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# Reliability and Validity of the Adopted Bengali Versioned Self-Concept Inventory

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**Abstract**
The research aimed to standardize Beena Shah's Self-Concept Inventory (SCI) to better align with the cultural nuances of Bengali students. The study incorporated 576 adolescents aged 14 to 16 from 9th and 10th grades in South 24 Parganas. The validity of each item in the Bengali adaptation of the SCI was confirmed through item analysis. Construct validity was evaluated using subscales-total correlation for convergent validity and inter-subscales correlation for discriminant validity. The reliability of the scale was assessed using Cronbach's alpha and split-half reliability coefficients, both of which showed high values of 0.918 and 0.917, respectively. The findings indicated that the adapted Bengali version of Beena Shah's Self-Concept Inventory is a reliable and valid instrument for assessing self-concept in Bengali adolescents and adults.

**Keywords:** Self-Concept, Adolescents, Bengali adaptation, Beena Shah's Self-Concept Inventory (SCI), Reliability, Validity

## 1. Introduction

Every person always perceives themselves as a unique entity, often referred to as "I," "me," or "myself." Self-concept (SC) encompasses a person's perception of themselves. According to **Rogers (1959)**, the self or self-concept is a comprehensive construct that includes the understanding of "I" or "me" in relation to others and various life aspects, emphasizing the value of these elements. **Cooley (1902)** likened the self to a mirror's reflection, with the mirror representing others. **Rogers (1951)** established the foundation for the self-concept by defining personal identity as distinct from others. Self-image includes notions such as self-esteem, self-evaluation, and self-ideal. **Harter (1999)** described self-esteem as a measure derived from environmental interactions. **Shavelson, Hubner, and Stanton (1976)** asserted that self-concept evolves through experiences and interpretations influenced by the environment, including the expectations

of significant individuals like parents and teachers. The self-concept is characterized by its integrative, multifaceted, hierarchical, stable, developmental, evaluative, and diverse nature.

**Cooley (1909)** distinguished three types of consciousness: personal, social, and public. **Hurlock (1974)** described self-concept as encompassing perceptual (physical), conceptual (mental), and attitudinal components. **Sood (2006)** defined self-concept as the perception of one's physical, social, emotional, and academic abilities, including beliefs and values about oneself. **Saraswat (1984)** categorized self-concept into physical, social, emotional, academic, intellectual, and moral dimensions.

In the self-concept model proposed by **Shavelson, Hubner, and Stanton (1976)**, the highest level of the self-concept hierarchy is the general or global self-concept, which is further divided into academic and non-academic components. The non-academic self-concept encompasses social, emotional, and physical dimensions. Within the academic self-concept (ASC) category, self-concepts are subdivided into specific subjects such as English, history, mathematics, and science. The Marsh/Shavelson academic self-concept model specifically divides ASC into mathematics/academic self-concept and verbal/academic self-concept (**Marsh & Shavelson, 1985; Marsh, 1990**). The concept of academic self refers to an individual's identification and evaluation of their learning skills, incorporating attitudes, thoughts, beliefs, and understandings about academic performance, based on school experiences and feedback (**Marsh, Byrne, & Shavelson, 1988**). Additionally, **Skaalvik (1997)** distinguishes between the declarative/evaluative and emotional/motivational aspects of the academic self-concept.

The Self-Concept Inventory (SCI), created by Dr. Beena Shah, consists of 62 adjectives spread across 10 subscales as detailed in Table 3. Reliability, which measures the consistency and stability of a tool over time and across different populations, was assessed specifically for each demographic group within the sample, including gender and location (urban and rural). The finalized version of the SCI was administered to a randomly selected group of 325 adults (190 males and 135 females, with 180 from urban areas and 145 from rural areas). Responses were evaluated based on a five-point scale reflecting the degree to which the adjectives represented a positive or negative self-concept.

To determine the split-half reliability of the SCI for each subgroup, the Spearman-Brown formula was utilized. The reliability coefficients for the different dimensions and the overall test were calculated and are displayed in Table 1.

**Table-1: Area-wise split-half reliability coefficients of SCI**

| | SSC | ESC | PSC | CSC | ASC | PISC | JRSC | SC | SCRBT | SCRPT | Composite |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Male (N=190) | 0.76 | 0.65 | 0.71 | 0.62 | 0.58 | 0.74 | 0.81 | 0.76 | 0.68 | 0.79 | 0.82 |
| Female (N=135) | 0.69 | 0.71 | 0.68 | 0.59 | 0.61 | 0.71 | 0.75 | 0.69 | 0.67 | 0.89 | 0.79 |
| Urban (N=180) | 0.58 | 0.62 | 0.65 | 0.68 | 0.66 | 0.72 | 0.76 | 0.64 | 0.71 | 0.74 | 0.76 |
| Rural (N=145) | 0.62 | 0.65 | 0.70 | 0.69 | 0.63 | 0.69 | 0.72 | 0.74 | 0.71 | 0.69 | 0.70 |
| Total (N=325) | 0.59 | 0.61 | 0.73 | 0.67 | 0.64 | 0.71 | 0.77 | 0.72 | 0.70 | 0.78 | 0.77 |

The reliability coefficients, which ranged from 0.50 to 0.82, were highly significant (well below the 0.001 level of significance), indicating that the test was extremely reliable. This detailed reliability analysis ensured the SCI's applicability and accuracy across diverse groups within the sample.

Validity in the Self-Concept Inventory (SCI) was comprehensively established through multiple dimensions. Content validity was enhanced by the extensive inclusion of adjectives that covered nearly all critical aspects of self, with expert consensus on the appropriateness of dimensions and adjective relevance further reinforcing this aspect. *Intrinsic validity* was evidenced by high split-half reliability coefficients, indicating a significant level of accuracy in measuring self-concept. *Construct validity* was confirmed through the analysis of intercorrelations among the ten areas of the SCI, detailed in Table 2, where correlation coefficients between different dimensions and between composite and individual dimensions significantly exceeded the .001 level of significance. The meticulous selection of items based on their discriminative ability, retaining only those with a high discriminability index, also significantly boosted the construct validity of the inventory.

**Table-2: Correlation matrix for the different areas of SCI (N=325)**

| Areas of Self | SSC | ESC | PSC | CSC | ASC | PoSC | JRSC | SC | SCRBT | SCRPT | Composite |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SSC | | 0.69 | 0.43 | 0.41 | 0.52 | 0.31 | 0.61 | 0.54 | 0.57 | 0.60 | 0.71 |
| ESC | | | 0.45 | 0.39 | 0.57 | 0.34 | 0.58 | 0.49 | 0.31 | 0.62 | 0.69 |
| PSC | | | | 0.52 | 0.54 | 0.49 | 0.52 | 0.49 | 0.50 | 0.58 | 0.54 |
| CSC | | | | | 0.42 | 0.45 | 0.64 | 0.71 | 0.49 | 0.61 | 0.65 |
| ASC | | | | | | 0.41 | 0.63 | 0.62 | 0.58 | 0.65 | 0.69 |
| PoSC | | | | | | | 0.71 | 0.78 | 0.62 | 0.69 | 0.74 |
| JRSC | | | | | | | | 0.72 | 0.58 | 0.64 | 0.68 |
| SC | | | | | | | | | 0.54 | 0.51 | 0.56 |
| SCRBT | | | | | | | | | | 0.61 | 0.58 |
| SCRPT | | | | | | | | | | | 0.70 |
| Composite | | | | | | | | | | | |

In the conducted study, researchers utilized Beena Shah's Self-Concept Inventory (SCI) to evaluate the reliability and validity of self-concept among Bengali-speaking school-going adolescents.

### 1.1 Rationale of the study

The main goal of the study was to validate the cultural appropriateness, linguistic accuracy, and psychometric reliability of the Bengali version of Beena Shah's Self-Concept Inventory (SCI) for

assessing self-concept among Bengali-speaking participants. This adaptation and translation process was crucial for maintaining the integrity of psychological assessment tools when used in different linguistic and cultural contexts. It ensured that the results obtained from the translated version were comparable to those from the original version and accurately reflected the construct being measured.

### 1.2 Objectives of the study

The objectives of the study were

1. To test the different types of validity of the Bengali versioned Beena Shah's Self-Concept Inventory (SCI) with the help of item analysis and other techniques.
2. To test the reliability of the Bengali versioned Beena Shah's Self-Concept Inventory (SCI) with the help of Split-Half and Cronbach's alpha determining method (internal consistency).

## 2. Methodology

### 2.1 Participants

To ensure a representative sample, a multiphasic stratified random sampling technique was used. In this study, 576 school-going adolescents aged 14-16 years, enrolled in the 9th and 10th grades, were randomly selected from 10 Bengali medium Government Sponsored Secondary and Higher Secondary Schools in the South 24 Parganas District of West Bengal.

### 2.2 Tools used

#### 2.2.1 Self Concept Inventory (SCI) – Shah (1986)

Dr. Beena Shah developed the Self-Concept Inventory (SCI) scale, which consists of 62 items (adjectives) and 10 subscales. Respondents use a 5-point Likert-type scale (Always, Often, Occasionally, Seldom, and Never) to rate their agreement with each item. Scores are averaged within each subscale, with higher scores indicating higher levels of self-concept in each dimension.

**Table-3: The distribution of items in different dimensions of SCI**

| Sl. | Dimensions of SCI | Items |
|---|---|---|
| 1. | Social Self-Concept (SSC) | 8 |
| 2. | Emotional Self-Concept (ESC) | 13 |
| 3. | Physical Self-Concept (PSC) | 3 |
| 4. | Cognitive Self-Concept (CSC) | 6 |
| 5. | Aesthetic Self-Concept (ASC) | 4 |
| 6. | Political Self-Concept (PoSC) | 5 |
| 7. | Job-Related Self-Concept (JRSC) | 9 |
| 8. | Self-Confidence (SC) | 4 |
| 9. | Self-Concept Related to Beliefs and Traditions (SCRBT) | 5 |
| 10. | Self-Concept Related to Personality Traits (SCRPT) | 5 |
| 11. | Composite Self-Concept | 62 |

### 2.3 Adaptation Process of Translated Bengali Versions of Beena Shah's Self-Concept Inventory (SCI)

A team of experts, including researchers, psychologists, and linguists, translated the original English version of Dr. Beena Shah's Self-Concept Inventory (SCI) test into Bengali. The goal was to adapt the vocabulary and grammar to suit the age and socio-cultural characteristics of the Bengali-speaking population. The translation process emphasized capturing the conceptual content and ensuring linguistic and psychological equivalence with the original, rather than a strict literal translation. The translation-retranslation method was employed, involving two rounds of translation and a re-translation back to English. A third group of experts reviewed both the original English version and the re-translated English version to identify any differences and suggest adjustments to the Bengali version.

### 2.4 Standardization of the Bengali Versions of the SCI

The Bengali versions of the Self-Concept Inventory were given to a representative sample of 576 school-going adolescents. Following this, the tests were standardized, and the reliability and validity were assessed using SPSS software on the participants' each-item response sheets.

## 3. Results

### Item Analysis

The item analysis had two main objectives: identifying items that would contribute consistently to the scale and eliminating items that did not meet this criterion. This involved analyzing data from 576 participants using the Likert Method (**Edwards, 1957**). The process involved sorting response sheets by total scores and then selecting the top 27% and bottom 27% of participants (155 individuals in each group) to represent the high and low groups, respectively. T-tests were then used to evaluate each item's ability to discriminate between these groups. Items with statistically significant t-values (p-value < 0.05 or t-value > 1.96) were deemed effective in distinguishing between the groups. The item analysis of the Bengali version of the test indicated that all items were valid, and these are presented in Table 4. The distribution of the 62 items across the ten dimensions matched that of the original English version of the test.

**Table-4: Item Analysis on the Adopted Bengali Versioned Self-Concept Inventory (SCI)**

| Serial No. (Facets) | t-value | Item-total Correlation | Serial No. (Facets) | t-value | Item-total Correlation |
|---|---|---|---|---|---|
| **1.** JRSC | 11.93 | 0.49 | **32.** CSC | 11.31 | 0.49 |
| **2.** ESC | 10.41 | 0.46 | **33.** CSC | 18.22 | 0.69 |
| **3.** CSC | 10.35 | 0.48 | **34.** SC | 10.85 | 0.47 |
| **4.** SSC | 11.00 | 0.48 | **35.**SC | 12.13 | 0.49 |
| **5.** SC | 11.05 | 0.47 | **36.**ESC | 4.81 | 0.25 |
| **6.** CSC | 6.24 | 0.32 | **37.**POSC | 7.74 | 0.38 |
| **7.** SSC | 10.41 | 0.47 | **38.**SSC | 5.92 | 0.26 |
| **8.** JRSC | 10.27 | 0.48 | **39.**JRSC | 14.10 | 0.55 |
| **9.** ESC | 16.53 | 0.55 | **40**.POSC | 7.46 | 0.30 |

| | | | | | |
|---|---|---|---|---|---|
| **10.** POSC | 6.00 | 0.31 | **41.**PSC | 9.67 | 0.41 |
| **11.**SCRPT | 8.36 | 0.37 | **42.**POSC | 2.41 | 0.25 |
| **12.** ESC | 5.49 | 0.27 | **43.**JRSC | 18.06 | 0.69 |
| **13.** SCRPT | 14.89 | 0.62 | **44.**ASC | 5.05 | 0.26 |
| **14.** SSC | 1.97 | 0.25 | **45**.ASC | 11.15 | 0.46 |
| **15.** ESC | 7.41 | 0.34 | **46.**SCRBT | 2.76 | 0.27 |
| **16.** PSC | 6.49 | 0.32 | **47.**SSC | 7.28 | 0.38 |
| **17.** ESC | 12.09 | 0.53 | **48.**SSC | 4.36 | 0.22 |
| **18.** SCRPT | 16.75 | 0.61 | **49.**SCRBT | 10.71 | 0.44 |
| **19.** CSC | 11.82 | 0.52 | **50.**ESC | 2.46 | 0.26 |
| **20.** SCRBT | 8.97 | 0.35 | **51.**ESC | 10.44 | 0.46 |
| **21.** POSC | 12.34 | 0.46 | **52.**SCRBT | 4.69 | 0.24 |
| **22.** JRSC | 17.59 | 0.66 | **53.**JRSC | 9.45 | 0.39 |
| **23.**SCRPT | 15.85 | 0.65 | **54.**ASC | 3.78 | 0.27 |
| **24.** SCRPT | 14.24 | 0.49 | **55**.JRSC | 9.54 | 0.44 |
| **25.** ESC | 11.82 | 0.48 | **56.**ESC | 6.83 | 0.27 |
| **26.** ESC | 11.82 | 0.45 | **57.**ESC | 10.22 | 0.43 |
| **27.**CSC | 12.37 | 0.48 | **58.**JRSC | 9.22 | 0.42 |
| **28.** SCRBT | 10.85 | 0.50 | **59.**SSC | 15.30 | 0.61 |
| **29.** PSC | 14.39 | 0.50 | **60.**ESC | 12.48 | 0.52 |
| **30.** SSC | 8.78 | 0.42 | **61.**ASC | 7.21 | 0.36 |
| **31.** JRSC | 11.37 | 0.53 | **62.**SC | 15.09 | 0.59 |

## A. Validity

### Construct Validity

The validity of the Bengali version of Beena Shah's Self-Concept Inventory (SCI) was confirmed through cross-validation techniques. Researchers evaluated convergent validity by calculating correlations between various SCI dimensions and the total scale score. The results, which were significantly higher than the 0.01 level of significance, showed strong correlations ranging from 0.544 to 0.888, as detailed in Table 5. Additionally, the Inter-dimension correlations, ranging from 0.178 to 0.769, supported the tool's discriminant validity. This indicates that while some relatedness among Self-Concept domains was expected, adolescents in school settings were able to differentiate between the ten domains. In summary, the construct validity of this Self-Concept measure is satisfactorily high.

### Item Validity

To validate the Bengali version of Beena Shah's Self-Concept Inventory (SCI), researchers utilized item-total correlation techniques. They assessed item validity by calculating item-total correlations. The findings, significantly above the 0.01 level of significance, showed strong correlations ranging from 0.250 to 0.693, as depicted in Table 4. Consequently, items with significant correlations with the total score were retained as valid items.

**Table-5: Inter-Dimensions and Dimension-Total Correlation Matrix of Adopted Bengali Versioned Self-Concept Inventory (SCI)**

| Dimensions | SSC | ESC | PSC | CSC | ASC | PoSC | JRSC | SC | SCRBT | SCRPT |
|---|---|---|---|---|---|---|---|---|---|---|
| **Social** | - | | | | | | | | | |
| **Emotional** | 0.49 | - | | | | | | | | |
| **Physical** | 0.44 | 0.56 | - | | | | | | | |
| **Cognitive** | 0.49 | 0.54 | 0.41 | - | | | | | | |
| **Aesthetic** | 0.42 | 0.35 | 0.33 | 0.39 | - | | | | | |
| **Political** | 0.32 | 0.43 | 0.36 | 0.44 | 0.27 | - | | | | |
| **Job-Related** | 0.54 | 0.65 | 0.48 | 0.74 | 0.46 | 0.51 | - | | | |
| **Self-Confidence** | 0.52 | 0.50 | 0.45 | 0.66 | 0.34 | 0.41 | 0.69 | - | | |
| **Beliefs and Traditions** | 0.36 | 0.52 | 0.26 | 0.38 | 0.18 | 0.28 | 0.47 | 0.36 | - | |
| **Personality Traits** | 0.52 | 0.63 | 0.48 | 0.68 | 0.41 | 0.46 | 0.77 | 0.62 | 0.46 | - |
| **Total** | 0.72 | 0.82 | 0.63 | 0.80 | 0.54 | 0.60 | 0.89 | 0.76 | 0.59 | 0.84 |

**B. Reliability**

**Cronbach's Alpha Coefficient**

The reliability of the ten-dimensional tool was evaluated using Cronbach's Alpha (α-Coefficients). The overall reliability coefficient for the entire tool was found to be 0.918, indicating a very high level of internal consistency. Additionally, individual reliability coefficients for each of the ten dimensions were presented in Table 6. These specific coefficients provide insights into the internal consistency of each dimension.

**Table-6: Reliability Statistics of Adopted Self-Concept Inventory (SCI)**

| Sl.No. | Dimension | α-Coefficient | Split-Half Coefficient |
|---|---|---|---|
| 1 | SSC | 0.60 | 0.61 |
| 2 | ESC | 0.69 | 0.68 |
| 3 | PSC | 0.29 | 0.35 |
| 4 | CSC | 0.68 | 0.67 |
| 5 | ASC | 0.37 | 0.37 |
| 6 | PoSC | 0.30 | 0.31 |
| 7 | JRSC | 0.76 | 0.74 |
| 8 | SC | 0.61 | 0.65 |
| 9 | SCRBT | 0.19 | 0.20 |
| 10 | SCRPT | 0.67 | 0.68 |
| | **Total** | **0.92** | **0.92** |

**Split-Half Reliability**

The split-half reliability of the inventory was computed for each dimension and the composite scale of SCI by applying the Spearman-Brown Formula. The coefficients of correlation between the two halves of the various dimensions of self were calculated and shown in Table 6. The value of the overall reliability coefficient was found to be 0.917, which was highly significant (far beyond the 0.001 level of significance), concluding that the test was highly reliable.

During the standardization of the Bengali version of the n-Ach scale, internal consistency was assessed through corrected item-total correlations for all 62 items. The findings revealed that each of the 62 items had a corrected item-total correlation value exceeding 0.25 (refer to Table 4), indicating robust internal consistency within the scale.

## 4. Discussion

Based on the results, it can be inferred that the adapted Bengali version of Beena Shah's Self-Concept Inventory (SCI) was a reliable and valid instrument for measuring self-concept among school-going adolescents living in South 24 Parganas.

The item analysis and t-values of all 62 items strongly indicated that the translation and adaptation process was successful. The robust correlations observed between different dimensions and the total scale score in the Bengali SCI supported its Convergent Validity, indicating its effectiveness in measuring self-concept among Bengali-speaking adolescents. Furthermore, the variations in inter-subscale correlations demonstrated that adolescents in educational settings could accurately distinguish among the ten distinct domains of self-concept. This confirmed the Discriminant Validity of the test, showcasing its ability to measure various nuanced aspects of self-concept beyond a singular, overarching construct.

The adapted Beena Shah's Self-Concept Inventory (SCI) demonstrated high internal consistency reliability, with a Cronbach's alpha coefficient of .918 and a Split-Half reliability coefficient of 0.917. These coefficients indicated a strong level of agreement among the items in the scale, suggesting that they were closely interrelated and measured a unified underlying construct of self-concept among the participants. The high individual coefficients for each dimension further indicated that each dimension was dependable for measuring its specific construct. Overall, these findings affirmed that the tool was a reliable instrument for assessing each of the ten dimensions it covered.

A corrected item-total correlation above 0.25 was generally considered indicative of good internal consistency, demonstrating that each item in the scale was positively correlated with the overall measurement of self-concept. This implied that the items effectively measured the intended construct and contributed cohesively to the reliability and validity of the Bengali version of the SCI for assessing self-concept in the Bengali-speaking population.

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