

Development and Validation of Gender Stereotype Scale

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Gender stereotype refers to the over generalization about the attributes and characteristics of individuals based on gender. Gender stereotypes in a society decide the roles of members based on their gender. To understand the various aspects of gender stereotype, a standardized gender stereotype scale is essential. But the number of gender stereotype scale is very less, especially in Indian context. The purpose of this current study is to develop and validate cultural adapted gender stereotype scale in the Indian context. A total number of 945 individuals were used in various phases of this research. Four factors were identified using exploratory factor analysis, Trans-phobia, Masculinity, Patriarchy and Femininity. After confirmatory factor analysis, 23 items were finalized with a good model fit. The internal consistency (α) of the proposed scale is 0.85 and the split half reliability score is 0.76. The face validity and content validity were established. Concurrent validity (0.40) was established using available standardized gender stereotype scale.

Keywords: gender stereotype; scale construction; reliability; validity; exploratory factor analysis; confirmatory factor analysis.

In everyday conversation, the term sex and gender are often used interchangeably. Sex refers to biological characteristics, such as sex chromosomes and sex organs (West & Zimmerman, 1987). But, gender refers to an individual's concept of themselves according to the social categories. Thus, though the terms provide similar meaning, they differ from one another at specific contexts. Precisely the concept of gender and gender role varies across geography, because gender is a human cultural creation (Garfinkel & Harold, 1967). Thus, gender roles and gender norms are different from one culture to another at least in few perspectives (Unger, 1979). Social interaction carries an essential role in developing one's gender concept. At the same time individuals express their gender identity when they interact with others, through their appearance, body language, tone of voice and behavior.

There exist plenty of theories to explain about gender development. For instance, cognitive developmental theories perceive gender as the outcome of cognitive maturation through gender identity, gender stability and gender consistency (Martin, Ruble & Szkrybalo,

2002). At the same time gender schema theory focuses on the schematic process which leads children to be sex-typed. This is due to the comparison between the self-concept and socially desired gender concept (Bem, 1981). Social cognitive theory explains about the process of three factors that shapes gender. The factors are: personal, behavioral and environmental. The social cognitive theory highlights on non-cognitive influences such as motivational, environmental and affective factors that accounts for gender development. The theory specifically emphasizes the role of modeling in learning gendered information (Bussy & Bandura, 1999).

Gender stereotype refers to the over generalization about the attributes and characteristics of individuals based on gender. This stereotype can be positive or negative. Most of the time stereotypes function as schemas, which are cognitive frameworks, for interpreting, organizing and recollecting information with no trouble (Whitley & Kite, 2016). One of the core reason people hold stereotypes is that, by doing so they can minimize the cognitive effort. Gender identity is a product of gender typing, that is, the

process by which children become aware of their gender. Once an individual accept their gender, they start to behave according to the norms and roles of the society which are appropriate to the identified gender. According to social learning theory, children learn gender characteristics through observation, imitation and modeling (Bandura, Ross & Ross 1963). Play carries an important role in the development process of the concept gender in children. Parents, peer group, school and the media are few strong pillars which lead the individual towards gender stereotype. Even though, stereotypes help to process information easier, sometimes the gender concepts may develop prejudice among people that ends in discrimination based on gender (Whitley & Kite, 2010). The biases towards certain gender category may result in unfavorable attitude towards the group. Individuals become sexist when they are biased towards people on the basis of gender.

Terman and Miles (1936) were the first to construct a scale to describe psychological femininity and masculinity. It was a product of years of investigation about the psychological differences between sexes. This scale consists of 445 items and 7 supplementary exercises which best discriminate women from men. Later, various researchers developed various scales related to concept gender with the same logic of Terman and Miles. Later, in 1973 Constantinople came with a different idea which totally changed the idea in the gender identity scale. According to Constantinople, the masculinity and femininity are not different entities, but co-exist. Her concept of uni-dimensionality in gender identity carried a crucial role to rethink about the existing gender construct. In the 1970s, the concept of androgyny has emerged in masculinity and femininity. Bem (1974) constructed a scale (BSRI) to identify sex role based on the psychological androgyny. Spence and Hlmreich (1972) constructed a scale to measure attitude towards women which is followed by the concept of androgyny. Bem and Spence perceive masculinity and femininity as two orthogonal constructs. Some other subsequent scales were, The structure of male role norms (Thompson & Pleck, 1986), Attitude towards sex roles: traditional or egalitarian (Larsen & Long

1988), Gender role belief scale (Kerr & Holden, 1996), Gender Stereotype Scale (Noorjahan & Shahataj, 2003), Indian gender role identity scale (Basu, 2010), the gender role stereotype scale (Mills, Culbertson, Huffman & Connell, 2012) and Teachers gender stereotype scale towards mathematics (Nurlu, 2017).

Though plenty of scales exist to measure gender role stereotype, there is no validated tool to measure gender stereotype. A scale by Noorjahan and Shahataj (2003) measures gender stereotype, but this scale only represents the response roles expected of women. Most scales regarding gender, gender role and gender role stereotype only discussed about male and female characteristics, whereas the present tool includes the stereotypes towards male, female and transgender. The gender stereotypes differ in different cultures of various societies. So it is very essential to develop a cultural specific tool to measure gender stereotype. The present tool is developed based on the Indian context, where number of tradition, rituals and cultures are accepted and followed by the people. The traditional gender roles in India, insist people to behave in certain ways, regardless of their willingness. And thus, gender stereotype questionnaire is very essential to find out the perpetuating factors of gender stereotype and to find the impact and influence of gender stereotype on other areas.

Method

Item generation

Generating items to measure gender stereotype is a little complex process, as it is spread out to various different aspects. For generating meaningful items, focus group discussions were conducted with 95 students from various disciplines. As per the discussion, 120 items were identified with the same procedure used by Spence et al (1975). Further, the existing literature and tools that focuses on various factors related to gender stereotype were also used to generate items. A total of 192 items were generated through the above processes. The linguistic content of the constructed items were checked by language experts. Later, the items were arranged in simple to complex form with a five point rating scale ranging from 1 to

5 (very relevant to not at all relevant) given to 10 psychology faculties and 10 social activists to verify whether the constructed items really measure gender stereotype. Majority of the panel (15) were satisfied with 87% of items. Few items were removed based on their opinion, and the items were reduced to pool of 167 items.

Participants and procedure

At various phases 945 individuals between the age range of 17 and 30 were used for this study. The samples belonged to under graduation and post-graduation studies. The sample comprise of students who differ based on religious background (Hindu, Christian, Muslim, atheist & no religion), area of living (Rural, Semi-Urban & Urban), gender (Male & Female) and stream of study (Science, Arts & Commerce). A questionnaire survey was conducted to collect the data from the respondents. The gender stereotype scale (GSS) were given to the participants after the clear instruction. A five point Likert- type scale was used to measure the response, ranging from 1 to 5 indicate strongly disagree, disagree, neutral, agree and strongly agree respectively. The responses were entered into the excel spreadsheet for further analysis. Before analysis, the data cleaning process was done to assure that the data is apt for the further analysis. IBM SPSS statistics version 24 was used for the analysis. Exploratory factor analysis, confirmatory factor analysis, reliability test, composite reliability and concurrent validity were tested.

Content validity

The final draft of 167 gender stereotype items was circulated to 17 experts to verify whether the constructed items really related to gender stereotype or not. Experts from the faculty of psychology (who works in social psychology), faculty of women studies, faculty of gender studies, social activists (who work in gender and its related area) and researchers (who work in gender stereotype) judged the items. After evaluating the expert's opinion, items which are slightly overlapping and the items having a tendency to misunderstand were eliminated. Finally, after all the above process, the number of items was reduced to 133 gender stereotype items.

Result and Discussion

Exploratory Factor Analysis

Exploratory factor analysis is one of the best methods to understand the underlying factors and its underlying structure. As, there were very less studies and established theories in gender stereotype, the researcher decided to go for exploratory factor analysis to find the dimensionality of proposed scale. For factor analysis 450 data were collected: out of it 434 complete data were used for further analysis. Before factor extraction, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test and Bartlett's test of Sphericity were used to assess whether the collected data is adequate enough to do the factor analysis (Chen, Zhao & Huang 2019).

Table 1 EFA result for Gender Stereotype Scale

Items	Factors			
	1	2	3	4
GS128	.759			
GS129	.747			
GS127	.736			
GS122	.680			
GS123	.622			
GS117	.579			
GS120	.569			
GS124	.555			
GS67		.675		
GS32		.611		
GS66		.598		
GS30		.536		
GS41		.536		
GS90		.517		
GS26		.484		
GS72		.482		
GS55		.461		
GS94		.432		
GS25		.421		
GS60		.403		
GS59			.512	
GS74			.506	

GS107	.489
GS58	.486
GS48	.482
GS6	.456
GS52	.442
GS5	.441
GS57	.436
GS50	.433
GS11	.403
GS100	.658
GS101	.647
GS97	.628
GS104	.616
GS81	.482
GS16	.440

The KMO value (0.90) shows that the data were adequate enough to use for factor analysis (Kaiser 1974). Bartlett's Test of Sphericity value (0.00, $p < 0.05$) shows the data is suitable to do further analysis (Balakrishnan & Griffiths 2018). Principal component analysis was used with Varimax rotation to identify the dimensionality of gender stereotype scale. In the initial phase, the items with a factor loading below 0.4 and cross loading above 0.5 were removed. The numbers of factors were determined based on eigenvalue and scree plot (Cattle 1966). In the first level of EFA (KMO= 0.81; Bartlett's test of Sphericity= 24108.386; $df = 8778$; $p < 0.001$) 52 items were identified with a factor loading of 0.3 and above. In the next round of EFA using the same method (KMO=0.901; Bartlett's test of Sphericity= 8089.888; $df = 1378$; $p < 0.001$), 9 items were dropped because the items were loaded lower than .40. Thus, four factors were identified with 43 items (table 1). The factors are named as trans-phobia, masculinity, patriarchy and femininity based on the commonality of items.

Confirmatory Factor Analysis

Confirmatory factor analysis is a type of structural equation analysis (Hinkin, Tracey, and Enz 1997). Confirmatory factor analysis was used to analyze the goodness of fit for the proposed model. The chi-square statistics

was used to assess the goodness of fit. The smaller chi-square value shows a better model fit. Goodness of fit index (GFI), root mean square error of approximation (RMSEA), root mean square residual (RMR) and standardized root mean square residual (SRMR) shows the absolute fit measures. The possible range of goodness of fit index (GFI) value is from 0.0 to 1.0. The higher value (> 0.90) indicates a better fit. The root mean square error of approximation (RMSEA) indicates how well a model fits a population. The low RMSEA (< 0.08) value shows a better fit (Hair, Black, Anderson & Tatham, 2014). Root mean square residual (RMR) is an average of the residuals. Standardized root mean square residual (SRMR) is a substitute statistics of root mean square residual (RMR). SRMR is more preferred than RMR because it is easier to interpret. The possible range of SRMR value is from 0.0 to 1.0. The SRMR value close to zero indicates a better fit and 0 is the perfect model fit (Hair, Black, Anderson & Tatham, 2014).

Comparative fit index (CFI) is one of the popular and best indexes in incremental fit indices. The possible value of CFI is from 0.0 to 1.0. The CFI value closer to 1.0 shows a good model fit. The CFI value greater than 0.90 considered as good model fit (Hair, Black, Anderson & Tatham, 2014). Tucker-Lewis index (TLI) is another index in incremental fit indices. The TLI shows the effect of model complexity, as does RMSEA. The possible range of TLI is from 0.0 to 1.0. Sometimes the TLI index value may go beyond this range. The value of TLI close to 1 indicates a better model fit (Brown 2014). Adjusted goodness of fit index (AGFI) is a widely used index in parsimony indices.

The GFI value falls from 0.0 to 1.0. The GFI value closer to 1.0 show a better model fit (Hinkin, Tracey & Enz, 1997). The normalized fit index (NFI) analyzes the chi-square of the hypothesized model and null model. The possible range of NFI is from 0.0 to 1.0. The NFI value close to 1.0 indicates a better fit (Hinkin, Tracey & Enz, 1997). Relative fit index (RFI) is another index in incremental fit indices. The RFI value close to 1.0 shows a better fit. Moreover, the local fit of the model was checked using average variance extracted (AVE) > 0.50 and

composite reliability (CR) >0.60 (Tran & Keng 2018). Table 2 indicates the factor loading in CFA, composite reliability (CR).

Table 2. CFA result for Gender Stereotype Scale

Factors	Factor loading	CR
Trans-phobia		0.73
GSS-128	0.73	
GSS-126	0.60	
GSS-131	0.66	
GSS-124	0.50	
GSS-116	0.45	
Masculinity		0.71
GSS-67	0.52	
GSS-32	0.56	
GSS-30	0.50	
GSS-41	0.55	
GSS-26	0.52	
GSS-55	0.54	
Patriarchy		0.70
GSS-11	0.48	
GSS-57	0.45	
GSS-52	0.52	
GSS-48	0.46	
GSS-74	0.50	
GSS-59	0.56	
GSS-49	0.54	
Femininity		0.75
GSS-81	0.56	
GSS-104	0.57	
GSS-97	0.63	
GSS-101	0.64	
GSS-100	0.68	

Note. CR= Composite Reliability. The four dimensions of gender stereotype scale are trans-phobia, masculinity, patriarchy and femininity.

Confirmatory factor analysis is used to confirm the model which is discovered after exploratory factor analysis. CMIN, DF, CMIN/DF (chi-square/degree of freedom), root mean square (RMR), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), relative fit index (RFI), incremental fit index (IFI), Tucker-Lewis index (TLI), Comparative fit index (CFI), Root mean square error of approximation (RMSEA) and Standardized root mean square residual (SRMR) were used as model fit indices.

Table 3. Model fit indices for first and second order.

Model fit indices	First order	Second order
CMIN	403.94	421.55
DF	224	226
CMIN/DF	1.803	1.86
RMR	0.06	0.06
GFI	0.92	0.92
AGFI	0.90	0.90
NFI	0.82	0.81
RFI	0.80	0.79
IFI	0.91	0.90
TLI	0.90	0.89
CFI	0.91	0.90
RMSEA	0.04	0.04
SRMR	0.05	0.05

The model fit indices values in the first order are: CMIN= 403.94, DF= 224, CMIN/DF= 1.80, RMR= 0.06, GFI= 0.92, AGFI= 0.90, NFI= 0.82, RFI= 0.80, IFI= 0.91, TLI= 0.90, CFI= 0.91, RMSEA= 0.04 and SRMR= 0.05. The model fit indices values in the second order are: CMIN= 421.55, DF= 226, CMIN/DF= 1.86, RMR= 0.06, GFI= 0.92, AGFI= 0.90, NFI= 0.81, RFI= 0.79, IFI= 0.90, TLI= 0.89, CFI= 0.90, RMSEA= 0.04 and SRMR= 0.05.

Wheaton, Muthen, Alwin, & Summers (1977) suggested that the value of CMIN/DF less than 5.0 is acceptable for model fit. Hence, the CMIN/DF value for first and second order is acceptable. According to Brown (2006) the RMSEA value less than 0.08 is consider as the criteria. The

Table 4. Factors and corresponding items

Factor	Items					
Trans Phobia	4	8	12	16	20	
Masculinity	3	7	11	15	19	22
Patriarchy	2	6	10	14	18	21 23
Femininity	1	5	9	13	17	

Note. The number of item representing in each dimension.

value for normed fit index (NFI), incremental fit index (IFI), Comparative fit index (CFI), goodness of fit index (GFI), and for adjusted goodness of fit index (AGFI), the value above 0.90 is considered as a good fit (Hair et al., 1998; Tran & Keng 2018). Tucker-Lewis index (TLI) value for a good fit is >0.90 (Widaman 1985). Table 3 indicates the model fit indices for first and second order. The result indicates that the proposed model shows a good model fit. Thus, the model is confirmed. The derived factors and the items corresponding to each factors is given in table 4.

Reliability and Validity

Internal consistency (Cronbach alpha) is one of the widely used methods to establish reliability. After factor analysis, the final 23 items of GSS scale were computed to find the internal consistency. The internal consistency (α) for the 23 items of GSS scale was found to be 0.85 (Table-5). According to Nunnally, alpha reliability value above 0.70 is considered as adequate reliability (Yang & Green, 2011). Further, split half reliability method was also used to test reliability. To test the split half reliability, the GSS items were divided in to two groups (odd numbered items and even numbered items) and the items were given to the participants. The internal consistency reliability was calculated by computing split-half reliability using Spearman-Brown formula. The split half value is 0.76 (Table-5). The inter construct correlation shows significant (<0.05, table-6). The composite reliability (CR) score of GSS constructs lies from 0.70 to 0.75 (Table-2), which indicates an adequate reliability (Chen, Zhao & Huang 2019). The total composite reliability (CR) of GSS scale is 0.91. The above values indicate that the GSS has sufficient internal consistency. Thus the GSS

scale is found to be reliable.

Table 5. Reliability statistics

Type of reliability	Chronbach alpha (α)
Internal consistency	0.85
Split half method	0.76

Note. Internal consistency and Split half method indicates the reliability of the scale. The value more than 0.70 consider as a good reliability.

Table 6. Construct Correlations (Pearson Correlation Coefficient)

	Femininity	Patriarchy	Masculinity
Trans-phobia	0.37*	0.32*	0.36*
Masculinity	0.30*	0.50*	
Patriarchy	0.56*		

*p <0.05

The face validity and content validity of the scale were established in the initial stage of GSS construction. The further analysis was done after evaluating the face validity and content validity of GSS. Further, the concurrent validity was assessed. Gender Stereotype Scale developed by Noorjahan & Shahataj (2003) was used to establish the concurrent validity of GSS. The correlation value of these two scales was found to be 0.40 (Table-7). According to Anastasi (2007) the correlation value of 0.40 is considered as a high correlation between two scales.

Il the 23 items in the GSS are positive statements. The responses ranges from 1 to 5, indicating strongly disagree, disagree, neutral, agree and strongly agree respectively. The

minimum score one could obtain GSS is 23 and the maximum score is 115. The low score in GSS indicates a less gender stereotype and an egalitarian attitude towards gender. The high score of GSS indicates a high gender stereotype and a conservative attitude towards gender.

Table 7. Concurrent validity statistics.

Measure	Pearson's Correlation
GSS	
Gender Stereotype Scale (Noorjan & Shahataj 2003)	0.40*

*p < 0.05

Delimitation

Sample is restricted to only undergraduate and postgraduate students.

Equal number of participants from different religious and cultural background could have been taken.

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Appendix 1

SI. NO	ITEMS	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Women should not spend money without husband's approval.					
2	Virginity is more important for a woman than for a man.					
4	Men have more socialization skills.					
4	Transgenders have no emotional maturity.					

5	It is not fair for a woman to spend money for her parents without getting permission from her husband.
6	Husbands have the rights to often force wives to have sex with them even if they are not interested.
7	Men are better at making financial decisions.
8	Transgenders have AIDS and other sexually transmitted diseases.
9	Women should not laugh louder.
10	A young girl should not be given much freedom as boys enjoy.
11	Boys need sports activities for their physical and psychological development more than girls.
12	There are only two group of gender- male and female.
13	It is wrong for a woman to go out after midnight.
14	Long hair for women and short hair for men are the appropriate hair style.
15	Women are not capable of taking risks as men are.
16	A transgender woman can't rear a child like a mother.
17	A women should not attempt to take up all kinds of typically male tasks
18	Women should cook and do house work.
19	Men are mentally stronger than women
20	Transgenders cannot lead a normal life.
21	Women are responsible for raising children.
22	Men are ready to take any risks.
23	Husbands should be more educated than their wives.