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Nikita Mehta  
Hansika Kapoor

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# VALIDATING TOOLS TO MEASURE LIFE SKILLS AMONG ADOLESCENTS IN INDIA

## Validating Tools to Measure Life Skills Among Adolescents in India

**Nikita Mehta**

Department of Psychology, Monk Prayogshala, Mumbai, India

**Hansika Kapoor**

Department of Psychology, Monk Prayogshala, Mumbai, India  
Neag School of Education, University of Connecticut, Storrs, USA

Address correspondence to Hansika Kapoor at [hk@monkprayogshala.in](mailto:hk@monkprayogshala.in)

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## **Validating Tools to Measure Life Skills Among Adolescents in India**

### **Abstract**

Life skills education is critical for developing various competencies among the adolescent population, especially in India where recent policy focus has shifted to them. The current paper examines the reliability, factor structure, and the validity of the gender attitudes, perceived self-efficacy, resilience, and problem-solving scales developed to measure the effectiveness of a life skills program among Indian adolescents. Baseline data, before a life skills intervention program by Magic Bus India Foundation, were collected from over 16,000 Indian adolescents between 11-15 years on different measures. Results from principal component analyses with promax rotation indicated a one-factor solution for all the scales. Further, confirmatory factor analyses indicated an excellent model fit using the diagonally weighted least squares (DWLS) method of estimation for the abovementioned scales. The models for each scale were gender invariant, indicating gender attitudes, perceived self-efficacy, resilience, and problem solving were assessed similarly between boys and girls. Additionally, correlation analysis indicated a positive relationship between gender attitudes and self-efficacy, a negative relation between gender attitudes and resilience, and a negative association between self-efficacy and resilience.

*Keywords:* life skills; factor analysis; measurement invariance; secondary education

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

### Validating Tools to Measure Life Skills Among Adolescents in India

#### 1. Introduction

According to UNICEF (2019), “life skills are a set of abilities, attitudes as well as socio-emotional skills that enable individuals to learn, make informed decisions, and exercise rights leading to a healthy and productive life” (p. 7). Adolescence is a stage of identity formation, during which attitudes towards socialization, gender equality, and human rights consolidate (UNICEF, 2019); thus, life skills education among adolescents is especially important in India as social and class structures can often limit their opportunities (UNICEF, 2019).

The National Education Policy (NEP) that aims for a holistic development of a child has included critical life skills as one of the programs in the curriculum framework for adult education (NEP, 2020). It also states the importance of life skills such as, communication, cooperation, teamwork, and resilience in the Indian education system going forward (NEP, 2020).

Resilience and problem solving are a part of the 12 core life skills, according to the Life Skills and Citizenship Education framework (LSCE; UNICEF MENA, 2017). Additionally, individual agency, self-efficacy, and motivation to use life skills are important across all the 12 life skills (Hoskins & Liu, 2019). In developing countries, there is a big gender gap where women and girls have fewer educational opportunities, less autonomy in terms of marriage and fertility, and restrictions in workforce participation (Jayachandran, 2015). A study by Dhar et al. (2020) found that an attitude-change intervention among schools in Haryana, India was successful in making adolescent (average age, 12 years) attitudes and behavior more gender-equal. Thus, including gender attitudes in life skill interventions is important in the context of an Indian population.

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

Life skills training is conducted depending on the demands of a particular setting (Nasheeda et al., 2019). In developing countries (like India, Sri Lanka, Bangladesh), life skills education is conducted at different grade levels sequentially that include, everyday skills (such as, communication skills), health and social issues skills, and life skills in relation to risk behaviors (like drugs and smoking; WHO, 1993, as cited in Nasheeda et al., 2019).

Previous studies show the effect of life skills education on problem solving, resilience, and self-efficacy of adolescents. It has been found that adolescents (11-19 years) who perceive themselves as highly efficient in displaying empathy and problem solving were also high on resilience (Sagone et al., 2020). In another study, it was found that highly self-efficient early-adolescents (14-18 years) in terms of problem solving, scholastic performance, and empathy were more resilient as compared to low self-efficient adolescents (Sagone & De Caroli, 2016). Another study by Sagone and Indiana (2017) found that adolescents (15-19 years) having high positive affect reported having high perceived self-efficacy in life skills, and reached a high level of resilience. Additionally, another study indicated that general self-efficacy predicted resilience among middle adolescents in the ninth and tenth grade (Pooley & Cohen, 2010).

Research has shown that life skills training helped reduce psychological distress among adolescent students (Ghasemian & Kumar, 2017) and improve mental well-being among adolescents with psychosocial problems (Azeez, 2015). Furthermore, a study by Hita and Kumar (2017) indicated a reduction in emotional distress and improvement in emotional health in adolescents due to life skills training. Life skills training also increases adaptability and psychological well-being of married female students (Sadati et al., 2019). Given the increased need and importance of life skills education for adolescents in India, measures to assess its effectiveness are essential.

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

Gender role attitudes can be understood as a point of view held by individuals regarding the roles of men and women in a society (van der Horst, 2014). Perceived self-efficacy reflects an optimistic self-belief (Schwarzer, 1992). It can be understood as a belief that one can perform novel or difficult tasks or even cope with adversity in the various areas of functioning. According to the LSCE framework, resilience can be understood as the constructive and personal ability of an individual to navigate changing circumstances successfully (UNICEF MENA, 2017). Additionally, the LSCE framework defines problem solving as an ability to think through steps that lead to a desired outcome by identifying and understanding a problem and devising a solution for it (UNICEF MENA, 2017). These variables make up an important part of life skills. As most of the measures for life skills have been developed for OECD (Organization for Economic Co-operation & Development) countries, the cultural differences in life skills are under researched (Hoskins & Liu, 2019).

A report by Evaldesign, India (Bapna, 2019) noted the landscape of life skills education for adolescents in India. Of the various organizations implementing life skills education for adolescents in India, the study also evaluated the Magic Bus 'Childhood to Livelihood program.' This life skills intervention involved an in-school program and community intervention with a specific focus on gender. The program involved a focus on problem solving, communication, learning to learn, teamwork, perceived self-efficacy, and resilience of adolescents (Bapna, 2019). Given the wide focus of the program, the current paper examines the reliability, factor structure, and the validity of the gender attitudes, perceived self-efficacy, resilience, and problem-solving scales developed to measure the effectiveness of the life skills program by Magic Bus among Indian adolescents. In recent years, life skills education is gaining importance in the Indian context and the current study will help to validate certain tools to measure different life skills among adolescents in India.

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

### 2. Method

#### Participants

Data were collected from Indian adolescents between the ages of 11- 15 years before the life skills intervention, to evaluate the effectiveness of the life skills education program conducted by Magic Bus India Foundation. This baseline data was collected from 12 distinct sites at which the NGO is active, across the states of Andhra Pradesh, Assam, Chhattisgarh, Karnataka, Maharashtra, Madhya Pradesh, New Delhi, Himachal Pradesh, Rajasthan, Tamil Nadu, and West Bengal between 2016 and 2019. Data were collected in local languages: Hindi, Assamese, Marathi, Tamil, Telugu, Kannada, and Bengali. The scales were developed to measure the participant's baseline scores on gender attitudes, self-efficacy, resilience, and problem solving before taking part in the life skills education program.

A total of 11,536 Indian adolescents completed the survey for the gender attitudes, general self-efficacy, resilience scales and 4,677 adolescents completed the survey for the problem-solving scale. After cleaning the data for inconsistencies, a total of 10,587 adolescents for the gender attitudes, general self-efficacy, and resilience scales and a sample of 4,652 adolescents for the problem-solving scale were included in the study. The sample decreased further due to missing values for a few variables.

#### Procedure

The constructs of gender attitudes, perceived self-efficacy, resilience, and problem solving were measured to evaluate the effectiveness of the life skills education program conducted by Magic Bus. The survey including the above-mentioned scales was circulated among Indian adolescents that were a part of the life skills education program. All the scale items were developed in English and accompanied by their Marathi translations.

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

### Measures

#### Gender Attitudes

The scale consisted of 7 items scored on a 4-point Likert scale (1 = *fully agree* to 4 = *fully disagree*). A sample item for the scale is “Teachers should encourage boys to take more classes in science and mathematics as compared to girls”. Higher aggregate scores on the gender attitudes scale indicated more liberal gender attitudes and lower scores were associated with conservative gender attitudes. For this data sample, the gender attitudes scale had a satisfactory internal consistency reliability ( $\alpha = 0.75$ ).

#### General Self-Efficacy

This scale was developed by Schwarzer & Jerusalem (1995). It is a 10-item scale rated on a 4-point Likert scale (1 = *strongly agree* to 4 = *strongly disagree*). A sample item for the scale is “I can always manage to solve difficult problems if I try hard enough”. This index was reverse scored. High cumulative scores indicated higher perceived self-efficacy. For the current sample, the general self-efficacy scale had a good internal inconsistency reliability ( $\alpha = 0.89$ ).

#### Resilience

The scale comprises 12 items rated along a 3-point Likert scale (1 = *no*, 2 = *sometimes*, 3 = *yes*). A sample item for the scale is “I try to finish activities that I start”. Higher aggregate scores were associated with higher resilience among individuals. The resilience scale ( $\alpha = 0.93$ ) was found to have an excellent internal consistency reliability.

#### Problem Solving

The scale consisted of 8 items along a 4-point Likert scale (1 = *strongly agree* to 4 = *strongly disagree*). A sample item of the scale is “I easily identify my problems”. This index was reverse scored.



## VALIDATING TOOLS TO MEASURE LIFE SKILLS

Higher cumulative scores indicated better problem-solving ability. The data for this scale were only available for five studies, of which one study had data on only five items. Thus, its use was restricted in subsequent analyses. The problem-solving scale ( $\alpha = 0.78$ ) had a satisfactory internal consistency reliability.

### Data Analysis

RStudio software was used for data analysis (RStudio team, 2021). The data were initially cleaned for non-numeric and inconsistent values. Next, the dataset was divided into two parts; one was used for exploratory factor analysis (EFA) while the other half was used for computing confirmatory factor analysis (CFA; Fokkema & Greiff, 2017). Next, the internal consistency reliability was measured for each scale for this sample. Later, one of the datasets was tested for the assumption of normal distribution. Finally, EFA and CFA were computed for each scale. The factor loadings and scree plots were examined to evaluate the factor structure of the scales for the EFA. For the factor models, fit was measured by evaluating the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), in order to determine optimal fit. Additionally, measurement invariance for gender was also computed for all the models.

## 3. Results

### Exploratory Factor Analyses

To explore the factor structure of the scales, principal component analysis (PCA) with promax rotation was computed. The data of 5,713 participants was considered for the gender attitudes, general self-efficacy, resilience scales and 2,328 participants for the problem-solving scale. The results

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

revealed that most of the items in the scales, namely, gender attitudes (see Table 1), general self-efficacy (see Table 2), resilience (see Table 3), and problem solving (see Table 4), loaded onto one factor. Specifically, the one factor solution of the gender attitudes scale explained 41% of the variance ( $SS$  loadings= 2.88), general self-efficacy explained 51% of the variance ( $SS$  loadings= 5.1), resilience explained 60% of variance ( $SS$  loadings= 7.24), and problem solving explained 41% of variance ( $SS$  loadings= 3.28). The scree plots also indicate the one factor structure for the general self-efficacy (see Figure 2), resilience (see Figure 3) and problem solving (see Figure 4) scales.

**Table 1**

*Principal Component Analysis (PCA) with Promax rotation- Factor Loadings for Gender Attitudes scale*

Item Statement	One factor model loading	Two factor model loadings	
		Factor 1 Loadings	Factor 2 Loadings
	A father's job is to earn money for the family, and a mother's job is to look after family.	0.54	
A wife needs permission from her husband if she wants to go to the market.	0.57		0.82
Having a male headmaster/ principal at school better than a female.	0.70	0.59	

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

Teachers should encourage boys to take more

classes in science and mathematics as compared to

0.62

0.65

girls.

Religious leaders should always be men.

0.73

0.83

Community leaders should always be men.

0.73

0.89

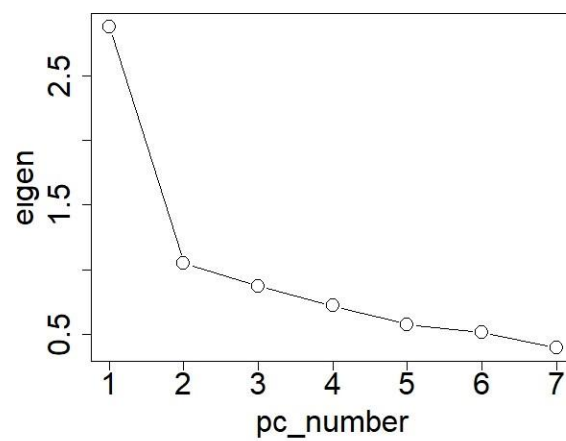
Parents should give dowry for their girl's marriage.

0.56

0.44

**Figure 1**

*Scree plot for Gender Attitudes scale*



## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Table 2**

*Principal Component Analysis (PCA) with Promax rotation- Factor Loadings for General Self-efficacy scale*

Item Statement	One factor	Two factor model	
	model loading	loadings	
		Factor 1	Factor 2
		Loadings	Loadings
I can always manage to solve difficult problems if I try hard enough.	0.69		0.56
If someone opposes me, I can find means and ways to get what I want.	0.65		0.96
It is easy for me to stick to my aims and accomplish my goals.	0.67		0.76
I am confident that I could deal efficiently with unexpected events.	0.75	0.6	
Thanks to my resourcefulness, I know how to handle unforeseen situations.	0.73	0.53	
I can solve most problems if I invest the necessary effort.	0.74	0.62	
I can remain calm when facing difficulties, because I can rely on my coping abilities.	0.71	0.84	

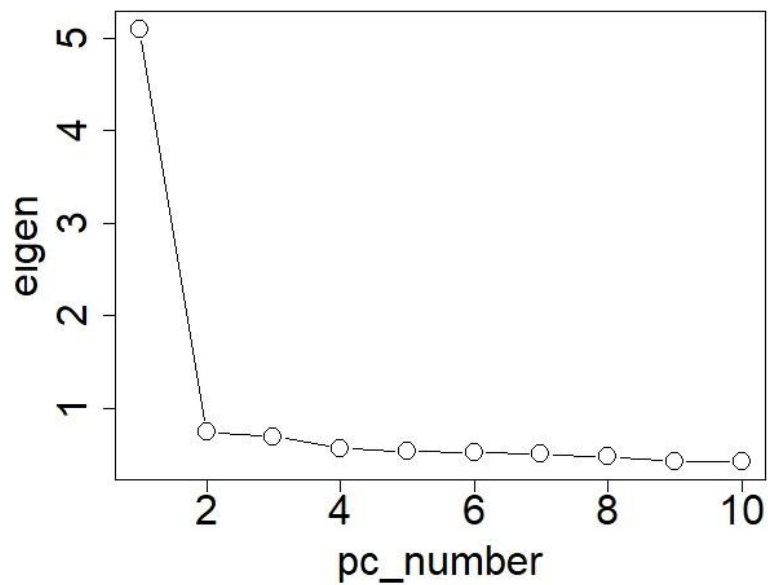
## VALIDATING TOOLS TO MEASURE LIFE SKILLS

When I am confronted with a problem, I can usually find several solutions.	0.74	0.8
If I am in trouble, I can usually think of something to do.	0.71	0.84
No matter what comes my way, I'm usually able to handle it.	0.75	0.80

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**Figure 2**

*Scree plot for General self-efficacy scale*



## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Table 3***Principal Component Analysis (PCA) with Promax rotation- Factor Loadings for Resilience scale*

Item Statement	One factor model loading	Two factor model loadings	
		Factor 1 Loadings	Factor 2 Loadings
	I have people I want to be like.	0.51	
Getting an education is important to me.	0.87	0.91	
I feel that my parent(s)/ caregiver(s) know a lot about me (for example, who my friends are, what I like to do).	0.83	0.77	
I try to finish activities that I start.	0.81	0.64	
When things don't go my way, I can fix it without hurting myself or other people (for example hitting others or saying nasty things).	0.61		0.60
I know where to go to get help.	0.67		0.60
I feel that I belong at my school.	0.84	0.85	
I think my family cares about me when times are hard (for example if I am sick or have done something wrong).	0.86	0.96	

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

I think my friends cares about me when times are

hard (for example if I am sick or have done 0.75 0.63

something wrong).

I am treated fairly. 0.85 0.86

I have chances to learn things that will be useful

when I am older (like cooking, working and helping 0.77 0.75

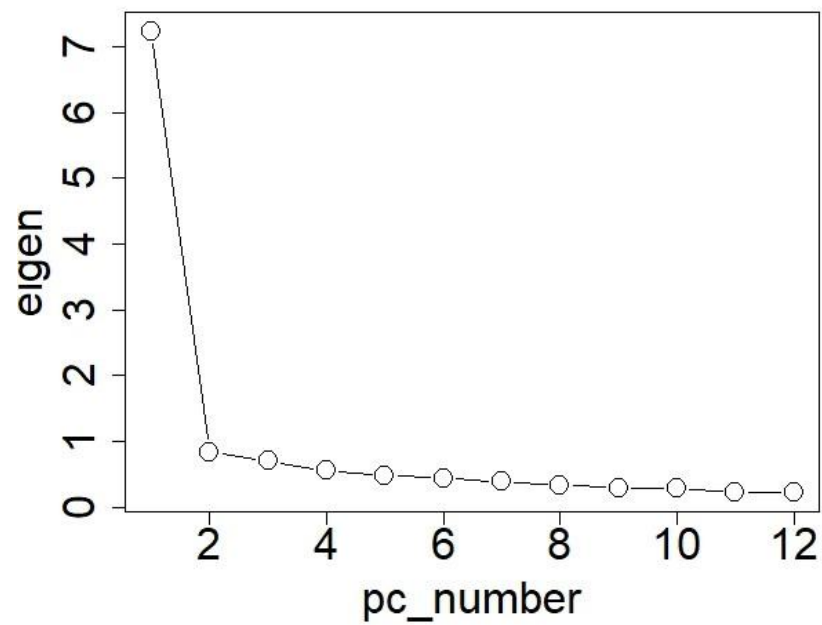
others).

I like the way my community celebrates things (like 0.86 0.97

holidays, festivals).

**Figure 3**

*Scree plot for Resilience scale*



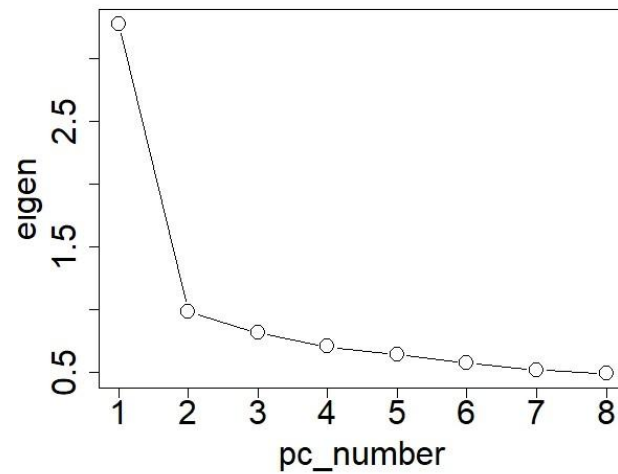
## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Table 4***Principal Component Analysis (PCA) with Promax rotation- Factor Loadings for Problem solving scale*

Item Statement	One factor model loading	Two factor model loadings	
		Factor 1 Loadings	Factor 2 Loadings
	I easily identify my problems.	0.64	0.68
I look for information to help me understand the problem.	0.72	0.62	
I think about ways of dealing with my problem.	0.71	0.90	
I discuss choices with my friends before making a decision.	0.62	0.48	
I discuss choices with my parents before making a decision.	0.61	0.82	
I look for positive points of possible choices.	0.70	0.54	
I look for negative points of possible choices.	0.42		1.04
Before making any other decision, I think about how the last one turned out.	0.64		0.44



## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Figure 4***Scree plot for Problem solving scale***Table 5***Principal Component Analysis (PCA) with Promax rotation- One- factor model*

Scales	SS	Proportion
	loadings	variance
Gender attitudes	2.88	0.41
General self-efficacy	5.10	0.51
Resilience	7.24	0.60
Problem-Solving	3.28	0.41

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Table 6***Principal Component Analysis (PCA) with Promax rotation- Two- factor model*

Scales	SS loadings		Proportion variance		Cumulative variance	
	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
Gender attitudes	2.39	1.53	0.34	0.22	0.34	0.56
General self-efficacy	3.83	2.02	0.38	0.20	0.38	0.58
Resilience	6.24	1.84	0.52	0.15	0.52	0.67
Problem-Solving	2.89	1.37	0.36	0.17	0.36	0.53

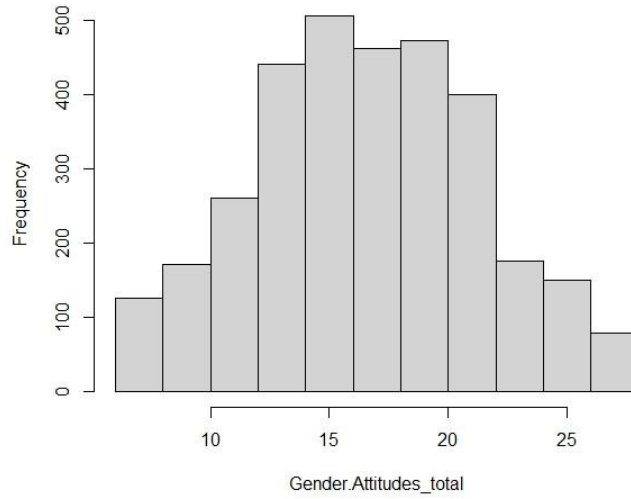
**Normality Analysis**

The Shapiro-Wilk test of normality was computed on the dataset (see Table 5). Gender attitudes ( $W= 0.99, p= 0.00$ ), general self-efficacy ( $W= 0.97, p= 0.00$ ), resilience ( $W= 0.74, p= 0.00$ ), and problem solving ( $W= 0.97, p= 0.00$ ) were not normally distributed. The histogram plots show a skewed data set for general self-efficacy (see Figure 6), resilience (see Figure 7) and problem solving (see Figure 8) scales.

# VALIDATING TOOLS TO MEASURE LIFE SKILLS

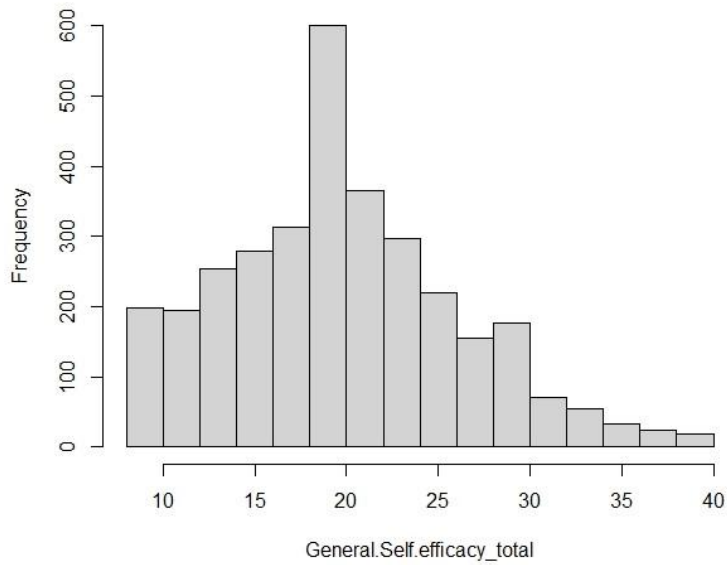
**Figure 5**

*Histogram plot for Gender attitudes*

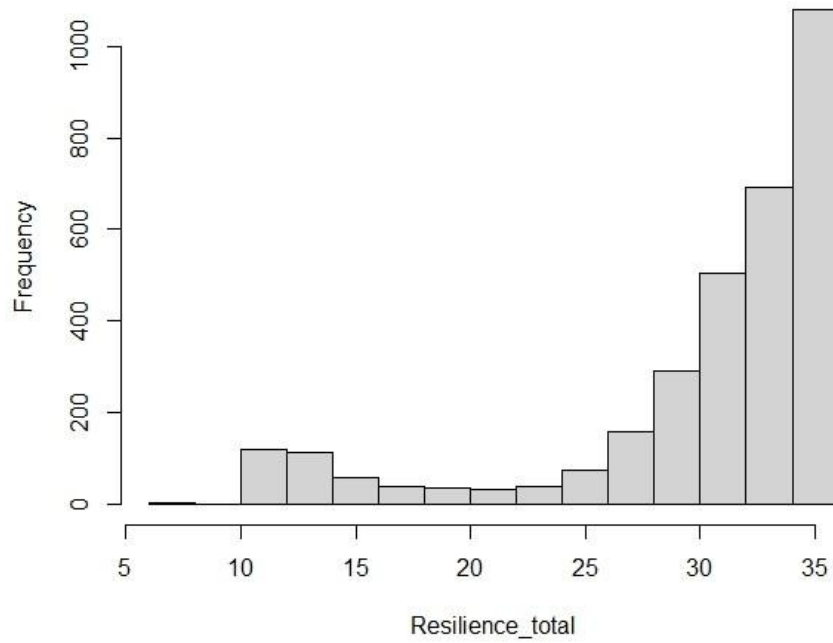
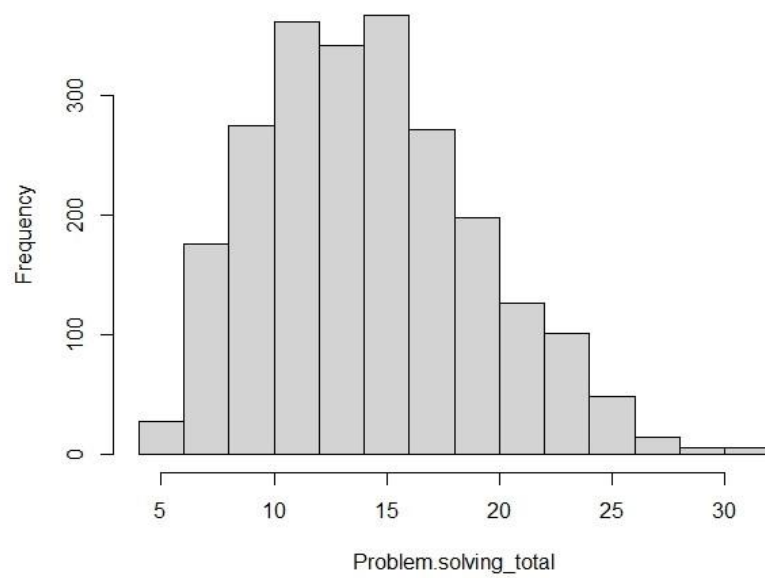


**Figure 6**

*Histogram plot for General self-efficacy*



## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Figure 7***Histogram plot for Resilience***Figure 8***Histogram plot for Problem solving*

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

### Confirmatory Factor Analyses

Subsequently, confirmatory factor analysis (CFA) was also computed on the above-mentioned scales (see Table 7). The data of 5,717 participants was considered for the gender attitudes, general self-efficacy, resilience scales and 2,324 participants for the problem-solving scale. Using the ML (Maximum Likelihood) method of estimation, the gender attitudes scale did not show a good fit. However, general self-efficacy, resilience, and problem solving had a good model fit. Because the data did not follow a normal distribution, the DWLS (Diagonally Weighted Least Squares) method of estimation was used in order to achieve best overall fit indices. For gender attitudes, using DWLS led to an adequate model fit while, general self-efficacy, resilience, and problem solving had an excellent model fit.

**Table 7:** *One-factor Confirmatory Factor Analysis using Maximum Likelihood (ML) and Diagonally Weighted Least Squares (DWLS) methods*

Scales	N	Estimation	$\chi^2$	df	$\chi^2/df$	CFI	TLI	RMSEA	SRMR
Gender attitudes	5716	ML	730.66 ***	14	52.19	0.85	0.77	0.13	0.07
		DWLS	778.66 ***	14	55.62	0.95	0.93	0.13	0.08
General self-efficacy	5716	ML	431.76 ***	35	12.34	0.97	0.96	0.06	0.03
		DWLS	306.50 ***	35	8.76	1.00	1.00	0.05	0.03
Resilience	5716	ML	677.42 ***	54	12.54	0.98	0.97	0.06	0.03
		DWLS	110.17 ***	54	2.04	1.00	1.00	0.02	0.02
	2324	ML	389.04 ***	20	19.45	0.90	0.86	0.10	0.05

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

Problem-								
Solving	DWLS	140.60 ***	20	7.03	0.97	0.96	0.06	0.05

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\*\*\*  $p < .001$

### Measurement Invariance

In addition to the CFA, measurement invariance for all the scales was assessed across gender (see Table 8). Measurement invariance was computed to examine whether the scales had the same measurement properties across two or more groups (Fischer & Karl, 2019). Using the most robust statistics to measure between-group invariance,  $\Delta CFI \leq 0.01$  (Cheung & Rensvold, 2002) will be considered instead of the  $\Delta\chi^2$  due to its sensitivity to sample size (Cheung & Rensvold, 2002; Chen, 2007).

Based on the results of the gender attitudes (see Table 8), general self-efficacy (see Table 9), resilience (see Table 10), and problem-solving scales (see Table 11), the change in CFI for model 2 vs model 1, model 3 vs model 2, and model 4 vs model 3 indicates invariance between boys and girls. This suggests that association between items and the latent traits of individuals for all the scales, did not depend on group membership (here, gender).

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Table 8** *Measurement Invariance across gender for Gender Attitudes scale*

Gender attitudes	$\chi^2$ (df)	$\Delta\chi^2$	RMSEA	$\Delta$ RMSEA	CFI	$\Delta$ CFI
Model 1 (Configural Invariance)	738.27 (28)	NA	0.13	NA	0.85	NA
Model 2 (Metric Invariance)	751.55 (34)	13.28	0.12	0.010	0.84	0.00 2
Model 3 (Scalar Invariance)	823.71 (40)	72.15	0.11	0.004	0.83	0.010 0.00
Model 4 (Structural Invariance)	846.29 (47)	22.59	0.10	0.008	0.83	0.00 3

\*\*\*  $p < .001$

**Table 9***Measurement Invariance across gender for General Self-efficacy scale*

General self-efficacy	$\chi^2$ (df)	$\Delta\chi^2$	RMSEA	$\Delta$ RMSEA	CFI	$\Delta$ CFI
Model 1 (Configural Invariance)	461.90 (70)	NA	0.06	NA	0.97	NA
Model 2 (Metric Invariance)	484.94 (79)	23.05	0.06	0.003	0.97	0.001
Model 3 (Scalar Invariance)	498.44 (88)	13.50	0.06	0.003	0.97	0.00 0
Model 4 (Structural Invariance)	511.25 (98)	12.81	0.05	0.003	0.97	0.00 0

\*\*\*  $p < .001$

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**Table 10***Measurement Invariance across gender for Resilience scale*

Resilience	$\chi^2$ (df)	$\Delta\chi^2$	RMSEA	$\Delta$ RMSEA	CFI	$\Delta$ CFI
Model 1 (Configural Invariance)	800.82 (108)	NA	0.06	NA	0.97	NA
Model 2 (Metric Invariance)	820.48 (119)	19.66	0.06	0.003	0.97	0.00 0
Model 3 (Scalar Invariance)	863.09 (130)	42.61	0.06	0.001	0.97	0.001
Model 4 (Structural Invariance)	968.34 (142)	105.25	0.06	0.001	0.97	0.00 3

\*\*\*  $p < .001$ **Table 11***Measurement Invariance across gender for Problem solving scale*

Problem-Solving	$\chi^2$ (df)	$\Delta\chi^2$	RMSEA	$\Delta$ RMSEA	CFI	$\Delta$ CFI
Model 1 (Configural Invariance)	451.80 (40)	NA	0.10	NA	0.8 9	NA
Model 2 (Metric Invariance)	476.31 (47)	24.51	0.10	0.006	0.8 8	0.005
Model 3 (Scalar Invariance)	514.03 (54)	37.72	0.09	0.003	0.8 8	0.008
Model 4 (Structural Invariance)	543.60 (62)	29.57	0.09	0.004	0.87	0.006

\*\*\*  $p < .001$



## VALIDATING TOOLS TO MEASURE LIFE SKILLS

### Descriptive statistics and correlation

The datasets for all the scales were merged and to compute descriptive statistics and correlations. It was observed that among the total sample, 17.06 was the mean gender attitudes ( $SD = 4.80$ ), 20.19 was the average self-efficacy ( $SD = 6.27$ ), 30.63 was the mean resilience ( $SD = 6.71$ ), and the mean problem-solving ability was 14.81 ( $SD = 4.88$ ). Further, the correlations indicated that liberal gender attitudes were positively related to self-efficacy ( $r = 0.05, p < .01$ ) and negatively related to resilience ( $r = -0.03, p < .05$ ). Resilience was negatively related to self-efficacy ( $r = -0.14, p < .01$ ). As data for the problem-solving scale was from a separate sample it was not included in the correlation analysis.

A total of 5105 boys and 5477 girls responded to the items of the gender attitudes, resilience, and self-efficacy scales. Among boys, there was a significant negative relationship between self-efficacy and resilience (Table 12). Whereas, among girls, liberal gender attitudes were positively related to self-efficacy and negatively related to resilience; resilience was negatively related to self-efficacy (Table 13).

**Table 12**

*Descriptive statistics and correlation matrix for the relationship between scales among boys*

Variable	<i>M</i>	<i>SD</i>	1	2
1. Gender attitudes	16.39	4.82		

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

2. Self-efficacy	20.35	6.33	0.03	
3. Resilience	30.24	6.99	0.01	-0.08**

Note. \*\*  $p < .01$ .

**Table 13**

*Descriptive statistics and correlation matrix for the relationship between scales among girls*

Variable	<i>M</i>	<i>SD</i>	1	2
1. Gender attitudes	17.65	4.70		
2. Self-efficacy	20.04	6.22	0.07**	
3. Resilience	31.01	6.38	-0.08**	-0.20**

Note. \*\*  $p < .01$ .

#### 4. Discussion

In India, caste, gender, poverty, and location create barriers for many young individuals to realize their potential. A strong focus on developing life skills among adolescents in India can help empower adolescents and transform them into responsible citizens. Taking the complex and diverse contexts of India, life skills can be useful to elicit empowerment, active participation, recognize their power and potential, promote social inclusion, and equal opportunities for all (UNICEF, 2019).

This paper assesses the reliability and validity of the gender attitudes, general self-efficacy, resilience, and problem-solving scales developed to measure these variables among adolescents in

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

India before the implementation of a life skills education program by the Magic Bus India Foundation. The results indicated that all the scales had good reliability. Additionally, the findings from exploratory factor analyses indicated that all the scales had a one-factor solution. Further, confirmatory factor analyses indicated a good model fit for the abovementioned scales. Thus, the results indicated that the scales are reliable and valid measures of gender attitudes, general self-efficacy, resilience and problem solving respectively and were invariant measures between boys and girls. Furthermore, significant correlations between liberal gender attitudes, general self-efficacy, and resilience indicated that the scales taken together might be useful in assessing and imparting life skills among adolescents. These unidimensional scales are useful measures for the specified constructs among adolescents in India.

Past studies have shown that life skills have been helpful in improving adolescents' mental health (Azeez, 2015) and reducing psychological (Ghasemian & Kumar, 2017) and emotional distress (Hita & Kumar, 2017). Studies have shown that building life skills among adolescent girls foster decision making ability, mobility, sense of efficacy, and access to resources (World vision, n.d., as cited in Bapna, 2019). Furthermore, including gender attitudes as a part of life skills education might help overcome the gender inequality in India. Given the effectiveness of life skills education and training among adolescents, validation of appropriate tools for measuring the efficacy of the life skills program in India has its implications for future use.

The analysis also revealed a negative correlation between self-efficacy and resilience. This rather unlikely result might point to the impact of participants' social environment (largely from a lower socioeconomic background) on building resilience. Research has noted a significant relationship between socio demographics and resilience variables (Barends, 2004). It also highlights the

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

importance of imparting life skills among adolescents to increase knowledge and foster self-efficacy and resilience together, along with other skills. Gender attitudes on the other hand were positively related to self-efficacy indicating the importance of having liberal gender attitudes, especially among girls. Further, gender attitudes were negatively associated with resilience suggesting the need for life skills training for Indian adolescents.

Self-efficacy, resilience, and problem solving are among the many basic life skills important among adolescents. Measuring certain life skill abilities gives policy makers as well as practitioners to track progress of programs as well as inform scope of useful interventions. Further, these tools also help researchers in identifying sub-groups who need more support and learning of these life skills (Hoskins & Liu, 2019). Thus, the measures evaluated in this study, namely gender attitudes, general self-efficacy, resilience, and problem solving can be useful to measure the effectiveness of a life skills program among the adolescent population.

According to the LSCE (Life Skills and Citizenship Education) framework, there are 12 core life skills namely, creativity, critical thinking, problem solving, cooperation, negotiation, decision making, self- management, resilience, communication, respect for diversity, empathy and participation (UNICEF and partners, 2017). Thus, future efforts can be made to develop tools that measure the various different important life skills specifically designed to assess the effectiveness of the life skill education programs among adolescents in India.

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

**References**

Annual Status of Education Report (Rural) 2017. (2018). *Beyond basics*.

<http://img.asercentre.org/docs/Publications/ASER%20Reports/ASER%202017/aser2017fullreportfinal.pdf>

Azeez E.P., A. (2015). Positive mental health through life skill education: Empowering adolescents having psychosocial problems. *Journal of Psychosocial Research*, 10(1), 21-31.

Barends, M.S. (2004). *Overcoming adversity: an investigation of the role of resilience constructs in the relationship between socio-economic and demographic factors and academic coping* (Master's mini thesis). University of the Western Cape. Retrieved from:  
[http://etd.uwc.ac.za/xmlui/bitstream/handle/11394/259/Barend\\_MPSYCH\\_2004.pdf?sequence=1&isAllowed=y](http://etd.uwc.ac.za/xmlui/bitstream/handle/11394/259/Barend_MPSYCH_2004.pdf?sequence=1&isAllowed=y)

Bapna, A. (2019). Co-creating tools for measuring the impact of life skills on adolescents insights from a scoping study in India. *Echidna Giving*.

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504.  
<https://doi.org/10.1080/10705510701301834>

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. [https://doi.org/10.1207/S15328007SEM0902\\_5](https://doi.org/10.1207/S15328007SEM0902_5)

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

- Dhar, S., Jain, T., & Jayachandran, S. (2018). *Reshaping adolescents' gender attitudes: Evidence from a school-based experiment in India* (NBER Working Papers 25331). National Bureau of Economic Research. <http://www.nber.org/papers/w25331>
- Fischer, R., & Karl, J. A. (2019). A primer to (cross-cultural) multi-group invariance testing possibilities in R. *Frontiers in Psychology*, 1507. <https://doi.org/10.3389/FPSYG.2019.01507>
- Fokkema, M., & Greiff, S. (2017). How performing PCA and CFA on the same data equals trouble. *European Journal of Psychological Assessment*, 33(6), 399–402. <https://doi.org/10.1027/1015-5759/A000460>
- Ghasemian, A., & Kumar, V. (2017). Effect of life skills training on psychological distress among male and female adolescent students. *Indian Journal of Health and Wellbeing*, 8(4), 279-282.
- Hita, C., & Kumar, G.V. (2017). Effect of life skills training on emotional distress: A comparative study between adolescent boys and girls. *The International Journal of Indian Psychology*, 5(1). DOI: 10.25215/0501.018
- Hoskins, B., & Liu, L. (2019). *Measuring life skills in the context of life skills and citizenship education in the Middle East and North Africa: United Nations Children's Fund (UNICEF) and the World Bank*. [https://www.unicef.org/mena/media/7011/file/Measuring%20life%20skills\\_web.pdf.pdf](https://www.unicef.org/mena/media/7011/file/Measuring%20life%20skills_web.pdf.pdf)
- Jayachandran, S. (2015). The roots of gender inequality in developing countries. *The Annual Review of Economics*, 7, 63–88. <https://doi.org/10.1146/annurev-economics-080614-115404>

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

Ministry of human resource development. (2020). *National Education Policy 2020*. Government of India.

Nasheeda, A., Abdullah, H.B., Krauss, S.E., & Ahmed, N.B. (2019). A narrative systematic review of life skills education: effectiveness, research gaps and priorities. *International Journal of Adolescence and Youth*, 24(3), 362-379. <https://doi.org/10.1080/02673843.2018.1479278>

Pooley, J. A., & Cohen, L. (2010). Resilience: A definition in context. *The Australian Psychological Society*, 22(1), 30–37. <https://www.semanticscholar.org/paper/Resilience%3A-A-Definition-in-Context-Pooley-Cohen/ce7e75a6fe215592636d531abb5dfe3bd32dc12d>

RStudio Team. (2021). RStudio: Integrated development environment for R. RStudio, PBC, Boston, MA. <http://www.rstudio.com/>.

Sadati, S.Z., Mirzaian, B., & Doosti, Y. (2019). The effect of basic life skills training on adaptability and psychological well-being in married female students. *International Clinical Neuroscience Journal*, 6(1), 28-32. DOI:10.15171/ICNJ.2019.06

Sagone, E., De Caroli, M. E., Falanga, R., & Indiana, M. L. (2020). Resilience and perceived self-efficacy in life skills from early to late adolescence. *International Journal of Adolescence and Youth*, 25(1), 882–890. <https://doi.org/10.1080/02673843.2020.1771599>

Sagone, E., & Indiana, M. L. (2017). The relationship of positive affect with resilience and self-efficacy in life skills in Italian adolescents. *Psychology (Special Issue Developmental Psychology)*, 8, 2226–2239. <https://doi.org/10.4236/psych.2017.813142>

## VALIDATING TOOLS TO MEASURE LIFE SKILLS

- Sagone, E., & De Caroli, M. E. (2016). Are value priorities related to dispositional optimism and resilience? A correlational study. *Contemporary Educational Researches Journal*, 6(1), 11–20.  
<https://doi.org/10.18844/cerj.v6i1.481>
- Schwarzer, R., & Jerusalem, M. (1995). Generalized self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, UK: NFER-NELSON. <http://userpage.fu-berlin.de/~health/engscal.htm>
- UNICEF MENA. (2017). *Reimagining life skills and citizenship education in the Middle East and North Africa: A four-dimensional and systems approach to 21st century skills*.  
<https://www.unicef.org/mena/reports/reimagining-life-skills-and-citizenship-education-middle-east-and-north-africa>
- UNICEF. (2019). *Comprehensive life skills framework rights based and life cycle approach to building skills for empowerment*.
- van der Horst M. (2014). Gender role attitudes. In: Michalos A.C. (eds) *Encyclopedia of Quality of Life and Well-Being Research*. Springer, Dordrecht. [https://doi.org/10.1007/978-94-007-0753-5\\_1135](https://doi.org/10.1007/978-94-007-0753-5_1135)