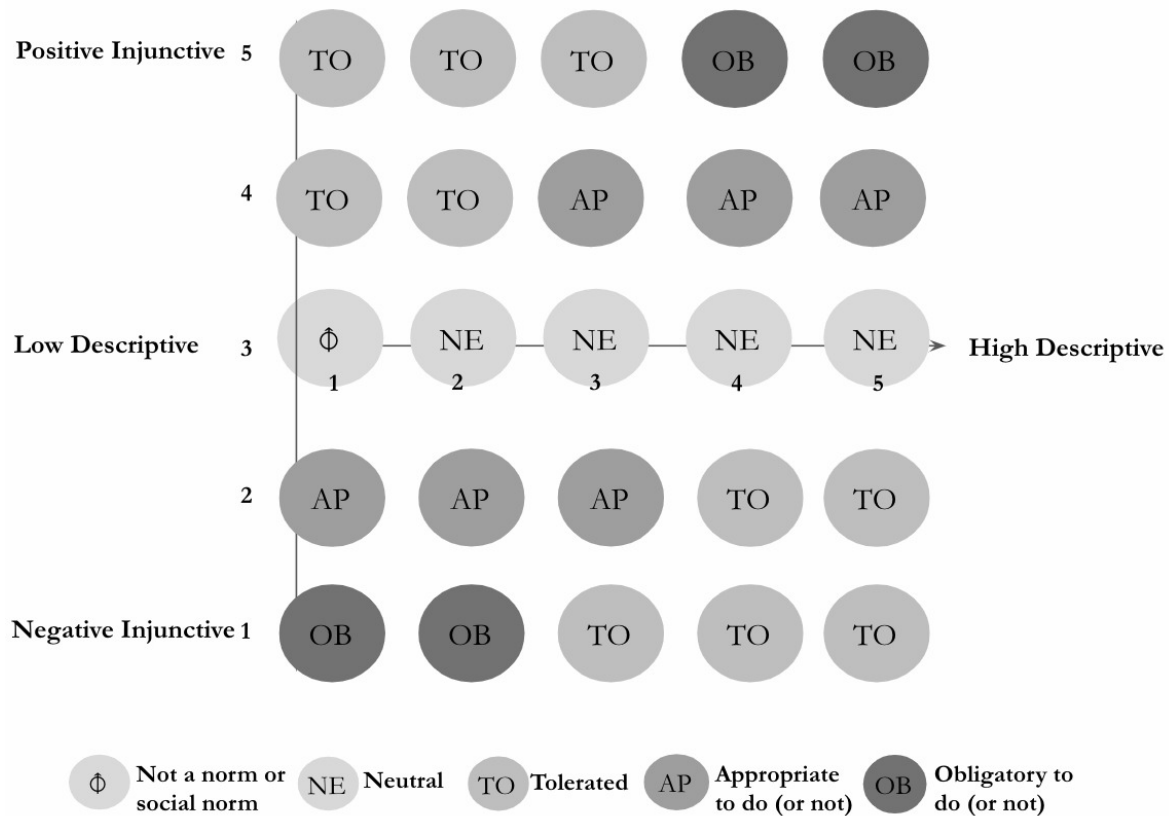
Gauri, Rahman, and Sen (2019) that assessed social norms affecting women's employment in Jordan and included aspects related to the ability to work alongside care responsibilities and in a mixed-gender environment.

The fifth gap is that existing measures assess the presence of social norms, but do not capture their strength. In their Theory of Normative Spectrum, Cislighi and Heise (2018) suggested that the influence of social norms on different behaviors varies, so that compliance with a norm can be, depending on its strength, obligatory (e.g. women must not work), appropriate (e.g. women better not work), tolerated (e.g. women can work), or neutral and possibly rare but imaginable (e.g. women could work). While a scale that assesses such conduct based on approval-to-disapproval or agreement-to-disagreement is convenient, the strength of social norms remains ambiguous. For example, reporting that a community would disapprove of women working does not distinguish between tolerating this behavior and perceiving it as inappropriate.

Finally, the sixth gap calls the suitability of our theories and measures for settings like India into question. A recent audit of psychology journals found that just 18% of all research samples come from outside the United States and Europe, despite these regions comprising 83% of the global population (Thalmayer et al., 2021). Norms theory and studies used to validate the social norms approach are not immune to this trend (Dempsey et al., 2018). We find a lack of suitable measures to assess women's participation in the workforce, particularly in non-Western countries. Because these countries often fall behind others in terms of female labor participation, the need for a measure tailored to the context of non-Western countries, such as India, is imperative. Moreover, because expectations are formed by culture, social norms are likely to be shaped by cultural mores (Gelfand et al., 2017). Uttar Pradesh, the state where we conduct this study, reports a female literacy rate of 63.4%, one of the lowest performing in India and 18.4 percentage points lower than the male literacy rate in the state (National Sample Survey, 2018). Uttar Pradesh is simultaneously the most populous state and one of the poorest subnational units in India, and features one of the poorest female employment rates (20.6%) relative to India as a whole (International Institute for Population Sciences & ICF, 2021). At a minimum, this cultural influence should be reflected in the content of norm perceptions (Wazir, 2023), which needs context-specific measures to account for such differences.

### The Present Research

We developed and validated a new measure of the Strength of Social Gender Norms (SSGN). To address the four issues related to item content, we 1) framed social norm items ('what people in your community believe...') as discrete from personal attitudes ('what you believe...'), 2) included items about a descriptive fact ('how many women in your community...') with an injunctive equivalent ('what would most people in your community say if women...'), 3) expanded item coverage to social norms that also indirectly influence the target behavior (e.g. working as sole bread-



**Figure 1. Illustration of how scores on each of the descriptive and injunctive sub-scales can be combined and mapped onto an associated level of social norm strength.**

winner), and 4) tailored cross-cutting norms to the specific behavior (e.g. returning home from work late, rather than general mobility).

We intend to address the current inadequacy in capturing the strength of social norms by operationalizing the Theory of Normative Spectrum. We present a conceptual framework of normative strength based on potential interactions of descriptive and injunctive norms (see [Figure 1](#)). Our work contributes to this gap by parsing normative influence into degrees of importance, based on how much deviation from the social norm is allowed. We test the possibility of using the TNS by creating an ordinal response scale that specifies the nature of sanctions in response to complying or deviating, in the form of contextualized anchors.

To address the problem that most prior work focuses on the Global North, we developed this measure in a population and setting commonly neglected in psychology and norms research: adolescents in low-income areas of India. Uttar Pradesh is a laggard state characterized by poor performance on sociodemographic indicators such as gender inequality (Guilmoto et al., 2018), and can demonstrate whether social norms can be reliably elicited in such different cultural conditions.

## Methods

Our scale development proceeded in three phases. We report on all decisions taken in the course of collecting and analyzing data.

### Phase 1: Item Development

#### Item Generation

We generated a long-list of norm items based on a literature review. We recognized that the perceived typicality and desirability of employment are characterized by a woman's age and may coincide with marital status, which draws an important distinction in our context (Kalpagam, 2008). Our items therefore distinguished between social norms that concern the behavior of 'women' and 'girls'. The main themes included: i) working outside the home, ii) freedom of movement and interactions in mixed-gender work environments, iii) gendered household practices (e.g. working before or after marriage, the responsibility of household chores, being the breadwinner), iv) exerting agency over earned income, v) gaining education to improve job prospects, vi) working due to financial circumstances, and vii) working in specific jobs.

## Expert Review

We validated the content of our long-list by organizing an expert panel of five. The panel comprised researchers and practitioners, who, combined, had expertise in social norms, psychometrics, and Indian adolescents. We developed a qualitative evaluation criterion for experts to indicate the a) clarity of each item's framing and structural arrangement, b) alignment with social norms theory, and c) comprehensiveness of the item set.

## Pre-Testing

We conducted cognitive interviews in two rounds to assess comprehension and suitability ( $n = 12$ ), with revisions to items between rounds. We recruited three male and three female adolescents in each round using a convenience sampling strategy, with variation in their age and locations across urban-rural regions in Uttar Pradesh. In this interview, we used the think-aloud technique to detect any items that were being misconstrued and test the cognitive usability of question-options (Willis & Artino, 2013).

## Social Norm Scale

32 items were retained in the test survey (see Online Appendix B). Descriptive norms were rated on a 5-point Likert scale, where 1 = "No One Does", 2 = "Less Than Half Do", 3 = "Half Do", 4 = "More than Half Do", and 5 = "Everyone Does". The 5-point scale for injunctive norms ranged from 1 = "Very Bad: 'Their family will be shunned'", 2 = "Bad: 'A few people will ask questions and gossip'", 3 = "Nothing: No one will say anything", 4 = "Good: 'A few people will support them'", 5 = "Very Good: 'Their family will be celebrated'". We randomized items within the descriptive and injunctive norm sets of questions, to eliminate the possibility of response order effects. All items were translated to Hindi and back-translated to English by separate bilingual speakers.

Social norms are only applicable to the extent that the group influences how people 'think, feel and see things' (Saxena, 1971). Accordingly, the specification of a reference group that is relevant to adolescents is essential to this measurement. Following Costenbader, Lenzi, Hershov, Ashburn, and McCarragher (2017) recommendation, we asked adolescents to think of a group that they most identify with at the beginning of the survey, prior to presenting students with the set of social norms items. We subsequently referred to the phrase "your community", to elicit the exact community reference group that adolescents had identified earlier, for all descriptive and injunctive norm items in the scale.

## Phase 2: Scale Development

### Sample

Our sample consisted of 399 students (199 boys, 200 girls) from Grades 9 and 10, who were 14-17 years of age in Uttar Pradesh. This age group was chosen because they - 1) start contemplating longer-term goals such as career aspi-

rations, and 2) move from concrete to abstract moral reasoning (Yu et al., 2017). Our sample size meets the criteria recommended for an interpretable factor structure, with more than 300 respondents (Guadagnoli & Velicer, 1988) and a 12.3:1 ratio of subjects to the number of items (Gorsuch, 1983).

## Test Survey

We partnered with Breakthrough India, an organization that works to promote girls' and women's rights through a program in government secondary schools. We sampled boys and girls from 20 schools across six blocks in two districts, Lucknow and Gorakhpur. Permission from school districts and informed assent from caregivers were obtained. One caregiver did not consent for their child to participate. All students also provided informed consent under a protocol approved by an Institutional Review Board based at Morsel, India.

## Item Reduction and Factor Extraction

We apply exploratory factor analyses (EFA) to remove poorly performing items. We test for statistical assumptions that establish the suitability of data for structural detection first, which need the KMO value to be over 0.5 and a significance level for the Bartlett's test to be below 0.05 (Hair et al., 2006; Kaiser, 1974). Maximum likelihood extraction with oblique promax rotation was used to identify the number of dimensions, which allows for potential factors of social norms to be correlated with one another (Osborne, 2015). To account for the fact that our scale items are ordinal, we use polychoric correlations in the EFA (Holgado-Tello et al., 2010). We used a scree plot and retained factors with an eigenvalue of above 1 (Cattell, 1966). The minimum acceptable factor loading for items to be retained was set at 0.3 (Comrey & Lee, 1992). Because we assume that descriptive and injunctive norms are equally important, we assign equal weight to each pair of social norm items.

## Phase 3: Scale Evaluation

### Internal Reliability

We estimated the internal reliability of the scale and subscales via Cronbach's alpha, where values of 0.70 or higher were considered acceptable (DeVellis, 2003). An average correlation between items of 0.15-0.50 was taken to demonstrate item homogeneity while containing an adequate amount of unique variance (L. A. Clark & Watson, 2019). We considered a minimum item-total correlation of 0.30 to establish discriminating items (e.g. Nunnally & Bernstein, 1994).

### Test-Retest Reliability

We also assessed score consistency by using test-retest reliability (DeVellis, 2003), to estimate scale-level and item-specific intraclass correlation coefficients (ICCs). Our sample of 211 adolescents who completed both waves gives

us 95% power to detect a reliability of 0.5. A value between 0.4-0.75 establishes good test-retest stability (Fleiss, 1986).

### Retest Survey

The same set of questions was administered twice. The second survey wave was conducted 3 weeks later, to override any memory or carryover effect from the first set of responses. It is also short enough to reduce the likelihood of measuring an actual change due to learning experiences about the number of women working or its social appropriateness. Due to school closures amid the Covid-19 surge in January 2022, data collection for all adolescents surveyed in the first round could not be completed as planned. We, therefore, relied on a subset of just over 50% of the original sample that covered half the number of schools across both districts.

### Construct Validity

We assessed the validity of the scale by using the conceptual link between perceived social norms and related variables that may affect or be affected by social norms. To differentiate this construct as distinct from rival alternative constructs (Messick, 1995), we expected low cross-construct correlations ( $< .30$ ) between social norm items and measures of 1) attitudes, which are distinct from social norms but function in relation to each other (Rimal & Real, 2005), and 2) perceived household time allocation, where gender norms are characterized by the allocation of time (Campaña et al., 2018) and the observed time use of female household members could inform norm perceptions. While attitudes towards the behaviors of interest and perceived time allocation of female household members are likely to influence or be influenced by social norms and thereby correlated ( $> .20$ ), we expect the correlations to be moderate ( $< .40$ ), indicating that our measure of social norms is distinct and accurately captures unique aspects of social norms. This is what we refer to as divergent and convergent validity. To further assess structural dissimilarity, we use factor analysis, expecting items to load on only their theoretical factor with a value greater than 0.30 and factors to have an eigenvalue of 1.0 at minimum (Tabachnick et al., 2007).

#### Personal Gender Role Attitudes (Global)

We measure personal attitudes towards women working using the Equity for Girls Scale (EGS; Waszak et al., 2001). This contained four items about personal normative beliefs towards daughters having the same chance to work as sons, women being able to work after having children, etc. Items were rated on a 4-point Likert, with 1 = "I strongly disagree" to 4 = "I strongly agree". To the extent our scale measures social norms as a perception and not a personal belief, the scale should have a low correlation with attitudes.

#### Personal Gender Role Attitudes (Local)

The Equity for Girls Scale scale represents more global beliefs about working outside the home and this difference alone may contribute to the divergence of social norms and

attitude items. We, therefore, expected a low correlation with adolescents' personal attitudes towards the same sub-domains of women working that were covered by the social norm scale. This set of questions was included in the retest wave, and measured on a 5-point scale, where 1 = "I strongly disagree" and 5 = "I strongly agree".

#### Community Identification

A shift in either norms or attitudes does not necessarily indicate a change in the other, but norms and attitudes can be aligned (Cislaghi & Heise, 2018). We expected this alignment to be higher for adolescents who strongly identified with their community, and considered a low correlation within this group to indicate higher discriminant validity. We adapted the Inclusion of Other in Self Scale to measure the degree of identification an individual feels with their community's beliefs (IOS; Aron et al., 1992), on a 6-point scale from 1 = "Not at all" to 6 = "Completely". We transform this variable to a dichotomous, using 3 or higher as a cutoff point to group adolescents with a stronger community identity.

#### Perceived Time Allocation

We adapted a stylized question for time use that used a pictorial method of elicitation by a) illustrating all categories of activity with symbol cards, and b) using sorting marbles as a representation of time to help distribute 24 hours across activities (Rost, 2018). The time allocated was measured in hours. To the extent that our scale measures perceptions of social norms about women working rather than the time one's female caregiver spends across different activities, we should observe a weak relationship with subjective perceptions of time allocation.

To ensure we used patterns of time use that were most representative of what female household members typically do, we created a subset of responses to assess correlations for those who 1) lived with their mothers and 2) stated that the hours spent working for money yesterday was about the same as usual.

### Known-Groups Validity

We further examined the validity of the scale by observing differences based on the gender of adolescents, derived from existing literature: H1 - adolescent girls and boys will differ on social norms, where girls have previously reported higher injunctive norm perceptions than boys (Dhar et al., 2022). We, therefore, anticipated higher average scores amongst girls.

Unlike our other analyses, this analysis of validity was planned to be included as a descriptive analysis. To facilitate the interpretation of this result in the context of developing a scale, we present this hypothesized difference between known independent groups to provide evidence of validity. This departure does not change the substantive implications of our results.

## Analyses

In this section, we report on results from Phases 2 and 3. Key findings from the expert panel and target population that participated in the pre-testing from Phase 1 are summarized in Online Appendix C.

### Sample Description

From the test survey data, six outliers were detected using Mahalanobis distance and removed from further analysis. The dataset consisted of 393 adolescents who had a mean age of 15.11. 52% were in Class 9 and 48% in Class 10, with half the sample from Lucknow and the other half in Gorakhpur. For adolescents, the extended family (56%), neighborhood (28%), immediate family or family elders (8%), caste or religion (3%), and friends or school (1%), served as their reference group.

### Phase 2: Exploratory Factor Analyses

We calculated the mean, standard deviation, and median of each item in the original pool (see [Table 1](#)). Bartlett's Test of Sphericity was significant ( $\chi^2(496) = 2457.81, p < .001$ ) and the KMO test obtained a sampling adequacy value of 0.82, which is above the recommended threshold. This satisfied the conditions for EFA implementation. A scree plot pointed to an elbow below the second principal factor (see [Figure 2](#)). In most cases, the descriptive item was removed due to the corresponding injunctive item reporting a low loading.

The EFA yielded a two-factor solution in line with social norms theory. Factor 1 included items that measured the perceived prevalence of what most women or girls do (descriptive norms), while Factor 2 included items that assessed the social acceptability of behaviors (injunctive norms). Most items loaded equal to or higher than the 0.3 threshold and only on that one factor in all cases, except item 9 and item 12 in Factor 2. In the final reduced pool, Factor 1 and Factor 2 each included 11 items and reported final eigenvalues of 3.93 and 2.48 respectively (see [Table 2](#) for factor loadings).

### Subscale Descriptive Characteristics

Scores for each subscale are computed as the mean of individual items, with lower scores indicating tighter or inequitable social norm perceptions about women working and scores showing more liberal or egalitarian perceptions at the upper end. The descriptive subscale scores ranged from 1 to 5 and the injunctive subscale scores from 1.82 to 4.73 (see [Table 3](#)).

### Phase 3: Psychometric Testing

#### Internal Reliability

Cronbach's alpha reliabilities were above the accepted threshold, ranging from 0.71 for the injunctive norm subscale to 0.81 for the descriptive norm subscale (see [Table 4](#)). Items had an acceptable average inter-correlation of

0.29 for the descriptive sub-scale and 0.18 for the injunctive norm sub-scale. While all descriptive norm items reported item-total correlations above 0.30, items 11 and 14 on the injunctive norm sub-scale showed item-to-scale correlations of 0.25 and 0.29 respectively.

#### Test-Retest Reliability

We examined test-retest reliability using the second survey wave, with a matched sample of 206 adolescents after removing 5 outliers (descriptive characteristics are reported in [Table 5](#)). We found 10.4% of values for item 11 missing completely at random in one question block. To recover mean scale scores for Likert-type data, we used multiple imputation based on a random forest (Leite & Beretvas, 2010; Wu et al., 2015). We found an ICC value of .50, which is within the range considered as good reliability. Overall, we found poor reliability at the item level with ICC estimates below 0.4 for all items except one (see [Table 6](#)). The first administration's mean score was 2.98 (SD=0.40), compared with the second administration's mean score of 3.06 (SD=0.40). The test-retest correlations for the descriptive sub-scale were higher (.57) compared to the injunctive sub-scale (.38), which demonstrated poorer construct stability.

#### Construct Validity

A low correlation discriminated the scale from global personal attitudes, as adolescents who held more favorable social norms tended to have positive attitudes but this was weakly associated ( $r = 0.14$ ). EFA suggested a three-factor solution where the descriptive and injunctive factors retained their structure, while attitude items all converged on the third factor.

Adolescent ratings on the local personal attitudes scale had a higher correlation with social norm scores but one that was still low ( $r = 0.31$ ). Similar to the global personal attitude items, a factor analysis suggested a clean three-factor structure between latent social norms and local attitude items. These low correlation values and factor structures confirmed the social norm scale's discriminant properties. The stronger correlation value found amongst adolescents who identified strongly with their community's thinking about what women or girls should do ( $r = 0.36$ ), compared to adolescents with a weaker community identification ( $r = 0.18$ ), indicates that the scale showed a greater degree of overlap for individuals whose attitudes are more in line with norm perceptions.

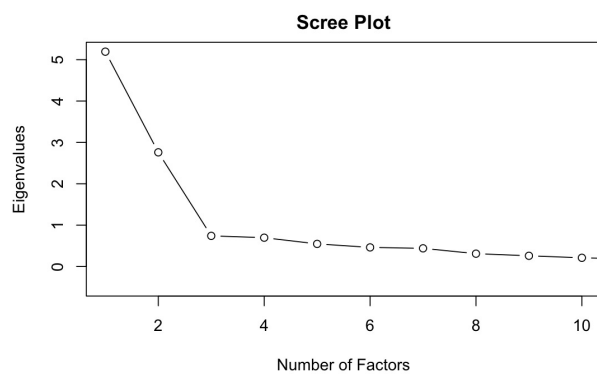
Social norm scores demonstrated a low correlation with the amount of time an adolescent perceived their mother to spend working outside the home ( $r = 0.23$ ). Further, perceived social norms showed a near-zero association with the perceived time allocated to house chores (0.04), caring for children or elderly members (-0.10), preparing meals (0.01), and sleeping or resting (-0.09). This suggests that our scale discriminated from measures of the perceived amount of time spent working for money.



**Table 1. Mean, standard deviation, and median of individual items for the sample at the first survey wave and by gender**

	Total Sample (n = 393)		Adolescent Girls (n = 198)		Adolescent Boys (n = 195)	
	Mean (SD)	Median	Mean (SD)	Median	Mean (SD)	Median
<i>Descriptive Norm Items: 'How many women in your community.'</i>						
[d_1]: Work outside the home?	2.93 (1.00)	3	3.07 (0.99)	3	2.79 (1.00)	3
[d_2]: Work outside the home after getting married?	2.47 (0.95)	2	2.61 (0.91)	2	2.34 (0.97)	2
[d_3]: Work outside the home because they need the money for daily household expenses?	3.06 (1.08)	3	3.19 (0.96)	3	2.93 (1.18)	3
[d_4]: Work outside the home because their husbands are unwell?	2.79 (1.11)	3	2.99 (1.08)	3	2.60 (1.12)	2
[d_5]: Work outside the home in order to meet the expenses of their parents?	3.03 (1.11)	3	3.30 (1.03)	3	2.76 (1.12)	3
[d_6]: Return home from work every day after 7pm?	2.52 (1.11)	2	2.58 (1.06)	2	2.46 (1.17)	2
[d_7]: Work in a private job?	2.73 (1.01)	3	2.80 (0.95)	3	2.65 (1.06)	2
[d_8]: Work with men from other families?	2.77 (1.17)	3	2.92 (1.13)	3	2.61 (1.19)	2
[d_9]: Keep their earnings with themselves?	2.47 (1.20)	2	2.59 (1.12)	2	2.35 (1.16)	2
[d_10]: Earn more money than their husbands?	2.65 (1.07)	2	2.53 (0.99)	2	2.78 (1.13)	2
[d_11]: Are the sole breadwinners for their family?	2.38 (0.91)	2	2.54 (0.93)	2	2.21 (0.86)	2
[d_12]: Give their husbands half the household chores to do?	1.86 (0.96)	2	1.77 (0.94)	2	1.94 (0.97)	2
<i>'How many girls in your community...'</i>						
[d_13]: Work outside the home?	2.73 (1.05)	3	2.87 (0.99)	3	2.59 (1.10)	2
[d_14]: Go to college in order to get a job?	3.85 (1.06)	4	4.02 (1.01)	4	3.69 (1.08)	4
[d_15]: Work outside the home immediately after leaving school?	2.65 (1.09)	2	2.82 (1.08)	3	2.48 (1.09)	2
[d_16]: Work outside the home before getting married?	2.67 (1.05)	2	2.78 (1.00)	3	2.55 (1.13)	2
<i>Injunctive Norm Items: 'What would most people in your community say if a...'</i>						
[i_1]: Woman works outside the home?	3.02 (1.09)	3	2.89 (1.04)	3	3.16 (1.10)	3
[i_2]: Woman works outside the home after getting married?	2.87 (1.07)	3	2.75 (1.03)	2	2.99 (0.84)	3
[i_3]: Woman works outside the home because she needs the money for daily household expenses?	3.41 (1.02)	4	3.40 (0.97)	4	3.42 (1.07)	4
[i_4]: Woman works outside the home because her husband is unwell?	3.61 (0.89)	4	3.55 (0.95)	4	3.68 (0.81)	4
[i_5]: Woman works outside the home in order to meet the expenses of their parents?	4.02 (0.75)	4	4.06 (0.80)	4	3.97 (0.70)	4
[i_6]: Woman returns home from work every day after 7pm?	2.41 (0.88)	2	2.34 (0.79)	2	2.48 (0.97)	2
[i_7]: Woman works in a private job?	3.82 (0.84)	4	3.81 (0.83)	4	3.84 (0.84)	4
[i_8]: Woman works with men from other families?	3.85	2	2.04	2	2.27	2

	(0.76)		(0.66)		(0.83)	
[i_9]: Woman keeps her earnings to herself?	2.46 (0.91)	2	2.40 (0.85)	2	2.51 (0.98)	2
[i_10]: Woman earns more money than her husband?	3.50 (1.17)	4	3.32 (1.19)	3	3.68 (1.11)	4
[i_11]: Woman is the sole breadwinner for her family?	3.86 (0.84)	4	3.78 (0.91)	4	3.93 (0.76)	4
[i_12]: Woman gives her husband half the household chores to do?	3.94 (0.66)	2	4.03 (0.57)	2	3.86 (0.73)	2
[i_13]: Girl works outside the home?	2.89 (1.05)	3	2.86 (1.04)	3	2.93 (1.07)	3
[i_14]: Girl goes to college in order to get a job?	3.65 (1.11)	4	3.60 (1.13)	4	2.30 (1.09)	4
[i_15]: Girl works outside the home immediately after leaving school?	3.39 (1.08)	4	3.44 (1.09)	4	3.34 (1.07)	4
[i_16]: Girl works outside the home before getting married?	2.97 (1.13)	3	2.98 (1.12)	3	2.96 (1.15)	3



**Figure 2. Scree plot of eigenvalues of factors derived from the first survey wave data in the EFA**

### Known Groups Validity

We ran independent-sample *t*-tests and found that girls reported significantly higher social norm scores ( $M=3.00$ ) than boys ( $M=2.91$ ),  $p = .04$ . Girls on average revealed higher descriptive norm perceptions by 0.29 points,  $p < .001$ . However, their injunctive norm scores were 0.11 points lower than those reported by boys,  $p = .03$ . [Table 3](#) summarizes the differences by gender. These results do not clearly support or refute the validity of our scale. We describe our reasoning in the discussion.

### Discussion

The SSGN scale showed a good two-factor structure aligning with social norms theory, acceptable internal reliability, validation of its ability to discriminate from related constructs, and moderate test-retest reliability. The scale measures distinct aspects of the prevalence and acceptability of women working outside the home. A summary of the validity evidence used to evaluate the scale is provided in [Table 7](#).

The descriptive norm subscale captures perceptions of how common it is thought to be for women to work outside the home. Similarly, the injunctive norm subscale reflects how strongly the practice of women working outside the home is considered to be appropriate. In this sample, perceived social norms affecting women's employment by adolescents were at their weakest. Consistent with other studies, girls held more favorable social norms toward women working than boys (Dhar et al., 2022). However, this was primarily on account of girls believing work-related behaviors to be more typical of their community. This could be explained through social learning theory, where girls pay more attention to behaviors modeled by the same gender (Perry & Bussey, 1979). It is also possible that beliefs around what women can and cannot do are more accessible to girls through gender role socialization (Martin et al., 1990), which can explain why boys perceived their communities to be more accepting of women working. Overall, the differences between girls and boys have implications for tailoring the design of interventions separately by gender.

Our new scale helps address six gaps in the measurement of social gender norms. First, we framed social norm items differently from personal beliefs and found these respective sets of items to be associated with distinct latent factors. Second, we included paired descriptive and injunctive items and detected a factor structure that lines up with social norms theory. We addressed the third and fourth problems by expanding item coverage to include social norms with an indirect influence and adapted items to the specific behavioral context and established an internally reliable scale. To address the fifth issue, we adapted response options to represent the strength of social norms. Our participants reported that they found some behaviors 'tolerable' and others 'appropriate'. Finally, we did this work with a sample neglected in psychology and norms research, Indian adolescents. Our study is a small but important step forward in allowing us to better assess how social norms theory applies to bigger slices of the global population. The SSGN scale, thus, offers a way to assess adolescent per-



**Table 2. Polychoric and Pearson correlations of item loadings in the EFA (N = 393)**

	Original 32 Items		Reduced 22 Items	
	Polychoric	Pearson's	Polychoric	Pearson's
<b>ML1 (Factor 1)</b>				
<i>'How many women in your community..'</i>				
[d_1]: Work outside the home?	0.65	0.60	0.65	0.60
[d_2]: Work outside the home after getting married?	0.53	0.48	0.52	0.48
[d_3]: Work outside the home because they need the money for daily household expenses?	0.69	0.64	0.68	0.63
[d_4]: Work outside the home because their husbands are unwell?	0.69	0.64	0.67	0.62
[d_5]: Work outside the home in order to meet the expenses of their parents?	0.67	0.63		
[d_6]: Return home from work every day after 7pm?	0.64	0.57	0.63	0.56
[d_7]: Work in a private job?	0.62	0.58		
[d_8]: Work with men from other families?	0.50	0.45	0.48	0.43
[d_9]: Keep their earnings with themselves?	0.40	0.34		
[d_10]: Earn more money than their husbands?	0.21	0.15		
[d_11]: Are the sole breadwinners for their family?	0.58	0.52	0.57	0.51
[d_12]: Give their husbands half the household chores to do?	0.32	0.27		
<i>'How many girls in your community..'</i>				
[d_13]: Work outside the home?	0.62	0.57	0.64	0.59
[d_14]: Go to college in order to get a job?	0.41	0.39	0.42	0.40
[d_15]: Work outside the home immediately after leaving school?	0.64	0.57	0.67	0.60
[d_16]: Work outside the home before getting married?	0.52	0.47	0.52	0.48
<b>ML1 (Factor 2)</b>				
<i>'What would most people in your community say if a...'</i>				
[i_1]: Woman works outside the home?	0.58	0.57	0.60	0.58
[i_2]: Woman works outside the home after getting married?	0.48	0.47	0.49	0.47
[i_3]: Woman works outside the home because she needs the money for daily household expenses?	0.44	0.38	0.42	0.37
[i_4]: Woman works outside the home because her husband is unwell?	0.50	0.44	0.46	0.42
[i_5]: Woman works outside the home in order to meet the expenses of their parents?	0.34	0.30		
[i_6]: Woman returns home from work every day after 7pm?	0.42	0.39	0.41	0.38
[i_7]: Woman works in a private job?	0.28	0.28		
[i_8]: Woman works with men from other families?	0.44	0.40	0.46	0.40
[i_9]: Woman keeps her earnings to herself?	0.14	0.13		
[i_10]: Woman earns more money than her husband?	0.26	0.24		
[i_11]: Woman is the sole breadwinner for her family?	0.36	0.32	0.33	0.30
[i_12]: Woman gives her husband half the household chores to do?	0.19	0.17		
[i_13]: Girl works outside the home?	0.53	0.51	0.56	0.53
[i_14]: Girl goes to college in order to get a job?	0.44	0.39	0.40	0.36
[i_15]: Girl works outside the home immediately after leaving school?	0.41	0.40	0.39	0.38
[i_16]: Girl works outside the home before getting married?	0.51	0.49	0.54	0.52

ceptions of community-level social norms about women's work. More broadly, this scale is a case study for how to develop and validate a social norms measure that incorpo-

rates important components of social norms theory within a specific context.

**Table 3. Mean, standard deviation, and median of aggregate social norm scores of reduced item pool and global personal attitudes for the sample at the first survey wave and by gender**

	Total Sample (n = 393)				Adolescent Girls (n = 198)		Adolescent Boys (n = 195)	
	Mean (SD)	Median	Min	Max	Mean (SD)	Median	Mean (SD)	Median
Social Norm Score (22 items)	2.96 (0.42)	2.96	1.68	4.86	3.00 (0.40)	3.05	2.91 (0.44)	2.86
Descriptive Norm Score (11 items)	2.80 (0.63)	2.82	1.00	5.00	2.94 (0.55)	3.00	2.66 (0.67)	2.64
Injunctive Norm Score (11 items)	3.11 (0.51)	3.09	1.82	4.73	3.06 (0.47)	3.09	3.17 (0.54)	3.09
Global Personal Attitudes (4 items)	3.62 (0.42)	3.75	1.75	4.00	3.77 (0.31)	3.75	3.46 (0.46)	3.50

**Table 4. Cronbach's alpha for the social norm scale, descriptive and injunctive norm subscales, and the personal gender role attitudes scales**

Variable	No. of Items	Cronbach's alpha	
		Wave 1	Wave 2
Social Norm Main Scale	22	0.76	0.80
Descriptive Norm Subscale	11	0.81	0.81
Injunctive Norm Subscale	11	0.71	0.76
Personal Gender Role Attitudes (Global)	4	0.64	-
Personal Gender Role Attitudes (Local)	11	-	0.77

**Table 5. Mean, standard deviation, and median of aggregate social norm scores of reduced item pool and local personal attitudes for the sample at the second survey wave and by gender**

	Total Sample (n = 206)				Adolescent Girls (n = 116)		Adolescent Boys (n = 90)	
	Mean (SD)	Median	Min	Max	Mean (SD)	Median	Mean (SD)	Median
Social Norm Score (22 items)	3.06 (0.40)	3.08	2.00	4.23	3.11 (0.38)	3.12	3.00 (0.40)	3.00
Descriptive Norm Score (11 items)	2.78 (0.55)	2.82	1.36	4.27	2.88 (0.50)	2.91	2.65 (0.59)	2.64
Injunctive Norm Score (11 items)	3.34 (0.47)	3.36	2.09	4.46	3.35 (0.45)	3.36	3.34 (0.50)	3.36
Local Personal Attitudes (11 items)	3.76 (0.56)	3.82	2.00	4.91	3.97 (0.46)	4.09	3.49 (0.56)	3.50

Our findings show how variation can exist within the larger constellation of social norms affecting women's ability to work outside the home. The mobility patterns of women related to returning from work after 7 pm posed a point of social contention. In contrast, the practice of prioritizing higher education for girls to secure work opportunities was socially acceptable. Our framework is grounded in the notion that when descriptive and injunctive norms are in conflict (i.e. one is low or weak and the other is high or strong), the resultant social norm will be incongruous. We did not, however, observe any practice related to women working to be perceived as tolerable or loosely as-

sociated with a social expectation in this setting. Furthermore, the beliefs of the specific group with whom adolescents identify as their community needs to be targeted to create common knowledge of the norm (Arias, 2019). While this group was their own family for most adolescents, a considerable proportion reported neighborhood-level networks, such as their village or mohalla. Taken together, these insights testify to the importance of using a scale that captures variability across specific normative beliefs and in who the referent group is, which is critically informative for tailoring the content of social-norm interventions and

**Table 6. Test-retest reliability indicators for the percentage of absolute agreement, the mean of the absolute difference, the standard deviation of the difference, polychoric correlation coefficient, and ICC value by item.**

Variable	% Same	Absolute Mean Difference	SD Difference	Polychoric Correlation	ICC
<i>'How many women in your community..'</i>					
[d_1]: Work outside the home?	42.7	0.82	0.86	0.27	0.25
[d_2]: Work outside the home after getting married?	48.5	0.68	0.78	0.42	0.37
[d_3]: Work outside the home because they need the money for daily household expenses?	39.3	0.83	0.79	0.40	0.36
[d_4]: Work outside the home because their husbands are unwell?	43.7	0.80	0.83	0.49	0.41
[d_6]: Return home from work every day after 7pm?	50.5	0.74	0.92	0.40	0.35
[d_8]: Work with men from other families?	35.4	0.98	0.94	0.27	0.22
[d_11]: Are the sole breadwinners for their family?	41.7	0.71	0.79	0.24	0.17
<i>'How many girls in your community...'</i>					
[d_13]: Work outside the home?	39.3	0.84	0.81	0.35	0.29
[d_14]: Go to college in order to get a job?	41.7	0.88	0.91	0.27	0.23
[d_15]: Work outside the home immediately after leaving school?	40.8	0.91	0.92	0.30	0.23
[d_16]: Work outside the home before getting married?	38.3	0.91	0.91	0.40	0.17
<i>'What would most people in your community say if a...'</i>					
[i_1]: Woman works outside the home?	32.5	1.03	0.88	0.16	0.13
[i_2]: Woman works outside the home after getting married?	40.8	0.86	0.87	0.33	0.30
[i_3]: Woman works outside the home because she needs the money for daily household expenses?	41.7	0.84	0.87	0.05	0.05
[i_4]: Woman works outside the home because her husband is unwell?	53.9	0.59	0.73	0.32	0.26
[i_6]: Woman returns home from work every day after 7pm?	58.7	0.61	0.84	0.30	0.28
[i_8]: Woman works with men from other families?	53.4	0.65	0.80	0.33	0.25
[i_11]: Woman is the sole breadwinner for her family?	50.0	0.67	0.80	0.23	0.17
[i_13]: Girl works outside the home?	33.5	1.01	0.92	0.19	0.18
[i_14]: Girl goes to college in order to get a job?	45.1	0.75	0.79	0.32	0.27
[i_15]: Girl works outside the home immediately after leaving school?	39.3	0.96	0.95	0.16	0.15
[i_16]: Girl works outside the home before getting married?	39.3	0.94	0.94	0.30	0.29

delivering programs within the appropriate social network (Prentice & Paluck, 2020).

We discovered that the personal attitudes of adolescents towards women working were more positive than injunctive norm perceptions, especially among girls. If girls value complying with what others think more than following their own attitudes, this disjuncture could obstruct their

career aspirations (Bursztyn et al., 2018). The scale's ability to distinguish between attitudes and perceived norms enables us to identify such gaps and potential opportunities for norms-shifting interventions at this crucial juncture of adolescence.

No study is perfect and ours is no exception. First, we did not have measures such as future career choices that could

**Table 7. Summary of the different types of validity evidence examined to evaluate the scale**

Construct/Description	Type of Validation	Statistics	Interpretation
Two-Factor Structure of Social Norms Theory	Factor Structure	Exploratory factor analysis (and scree plot) indicates a two-factor solution.	The scale's two-factor solution was consistent with social norms theory i.e. descriptive and injunctive norms were two distinct sub-scales.
Cronbach's Alpha of Main Scale and Subscales	Internal Consistency	Main scale: 0.76 Descriptive norm subscale: 0.81 Injunctive norm subscale: 0.71	The scale items were adequately related, suggesting that they measured the same construct. Descriptive norm items and injunctive norm items also demonstrated congruence at the subscale level.
Social Norm Scores at Wave 1 and Wave 2 (3-week period)	Test-Retest Reliability	ICC: 0.50	The social norm score showed good stability, to produce similar scores if the same individual responded to the scale at a different point in time.
Global Personal Attitudes	Discriminant Validity	Pearson $r$ : 0.14	General gender attitudes were not strongly correlated with social norm perceptions, confirming that the scale did not measure broader beliefs about women working.
Local Personal Attitudes	Convergent and Discriminant Validity	Pearson $r$ : 0.31  Pearson $r$ , for high community identification sub-group: 0.36 Pearson $r$ , for low community identification sub-group: 0.18	Although personal attitudes towards the behaviors captured by the scale were more closely related to social norms scores than global attitudes, they still yielded distinct outcomes; even for individuals who strongly identified with their community. This suggests that the scale assesses second-order beliefs (norm perceptions), instead of first-order beliefs (attitudes).
Time Allocation to Work Outside the Home for Money	Convergent and Discriminant Validity	Pearson $r$ : 0.23	While the amount of time adolescents perceived female household members to spend working was associated with social norm perceptions, it was not identical. This implies that the scale is designed to measure a distinct construct beyond what can be observed within an individual's household.
Gender Differences in Social Norm Scores	Known-Groups Validity	Main scale: Girls (M=3.00), Boys (M=2.91)  Descriptive norm subscale: Girls (M = 2.94), Boys (M=2.66)  Injunctive norm subscale: Girls (M = 3.06), Boys (M=3.17)	Adolescent girls and boys exhibited differences on social norm scores. These differences align with previous findings at the social norm score level but contradict previous studies when it comes to the injunctive norm subscale. As a result, these findings do not strongly support or refute the validity of our scale.

serve as a strong criterion for predicting behavioral outcomes. Without prospectively following adolescents over a longer period of time, a precise estimation of how the strength of norms translates to actual labor market outcomes remains challenging. Second, we found lower item-level test-retest correlations, which can be noisier than scale aggregates and could explain this result. Yet, the result could suggest a need to strengthen our measurement at the item level. Third, despite the rarity and value of our under-studied sample of Indian adolescents in psychology and norms research, we did not have a separate validation sample to confirm the observed factor structure. This was unfeasible for us to obtain due to the prolonged closure of schools in the third Covid-19 wave during our retest sur-

vey data collection and ensuing budgetary limitations. This validation study will reveal whether the same factor structure, which is largely in alignment with social norms theory, replicates for a larger population of low-income adolescents. Finally, India is an enormously diverse country, culturally and economically, and we focused on one region, language, and age group. This might place a constraint on the generality of our results to other cultures in India. The extent to which our results can be extrapolated beyond the sample to the larger population of adolescents or older adults or other countries, however, is uncertain. While we observe that normative barriers to women's participation in the labor market can be shared across developing countries, attitudes toward female employment can exhibit vari-

ations even among countries at similar levels of economic development (Jayachandran, 2021). Some important concepts like the distribution of domestic work responsibilities (Deshpande & Kabeer, 2019) were not retained and could be more relevant for older populations. Addressing these four limitations is therefore a promising avenue for follow-up research.

## Conclusion

Inadequate measurement hampers our understanding of the determinants and outcomes of changing social norms (Costenbader et al., 2019). Researchers might want to evaluate the impact of a social-norm intervention to increase women's choice for gaining economic independence. Practitioners might want to decide when more intensive engagement is needed in situations of deeply entrenched socio-cultural structures versus using light-touch nudge-based messaging. The SSGN scale, including its subscales, shows strong psychometric properties and presents an easy-to-administer measure, for both these purposes.

---

## Data Accessibility Statement

Data, analysis code, and online appendix are made publicly available at <https://osf.io/puxfs/>. This study's analysis

was not pre-registered.<sup>1</sup> Data were analyzed using RStudio, version 4.1.2.

## Author Contributions

We describe contributions using the CRediT taxonomy. *Writing - Original Draft:* K.G.; *Writing - Review and Editing:* B.C., P.F., & K.G.; *Methodology:* K.G. & B.C.; *Funding Acquisition, Project Administration, Conceptualization, Investigation, Formal Analysis:* K.G.

## Acknowledgments

We are grateful to Breakthrough, for synergistic collaboration, and Nyas Research, for excellent field supervision. We thank: Anisha Singh for valuable mentorship; Nicholas Owsley for foundational guidance; Isabel Pastoor, Kaavya Aronkoni, and Kelvin Kihindas for research support; Rebecca Lundgren and Shailja Mehta for constructive input. This study received support from EMERGE, at the Center for Gender Equity and Health (GEH).

Submitted: July 15, 2022 PDT, Accepted: April 12, 2023 PDT



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CCBY-4.0). View this license's legal deed at <http://creativecommons.org/licenses/by/4.0> and legal code at <http://creativecommons.org/licenses/by/4.0/legalcode> for more information.

---

<sup>1</sup> We developed a pre-registration to meet Busara's open science policy, a note on which can be found on our OSF page.

## References

- Anukriti, S., Herrera-Almanza, C., Pathak, P. K., & Karra, M. (2020). Curse of the Mummy-ji: the influence of mothers-in-law on women in India. *American Journal of Agricultural Economics*, *102*(5), 1328–1351. <https://doi.org/10.1111/ajae.12114>
- Arias, E. (2019). How does media influence social norms? Experimental evidence on the role of common knowledge. *Political Science Research and Methods*, *7*(3), 561–578. <https://doi.org/10.1017/psr.m.2018.1>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596–612. <https://doi.org/10.1037/0022-3514.63.4.596>
- Baird, S., Bhutta, Z. A., Hamad, B. A., Hicks, J. H., Jones, N., & Muz, J. (2019). Do restrictive gender attitudes and norms influence physical and mental health during very young adolescence? Evidence from Bangladesh and Ethiopia. *SSM - Population Health*, *9*, 100480. <https://doi.org/10.1016/j.ssmph.2019.100480>
- Bursztyjn, L., González, A. L., & Yanagizawa-Drott, D. (2018). *Misperceived social norms: Female labor force participation in Saudi Arabia* (No. w24736). National Bureau of Economic Research. <https://doi.org/10.3386/w24736>
- Campaña, J. C., Giménez-Nadal, J. I., & Molina, J. A. (2018). Gender norms and the gendered distribution of total work in Latin American households. *Feminist Economics*, *24*(1), 35–62. <https://doi.org/10.1080/13545701.2017.1390320>
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, *1*(2), 245–276. [https://doi.org/10.1207/s15327906mbr0102\\_10](https://doi.org/10.1207/s15327906mbr0102_10)
- Cheryan, S., & Plaut, V. C. (2010). Explaining underrepresentation: A theory of precluded interest. *Sex Roles*, *63*(7–8), 475–488. <https://doi.org/10.1007/s11199-010-9835-x>
- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In *Advances in experimental social psychology* (Vol. 24, pp. 201–234). Academic Press. [https://doi.org/10.1016/s0065-2601\(08\)60330-5](https://doi.org/10.1016/s0065-2601(08)60330-5)
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 2, pp. 151–192). McGraw-Hill.
- Cislaghi, B., & Heise, L. (2018). Four avenues of normative influence: A research agenda for health promotion in low and mid-income countries. *Health Psychology*, *37*(6), 562–573. <https://doi.org/10.1037/hea0000618>
- Cislaghi, B., & Heise, L. (2019). Using social norms theory for health promotion in low-income countries. *Health Promotion International*, *34*(3), 616–623. <https://doi.org/10.1093/heapro/day017>
- Clark, C. J., Ferguson, G., Shrestha, B., Shrestha, P. N., Oakes, J. M., Gupta, J., McGhee, S., Cheong, Y. F., & Yount, K. M. (2018). Social norms and women's risk of intimate partner violence in Nepal. *Social Science & Medicine*, *202*, 162–169. <https://doi.org/10.1016/j.socscimed.2018.02.017>
- Clark, L. A., & Watson, D. (2019). Constructing validity: New developments in creating objective measuring instruments. *Psychological Assessment*, *31*(12), 1412–1427. <https://doi.org/10.1037/pas0000626>
- Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis*. Lawrence Erlbaum.
- Costenbader, E., Cislaghi, B., Clark, C. J., Hinson, L., Lenzi, R., McCarraher, D. R., McLarnon-Silk, C., Pulerwitz, J., Shaw, B., & Stefanik, L. (2019). Social norms measurement: Catching up with programs and moving the field forward. *Journal of Adolescent Health*, *64*(4), S4–S6. <https://doi.org/10.1016/j.jadohealth.2019.01.001>
- Costenbader, E., Lenzi, R., Hershov, R. B., Ashburn, K., & McCarraher, D. R. (2017). Measurement of social norms affecting modern contraceptive use: A literature review. *Studies in Family Planning*, *48*(4), 377–389. <https://doi.org/10.1111/sifp.12040>
- Das, S., Delavallade, C., Fashogbon, A., Ogunleye, W., & Papineni, S. (2021). *Occupational Sex Segregation in Agriculture*.
- Dempsey, R. C., McAlaney, J., & Bewick, B. M. (2018). A critical appraisal of the social norms approach as an interventional strategy for health-related behavior and attitude change. *Frontiers in Psychology*, *9*. <https://doi.org/10.3389/fpsyg.2018.02180>
- Deshpande, A., & Kabeer, N. (2019). *(In) visibility, care and cultural barriers: the size and shape of women's work in India* (Economics Discussion Paper 04/19; pp. 1–31). Ashoka University.
- DeVellis, R. F. (2003). *Scale development: theory and applications* (2nd ed.). Sage Publications.
- Dhar, D., Jain, T., & Jayachandran, S. (2022). Reshaping adolescents' gender attitudes: Evidence from a school-based experiment in India. *American Economic Review*, *112*(3), 899–927. <https://doi.org/10.1257/aer.20201112>
- Eagly, A. H., & Wood, W. (2012). Social role theory. In *Handbook of theories of social psychology* (Vol. 2, pp. 458–476). <https://doi.org/10.4135/9781446249222.n49>
- Field, E., Pande, R., Rigol, N., Schaner, S., & Troyer Moore, C. (2021). On her own account: How strengthening women's financial control impacts labor supply and gender norms. *American Economic Review*, *111*(7), 2342–2375. <https://doi.org/10.1257/aer.20200705>
- Fleiss, J. L. (1986). *The design and analysis of clinical experiments*. John Wiley & Sons.



- Fletcher, E., Pande, R., & Moore, C. M. T. (2017). *Women and work in India: Descriptive evidence and a review of potential policies*. India Policy Forum. <https://doi.org/10.2139/ssrn.3116310>
- Gauri, V., Rahman, T., & Sen, I. K. (2019). Measuring social norms about female labor force participation in Jordan. *World Bank Policy Research Working Paper, 8916*. <https://doi.org/10.1596/1813-9450-8916>
- GEH. (2020). *A roadmap for measuring agency and social norms in women's economic empowerment*. Center on Gender Equity and Health. <https://emerge.ucsd.edu/wp-content/uploads/2020/06/agency-and-social-norms-roadmap.pdf>
- Gelfand, M. J., Harrington, J. R., & Jackson, J. C. (2017). The strength of social norms across human groups. *Perspectives on Psychological Science, 12*(5), 800–809. <https://doi.org/10.1177/1745691617708631>
- Gorsuch, R. L. (1983). *Factor analysis*. Laurence Erlbaum Associates.
- Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin, 103*(2), 265–275. <https://doi.org/10.1037/0033-2909.103.2.265>
- Guilmoto, C. Z., Saikia, N., Tamrakar, V., & Bora, J. K. (2018). Excess under-5 female mortality across India: a spatial analysis using 2011 census data. *The Lancet Global Health, 6*(6), e650–e658. [https://doi.org/10.1016/s2214-109x\(18\)30184-0](https://doi.org/10.1016/s2214-109x(18)30184-0)
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis*. Pearson University Press.
- Holgado-Tello, F. P., Chacón-Moscoso, S., Barbero-García, I., & Vila-Abad, E. (2010). Polychoric versus Pearson correlations in exploratory and confirmatory factor analysis of ordinal variables. *Quality & Quantity, 44*(1), 153–166. <https://doi.org/10.1007/s11135-008-9190-y>
- International Institute for Population Sciences & ICF. (2021). *National Family Health Survey (NFHS-5), 2019–21. India: Volume I. IIPS*. <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>
- Jayachandran, S. (2021). Social norms as a barrier to women's employment in developing countries. *IMF Economic Review, 69*(3), 576–595. <https://doi.org/10.1057/s41308-021-00140-w>
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*(1), 31–36. <https://doi.org/10.1007/bf02291575>
- Kalpagam, U. (2008). Marriage norms, choice and aspirations of rural women. *Economic and Political Weekly, 53*–63.
- Lede, E., Meleady, R., & Seger, C. R. (2019). Optimizing the influence of social norms interventions: Applying social identity insights to motivate residential water conservation. *Journal of Environmental Psychology, 62*, 105–114. <https://doi.org/10.1016/j.jenvp.2019.02.011>
- Leite, W., & Beretvas, S. N. (2010). The performance of multiple imputation for Likert-type items with missing data. *Journal of Modern Applied Statistical Methods, 9*(1), 64–74. <https://doi.org/10.22237/jmasm/1272686820>
- Lent, R. W., Brown, S. D., & Hackett, G. (2002). Social cognitive career theory. *Career Choice and Development, 4*(1), 255–311.
- Martin, C. L., Wood, C. H., & Little, J. K. (1990). The development of gender stereotype components. *Child Development, 61*(6), 1891–1904. <https://doi.org/10.2307/1130845>
- Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist, 50*(9), 741–749. <https://doi.org/10.1037/0003-066x.50.9.741>
- National Sample Survey. (2018). *Key Indicators of Household Social Consumption on Education in India: NSS 75th Round (2017-2018)*. Ministry of Statistics & Programme Implementation, Government of India. [https://mospi.gov.in/sites/default/files/publication\\_reports/Report\\_585\\_75th\\_round\\_Education\\_final\\_1507\\_0.pdf](https://mospi.gov.in/sites/default/files/publication_reports/Report_585_75th_round_Education_final_1507_0.pdf)
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw Hill.
- Osborne, J. W. (2015). What is rotating in exploratory factor analysis? *Practical Assessment, Research, and Evaluation, 20*(1), 2.
- Perry, D. G., & Bussey, K. (1979). The social learning theory of sex differences: Imitation is alive and well. *Journal of Personality and Social Psychology, 37*(10), 1699–1712. <https://doi.org/10.1037/0022-3514.37.10.1699>
- Prentice, D., & Paluck, E. L. (2020). Engineering social change using social norms: Lessons from the study of collective action. *Current Opinion in Psychology, 35*, 138–142. <https://doi.org/10.1016/j.copsyc.2020.06.012>
- Rimal, R. N., & Real, K. (2005). How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. *Communication Research, 32*(3), 389–414. <https://doi.org/10.1177/0093650205275385>
- Rost, L. (2018). *Household Care Survey Questionnaire 2017*. Oxfam. <https://oxfamilibrary.openrepository.com/bitstream/handle/10546/620145/ml-household-care-survey-wecare-questionnaire-151116-en.pdf?sequence=3>
- Saxena, D. P. (1971). The “reference group” concept. *Social Science, 155*–164.
- Smith, J. R., Louis, W. R., Terry, D. J., Greenaway, K. H., Clarke, M. R., & Cheng, X. (2012). Congruent or conflicted? The impact of injunctive and descriptive norms on environmental intentions. *Journal of Environmental Psychology, 32*(4), 353–361. <https://doi.org/10.1016/j.jenvp.2012.06.001>
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Pearson.
- Tankard, M. E., & Paluck, E. L. (2017). The effect of a Supreme Court decision regarding gay marriage on social norms and personal attitudes. *Psychological Science, 28*(9), 1334–1344. <https://doi.org/10.1177/0956797617709594>

- Thalmayer, A. G., Toscanelli, C., & Arnett, J. J. (2021). The neglected 95% revisited: Is American psychology becoming less American? *American Psychologist*, 76(1), 116–129. <https://doi.org/10.1037/amp0000622>
- UNDP. (2020). *Tackling social norms: A game changer for gender inequalities*. [https://hdr.undp.org/sites/default/files/hd\\_perspectives\\_gsni.pdf](https://hdr.undp.org/sites/default/files/hd_perspectives_gsni.pdf)
- UNFPA. (2020). *How changing social norms is crucial in achieving gender equality*. [https://www.unfpa.org/sites/default/files/pub-pdf/WEB-UNFPASocial\\_Norms.pdf](https://www.unfpa.org/sites/default/files/pub-pdf/WEB-UNFPASocial_Norms.pdf)
- Waszak, C., Severy, L. J., Kafafi, L., & Badawi, I. (2001). Fertility behavior and psychological stress: The mediating influence of gender norm beliefs among Egyptian women. *Psychology of Women Quarterly*, 25(3), 197–208. <https://doi.org/10.1111/1471-6402.00021>
- Wazir, R. (2023). Social Norm Change, Behavioural Approaches and the Politics of Knowledge: A Conversation between the Ivory Tower and the Field. *Development and Change*, 54(1), 3–30. <https://doi.org/10.1111/dech.12731>
- Willis, G. B., & Artino, A. R., Jr. (2013). What do our respondents think we're asking? Using cognitive interviewing to improve medical education surveys. *Journal of Graduate Medical Education*, 5(3), 353–356. <https://doi.org/10.4300/jgme-d-13-00154.1>
- Wu, W., Jia, F., & Enders, C. (2015). A comparison of imputation strategies for ordinal missing data on Likert scale variables. *Multivariate Behavioral Research*, 50(5), 484–503. <https://doi.org/10.1080/00273171.2015.1022644>
- Yu, C., Zuo, X., Blum, R. W., Tolman, D. L., Kågesten, A., Mmari, K., De Meyer, S., Michielsen, K., Basu, S., Acharya, R., Lian, Q., & Lou, C. (2017). Marching to a different drummer: A cross-cultural comparison of young adolescents who challenge gender norms. *Journal of Adolescent Health*, 61(4), S48–S54. <https://doi.org/10.1016/j.jadohealth.2017.07.005>

## Supplementary Materials

### Review Responses

Download: [https://collabra.scholasticahq.com/article/75220-an-improved-measure-for-the-strength-of-social-gender-norms-ssgn-developed-for-adolescents-in-uttar-pradesh-india/attachment/158946.pdf?auth\\_token=jywSCxo8Cj6XAp1OcwX2](https://collabra.scholasticahq.com/article/75220-an-improved-measure-for-the-strength-of-social-gender-norms-ssgn-developed-for-adolescents-in-uttar-pradesh-india/attachment/158946.pdf?auth_token=jywSCxo8Cj6XAp1OcwX2)

---

### Peer Review History

Download: [https://collabra.scholasticahq.com/article/75220-an-improved-measure-for-the-strength-of-social-gender-norms-ssgn-developed-for-adolescents-in-uttar-pradesh-india/attachment/158947.docx?auth\\_token=jywSCxo8Cj6XAp1OcwX2](https://collabra.scholasticahq.com/article/75220-an-improved-measure-for-the-strength-of-social-gender-norms-ssgn-developed-for-adolescents-in-uttar-pradesh-india/attachment/158947.docx?auth_token=jywSCxo8Cj6XAp1OcwX2)

---