

Reliability And Validity Of The Adopted Bengali Versioned Deo-Mohan Achievement Motivation (N-Ach) Scale

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Abstract

The study aimed to adopt the Deo-Mohan Achievement Motivation (n-Ach) scale to suit the cultural context of Bengali adolescents, as well as establish its reliability and validity. This study involved 186 participants, aged 14 to 16 years studying in 9th and 10th grades in South 24 Parganas. Item analysis confirmed the validity of all items in the Bengali n-Ach scale. To assess the construct validity of the adapted scale, different analyses such as factors-total correlation (convergent validity) and inter-factors correlation (discriminant validity) were performed. Concurrent validity was established by demonstrating a strong correlation ($r = 0.871$) between the adapted n-Ach scale and the Achievement Motivation Inventory developed by Muthee & Thomas in 2009. To gauge the reliability of the adapted scale, Cronbach's alpha coefficient was used, yielding a high value of 0.941. Additionally, test-retest reliability was assessed, resulting in a coefficient of 0.71. In conclusion, the Bengali version of the Deo-Mohan Achievement Motivation (n-Ach) Scale, after adaptation, has proven to be a reliable and valid tool for measuring achievement motivation among Bengali students.

Keywords: Achievement Motivation, Adolescents, Bengali adaptation, Deo-Mohan Achievement Motivation (n-Ach) Scale, Reliability, Validity

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I. Introduction

Achievement motivation is a psychological drive that pushes individuals to pursue excellence, overcome obstacles and achieve high standards. It involves a desire to accomplish difficult tasks, excel and surpass oneself or others. **Henry Murray (1938)** and **David McClelland (1953)** were significant figures in the study of achievement motivation. According to McClelland's achievement motivation theory, "Achievement motivation is a disposition to strive for success in competition with others with some standard of excellence, set by the individual" (**McClelland, Atkinson, Clark and Lowell, 1953**). McClelland's theory emphasizes several key components of achievement motivation: i) Competition with Standard of Excellence: Individuals set and maintain high standards goal for their performance. ii) Effort and Persistence: People with high achievement motivation work hard, are persistent, and are willing to exert effort to attain excellence. iii) Need for Achievement: This drive fuels an individual's desire to master challenging situations and excel in their pursuits. Atkinson's approach-avoidance theory (**Atkinson, 1957,1964; Nicholls, 1984**) suggests that individuals seek situations that allow them to demonstrate high abilities and avoid situations where they might demonstrate low abilities. Task choice is influenced by the desire to exhibit competence and avoid feelings of shame or inadequacy. Atkinson and Feather's theory of achievement motivation (**Atkinson and Feather, 1966**) incorporates three components: the individual's predisposition towards achievement, the probability of success, and the perceived value of the task. The tendency

to achieve success is influenced by these factors, which are interrelated. $T_s = M_s \times P_s \times I_n$. The tendency to achieve success (T_s) is a multiplicative function of the motive to achieve success (M_s), expectancy or probability of success (P_s), and incentive value of success (I_n) (McClelland, D. C., 1985). Achievement motivation can be influenced by family dynamics and upbringing. Parents, teachers and significant others play a role in shaping an individual's standards of excellence and their motivation to achieve. Students also consider the role of resources, like teachers, in helping them achieve their goals. High achievers often seek praise and approval from significant others. Lastly, attitude toward education refers to a student's predisposition to engage in educational activities. It's influenced by a belief in the usefulness of education and a tendency to either embrace or avoid educational tasks.

Deo-Mohan Achievement Motivation Scale (n-Ach), which was developed by Dr. Pratibha Deo (Pune) and Asha Mohan (Chandigarh) in 1985, is designed to measure various aspects of achievement motivation and consists of 50 items along with fifteen factors or dimensions, mentioned Table 2. These factors are grouped into three main areas such as *academic factors*, *factors of the general field of interest* (competition in co-curricular activities), and *factors of social interest*.

Reliability refers to the consistency and stability of a measurement tool over time and across different samples. In the case of the Deo-Mohan Achievement Motivation Scale, reliability was assessed using the test-retest method. This method involves administering the scale to the same group of participants on multiple occasions and measuring the correlation between their scores. The obtained reliability coefficients are as follows:

Table 1: Results of Reliability Assessment of Deo-Mohan Achievement Motivation Scale

Sample	N	Interval	R	Level of Significance
Mixed Group	51	4 weeks	0.69	0.01
Males	33	5-6 weeks	0.67	0.01
Females	50	5-6 weeks	0.78	0.01

The higher the coefficient, the more reliable the scale is considered. In this case, the coefficients range from 0.67 to 0.78, which are generally considered to be acceptable levels of reliability.

Validity refers to the extent to which a measurement tool accurately measures the construct it is intended to measure. The manual of the Deo-Mohan Achievement Motivation Scale discusses the validity of the scale using several approaches: *i) Item Validity*: The high-low discrimination method was used to establish item validity, indicating that items on the scale effectively discriminate between individuals with different levels of achievement motivation. *ii) Projective Test Validation*: The scale was used to validate a projective test of achievement motivation. The correlation coefficient between the scale and the projective test was observed to be 0.54. This indicates a concurrent validity, suggesting that the scale's scores are related to scores obtained from the projective test. Regarding the r of .54 between the scale and the projective test, McClelland (1958) explains that self-descriptive and projective measures are usually not correlating high with each other. *iii) Correlation with Other Scales*: The scale scores were correlated with scores from the *Aberdeen Academic Motivation Inventory of Entwistle (1968)*, yielding a correlation coefficient of 0.75 for a mixed sample of 93 participants. This high correlation supports the validity of the scale, indicating its ability to measure achievement motivation effectively.

In the present study, the researchers used the Deo-Mohan achievement motivation scale to ascertain the status of reliability and validity of achievement motivation among Bengali-speaking school-going adolescents.

Rationale of the study

The overall goal of the study is to ensure that the Bengali version of the Deo-Mohan Achievement Motivation test is culturally appropriate, linguistically accurate, and psychometrically sound for assessing achievement motivation among Bengali-speaking participants. It is important to note that such an adaptation and translation process is crucial for maintaining the integrity of psychological assessment tools when used in different linguistic and cultural contexts. It helps to ensure that the results obtained from the translated version are comparable to those from the original version and that they accurately reflect the construct being measured.

Objectives of the study

1. To test the different types of validity of the Bengali versioned Deo-Mohan Achievement motivation scale with the help of cross-validation technique (construct validity) and concurrent method (concurrent validity) for school-going adolescents of South 24 Parganas.
2. To test the reliability of the Bengali versioned Deo-Mohan Achievement motivation scale with the help of the test-retest method (external consistency) and Cronbach's alpha determining method (internal consistency) for school-going adolescents of South 24 Parganas.

II. Review of Literature

In 1968, Entwistle conducted research using a 24-item ‘Aberdeen Academic Motivation Inventory’ and found a test-retest reliability coefficient of 0.83, with a 2.5-month interval. Lynn, in 1969, discovered that his ‘Achievement Motivation Questionnaire’ had a correlation of 0.34 with Cattell’s 16PF factor, 0.16 with superage, and 0.21 with surgency. Bending, in 1964, determined reliability coefficients of 0.68 for men and 0.62 for women for his ‘Factor-Analytic Scale of Need Achievement’. Costello, in 1967, obtained a split-half reliability coefficient of 0.82 for one scale and 0.73 for another scale for his ‘Two Scales to Measure Achievement Motivation’. Finally, Smith, in 1973, computed a split-half reliability coefficient of 0.56 for his 10-item ‘A Quick Measure of Achievement Motivation’.

The study conducted by **Mahjabin and Sultana (2020)** titled “Adaptation of the Deo-Mohan Achievement Motivation (n-Ach) Scale for Urban Students in Bangladesh.” This study aimed to adapt the Deo-Mohan Achievement Motivation (n-Ach) scale to the Bangladeshi cultural context and assess its validity and reliability among adolescents in Dhaka city. The study included 228 adolescents aged 13 to 19 years as participants. The internal consistency reliability of the adapted scale was assessed using Cronbach’s alpha coefficient, which was found to be 0.902. Test-retest reliability was also measured, and the coefficient was 0.907. Concurrent validity was assessed by measuring the correlation ($r = .311$) between the adapted n-Ach scale and the Rosenberg Self-Esteem Scale. Exploratory factor analysis (EFA) was conducted to assess the construct validity of the adapted scale. The EFA results revealed that the 10 factors of the Bangla n-Ach scale collectively accounted for 58.33% of the total variance.

III. Methodology

Participants

The study involved 186 Bengali-speaking adolescents, aged 14-16 years who were randomly selected from two Government Sponsored Higher Secondary Schools (Durgapur K.C. High School and Kulari Chhayani Janapriya Vidyamandir) in South 24 Parganas, West Bengal. Those adolescents were selected from 9th grade (n=86) and 10th grade (n=100), with a majority being males (n=166) and a smaller number being females (n=20).

Measures

The study had a two-phase approach. In the first phase, both the Deo-Mohan Achievement Motivation (n-Ach) Scale (Deo & Mohan, 1985) and the Achievement Motivation Inventory (Muthee & Thomas, 2009) were administered to the participants to assess concurrent validity. Subsequently, in the second phase, the Deo-Mohan Achievement Motivation (n-Ach) Scale was re-administered after an 8-week interval to assess the test-retest reliability of the scale.

Tools used

1. Deo-Mohan Achievement Motivation (n-Ach) Scale (Deo & Mohan, 1985)

It is a 5-point Likert scale with 50 items (37 positives and 13 negatives) and it contains 15 subscales. The response options typically range from “always” to “never”. A positive item has weights of 4,3,2,1 and 0 for the categories of always, frequently, sometimes, seldom, and never. The negative elements were scored in the opposite order, i.e., 0, 1, 2, 3, and 4 for the same categories.

Table 2: Deo-Mohan Achievement Motivation (n-Ach) Scale

S.No.	Dimension	No. of Items
1	Academic motivation	4
2	Need for achievement	4
3	Academic challenge	4
4	Achievement anxiety	1
5	Importance grades/marks	2
6	Meaningfulness of task	4
7	Relevance of school to future goals	2
8	Attitude towards education	4
9	Work methods	5
10	Attitude towards teachers	3
11	Interpersonal relations	4
12	Individual concern	2
13	General Interest	4
14	Dramatics	2
15	Sports	5
	Total	50

Adaptation Process of Translated Bengali Versions of the Deo-Mohan Achievement Motivation (n-Ach) Scale

A group of experts, including researchers, psychologists, and linguists, was involved in translating the original English version of the Deo-Mohan Achievement Motivation (n-Ach) test into Bengali. The aim was to adapt the vocabulary and grammar to the age and socio-cultural characteristics of the Bengali-speaking population. The translation process focused on capturing the notional content and achieving linguistic and psychological equivalence with the original, rather than a strict literal translation.

The translation-retranslation method was used, involving two rounds of translation and a re-translation back to English.

A third group of experts reviewed both the original English form and the re-translated English form to identify any differences and suggest adjustments to the Bengali version.

2. Achievement Motivation Inventory (Muthee & Thomas, 2009):

It is a five-point Likert-type scale with 32 items where positive and negative items are 18 and 14 respectively. It includes several dimensions: motivation for achievement (evidenced by competitiveness and goal orientation), inner resources (evidenced by relaxed style, happiness, patience and self-confidence), interpersonal strengths (evidenced by assertiveness, personal diplomacy, extraversion and cooperativeness), and work habits (evidenced by planning and organization, initiatives and team spirit). The internal consistency reliability of this scale is 0.749 and its validity is supported by its similarity to well-established inventories.

IV. Results

Item Analysis

The item analysis aimed to achieve two goals: firstly, to identify items that would contribute to a consistent scale, and secondly, to remove items that did not meet this criterion. To accomplish this, data from 186 participants were analyzed using the Likert Method (Edwards, 1957), following a process where the response sheets were ordered by total scores. Subsequently, the top 27% and bottom 27% of participants, representing the high and low groups respectively (with 50 individuals in each group), were selected. The capacity of each item to differentiate between these two groups was assessed through t-tests. Items that yielded statistically significant t-values (with a significance threshold of p-value < 0.05 or t-value > 1.96) were considered effective in distinguishing between the two groups. After doing the item analysis of the Bengali version of the test all of the items were found valid and presented in Table 3 below. The distribution of the total 50 items in the fifteen dimensions was as per the original English version of the test.

Table 3. The t-values relating to items in the Bengali version of the Deo-Mohan Achievement Motivation (n-Ach) Scale (DMAMS)

Serial No. (Dimensions)	t-value	Corrected Item-total Correlation
1. Academic motivation	5.381	0.520
2. Academic motivation	9.535	0.656
3. Academic motivation	6.473	0.512
4. Academic motivation	9.449	0.710
5. Need for achievement	8.517	0.623
6. Need for achievement	10.883	0.673
7. Need for achievement	10.385	0.704
8. Need for achievement	7.846	0.532
9. Academic Challenge	8.180	0.647
10. Academic Challenge	9.785	0.709
11. Academic Challenge	7.625	0.645
12. Academic Challenge	7.135	0.584
13. Achievement anxiety	2.556	0.262
14. Importance grades/marks	5.471	0.507
15. Importance grades/marks	9.011	0.680
16. Meaningfulness of task	10.677	0.711
17. Meaningfulness of task	2.843	0.342
18. Meaningfulness of task	8.112	0.582
19. Meaningfulness of task	7.563	0.477
20. Relevance of school to future goals	6.480	0.482
21. Relevance of school to future goals	5.118	0.347
22. Attitude towards education	7.289	0.578
23. Attitude towards education	9.144	0.702
24. Attitude towards education	9.158	0.716
25. Attitude towards education	8.213	0.652
26. Work methods	9.320	0.695

27. Work methods	9.657	0.715
28. Work methods	10.312	0.739
29. Work methods	11.132	0.741
30. Work methods	10.429	0.723
31. Attitude towards teachers	4.667	0.354
32. Attitude towards teachers	5.876	0.403
33. Attitude towards teachers	11.025	0.740
34. Interpersonal relations	7.551	0.441
35. Interpersonal relations	8.028	0.613
36. Interpersonal relations	8.026	0.654
37. Interpersonal relations	5.075	0.387
38. Individual concern	11.994	0.742
39. Individual concern	9.667	0.747
40. General interest	4.101	0.394
41. General interest	7.470	0.618
42. General interest	1.961	0.273
43. General interest	3.685	0.260
44. Dramatics	2.972	0.296
45. Dramatics	3.781	0.347
46. Sports	2.223	0.297
47. Sports	2.711	0.254
48. Sports	2.709	0.297
49. Sports	3.522	0.279
50. Sports	5.071	0.439

A. Validity

Construct Validity-

The Bengali version of the Deo-Mohan Achievement Motivation (n-Ach) Scale's validity was established through cross-validation techniques. To assess its convergent construct validity, researchers calculated correlations between various dimensions of the DMAMS and the total scale score. The results, which were well above the 0.01 level of significance, indicated strong correlations (ranging from 0.327 to 0.909), as displayed in Table 4. Furthermore, the Interfactor correlations, which varied from 0.075 to 0.845, supported the discriminant validity of the tool. This suggests that, despite the logical expectation of some degree of relatedness among Achievement Motivation domains, adolescents in school settings were able to distinguish between the fifteen domains. In summary, the construct validity of this Achievement Motivation measure is notably high.

Table 4: Inter-factors Correlation Matrix Result for the Bengali version of the Deo-Mohan Achievement Motivation (n-Ach) Scale

Correlations			
		Deo-Mohan	Muthee
Deo-Mohan AMS	Pearson Correlation	1	.871**
	Sig. (2-tailed)		.000
	N	186	186
Muthee AMI	Pearson Correlation	.871**	1
	Sig. (2-tailed)	.000	
	N	186	186
**. Correlation is significant at the 0.01 level (2-tailed).			

Concurrent Validity-

In terms of concurrent validity, the scores from the Deo-Mohan Achievement Motivation (n-Ach) scale were examined in relation to scores obtained through the administration of the Achievement Motivation Inventory (Muthee & Thomas, 2009) among a sample of 186 individuals. The analysis revealed a strong correlation coefficient of 0.871, as indicated in Table 5. This suggests a high degree of concurrent validity between the two measures, indicating that they are measuring a similar construct or trait.

Table 5: Correlation Matrix of Deo-Mohan AMS and Muthee AMI

Dimensions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Academic	-														
Need	.701	-													
Challenge	.693	.783	-												
Anxiety	.079	.193	.228	-											
Grade	.533	.631	.669	.081	-										
Task	.600	.614	.726	.238	.555	-									
Goal	.576	.495	.465	.201	.363	.543	-								
Education	.657	.779	.750	.114	.685	.661	.551	-							
Work	.755	.803	.845	.123	.658	.703	.559	.808	-						
Teachers	.480	.569	.514	.156	.447	.517	.407	.606	.544	-					
Relations	.619	.674	.675	.198	.596	.605	.451	.697	.722	.530	-				
Individual	.662	.705	.716	.106	.626	.592	.376	.746	.774	.529	.632	-			
Interest	.498	.437	.347	.087	.286	.361	.369	.461	.457	.369	.355	.479	-		
Dramatics	.221	.252	.218	.079	.117	.206	.093	.191	.219	.171	.179	.254	.111	-	
Sports	.084	.197	.206	.075	.183	.092	.011	.147	.157	.119	.128	.210	.229	.324	-
Total	.808	.871	.874	.395	.720	.777	.608	.870	.909	.666	.790	.825	.575	.346	.327

B. Reliability

Test-retest Reliability

The test-retest method mainly assesses the External Consistency of a test. The test-retest reliability was evaluated using the Pearson product-moment correlation coefficient (r). The reported correlation coefficient was 0.71, indicating a strong positive correlation between the scores obtained in the two administrations of the scale over the 8-week period.

Cronbach’s Alpha Coefficient

The reliability of the tool consisting of fifteen dimensions was assessed using Cronbach’s Alpha (α -Coefficients). The overall reliability coefficient for the entire tool was reported as 0.941, which is a very high level of internal consistency. Furthermore, individual reliability coefficients for each of the fifteen dimensions were reported in Table 6. These individual coefficients help evaluate the internal consistency of each specific dimension.

Table 6: Reliability Statistics of Adopted Scale

Sl.No.	Dimension	α -Coefficient
1	Academic motivation	.734
2	Need for achievement	.702
3	Academic challenge	.763
4	Achievement anxiety	.345
5	Importance grades/marks	.504
6	Meaningfulness of task	.638
7	Relevance of school to future goals	.552
8	Attitude towards education	.761
9	Work methods	.865
10	Attitude towards teachers	.515
11	Interpersonal relations	.555
12	Individual concern	.738
13	General Interest	.470
14	Dramatics	.444
15	Sports etc	.599
	Total	.941

In the assessment of the Bangla version of the n-Ach scale, internal consistency was also evaluated using corrected item-total correlations for all 50 items. The results indicated that each of the 50 items had a corrected item-total correlation value above 0.25 (see Table 3) showing strong internal consistency within the scale.

V. Discussion

Based on the results, it can be inferred that the adapted Bengali version of the Deo-Mohan Achievement Motivation (n-Ach) Scale is a reliable and valid instrument for measuring achievement motivation among school-going adolescents living in South 24 Parganas.

As per item-analysis and t-value of 50 items clearly indicate that the translation and adaptation process was successful.

The strong correlations between different dimensions and the total scale score in the Bengali DMAMS affirm its Convergent Validity, indicating that it effectively measures achievement motivation among Bengali-speaking adolescents. The diversity in inter-factor correlations illustrates that adolescents in educational settings can effectively differentiate among the fifteen distinct domains of achievement motivation. It confirms the Discriminant Validity of the test, highlighting its ability to measure more than just a single, overarching construct and its capacity to capture the nuanced aspects of motivation.

The strong positive correlation of 0.871 observed between the Deo-Mohan Achievement Motivation scale, which includes certain items related to school, and the Achievement Motivation Inventory by Muthee & Thomas (2009), which incorporates specific items related to home, indicates a significant association between these two measurement tools. This finding strengthens the evidence for the validity of the n-Ach scale and its relevance in assessing achievement motivation among adolescents. Moreover, the alignment of this correlation with findings from a prior study by Mahjabin and Sultana in 2020 serves as additional confirmation of the concurrent validity of the Deo-Mohan Achievement Motivation (n-Ach) scale when compared to the Rosenberg Self-Esteem Scale.

The test-retest reliability coefficient value of 0.71 is slightly lower and might indicate a moderate level of stability over time for the scale scores. However, it still suggests a reasonable level of stability, especially considering that psychological constructs like achievement motivation can be influenced by various factors that might introduce variability over time.

The internal consistency reliability of the adapted Deo-Mohan Achievement Motivation (n-Ach) scale, as indicated by a Cronbach's alpha coefficient of .941, suggests a high level of consistency or agreement among the items in the scale. That is the items within the scale are strongly interrelated and measure a common underlying construct of achievement motivation among the participants. High individual coefficients for each dimension indicate that each dimension is reliable for measuring its specific construct. Overall, the findings suggest that the tool is a reliable instrument for assessing each of the fifteen dimensions it encompasses. The fact that this finding is supported by Mahjabin and Sultana (2020), strengthens the reliability aspect of the adapted n-Ach scale.

A corrected item-total correlation above 0.25 is generally considered indicative of good internal consistency, demonstrating that each item in the scale is positively correlated with the overall measurement of achievement motivation. This implies that the items effectively measure the intended construct and contribute cohesively to the reliability and validity of the Bengali version of the n-Ach scale for assessing achievement motivation in the Bengali-speaking population.

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