# Construction and Standardization of Examination Anxiety Scale for Adolescent Students 

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#### Abstract

This research paper describes the method of construction and standardization of a tool to measure examination anxiety of adolescent students. 2030 students belonging to the age group of 13-15 years from 19 schools under West Bengal Board of Secondary Education, participated in this research. The first draft of examination anxiety scale consisted 40 items. After reviewing the items and item analysis, the number of items were reduced to 38 . EFA was carried out on obtained data. EFA revealed that total 21 items having factor loading greater than .40, are selected. They distributed under four factors such as, Bodily symptoms, Cognitive, Emotional reaction and behavioural reaction. CFA was executed on another sample group, consisted of 402 number of adolescent students of age group13-15. CFA results also supported the results of EFA. All the goodness of fit indices showed that the model is a good fit model. For concurrent validity, Examination Anxiety Scale made by researcher and Test Anxiety Inventory by Spielberger were administered on the same occasion on 110 school students of the age group13-15. Coefficient of correlation of two scales was estimated. The validity of Examination anxiety Scale is 0.71 . The reliability coefficient of the examination anxiety scale using test-retest, split half and Cronbach's alpha methods were $0.801,0.767,0.764$ respectively. Norms show that 16 percent of the students belong to the high examination anxiety group, 66 percent of the students in average examination anxiety group and 18 percent in low examination anxiety group.


## 1. INTRODUCTION

Zeidner (1992) corroborates, "contemporary society is best described as test-oriented and test consuming". In this context, famous psychologist Sarason (1959) implies, "We live in a test conscious, test-giving culture in which the lives of people are in part determined by their test performance". In present scenario test or examination is most prominent cause of anxiety among students. Generally, students feel the utmost fear of examination by anticipating their poor performances and failure, this causes examination anxiety. In fact, examination anxiety is an unpredictable worry about the consequence regarding performance, fear of being assessed, and the apprehension about the results. It also includes irrational thoughts, unnecessary demands and expectation, and catastrophic predictions. Examination anxiety is supposed to be "a major factor contributing to a variety of negative outcomes, including psychological distress,

[^0]academic underachievement, academic failure, and insecurity" (Hembree, 1988). A student with an optimum level of anxiety performs well in the examination but excessive level of examination anxiety deteriorates the performances in examination (Abbasi \& Ghosh, 2020). According to Zeidner (1998) "many students have the ability to do well on exams, but perform poorly because of their debilitating levels of anxiety. Consequently, test anxiety may limit educational or vocational development, as test scores and grades influence entrance to many educational or vocational training programs in modern society". Wine (1971) implied that both self-relevant and task-relevant variables are attended by those people who have high test anxiety at the time of examination; on the other hand, those people who have low test-anxiety generally attend to task-relevant variables. In fact, those people have high test anxiety envisage in the time of examination.
Examination anxiety causes a couple of problems. However, each student has different symptoms, having different levels of intensity. Shukla (2013) categorized these symptoms under four dimensions.
i) Physical - nausea or diarrhea, extreme body temperature changes, dry mouth, headache, sweating, rapid heartbeat, shortness of breath, light-headedness,
ii) Emotional -feeling of helplessness, anger, excessive feelings of fear, uncontrollable crying, disappointment, depression,
iii) Behavioural - substance abuse, fidgeting, avoidance, pacing,
iv) Cognitive - negative thinking, the difficulty of organizing thought, negative self-talk, racing thoughts, comparing yourself to others, "going blank", difficulty concentrating, and feelings of dread.
According to McDonald (2010), 10-40 percent of all students are severely affected by examination anxiety. The percentage also increases in the case of the formal examination. The examination anxiety is a very serious problem of modern times; its consequences are found in several forms like trauma, psychological disorder, and suicide, as reported in the newspaper during the period of examination.
According to National Crime Bureau (NCB, 2015), there is a shocking report in the context of India that 2646 students, more than 7 per day in each year, are found to commit suicide due to failure in examinations. In 2014 the number was marginally lower- 2403 (NCB, 2014).
In present times, test anxiety measures are constructed to reveal a "bio-psychosocial model" of test anxiety, which hypothesizes the notion that test anxiety is revealed through 'behavioural, cognitive and physiological symptoms' (Lowe et al., 2008 \& Embse et al., 2013).
Whereas Sarason et al. (1960), being earlier examination anxiety researchers interpreted the concept of test anxiety on the basis of one dimension, but later, Libert and Moris (1967) divided test anxiety into two components- one is "worry," and another is "emotionality". However, in the 1980s, more significantly the detailed definition of the dimension "worry" was proposed, such as "irrelevant thinking" and "worry" (Sarason, 1984), "worry" and "fear of failure" (Covington, 1985), and "distraction" and "low self-confidence" (Hodapp \& Benson, 1997). Thus, it can be inferred from the past studies that the concept of examination anxiety has evolved into a multi-layered notion with several dimensions of responses, as reported by Zeidner (1998), that includes behavioral, physiological, and emotional and thinking components. Based on these deductions, this study focuses on the four major components of the examination anxiety scale. These are worry, emotional reaction, bodily symptoms, and behavioral reaction.
The first measurement instrument for examination anxiety was devised by Mandler and Sarason in 1952. This test anxiety questionnaire having 42 items aims at measuring the experience before and during intelligence test and course examination. Six years later, another Test Anxiety

Scale consisting of 21 items, was developed by Sarason (1958). Finally, in 1972 Sarason developed test anxiety scale with 37 items. Suinn (1969) developed Test Anxiety Behaviour Scale, another global measurement scale having 50 items, efficiently assesses the behavioral condition at the time of examination anxiety. Test Anxiety Inventory (TAI) was developed by Spielberger and its Associates (1980). The TAI, a standardized measurement scale for test anxiety, consists of 20 items that separate worry and emotionality and, at the same time, yields total score of examination anxiety. Actually, many more examination anxiety measures are found in the global perspective, but examination anxiety measures on the basis of Indian perspectives are rarely found. So this research aims at developing a scale that measures the examination anxiety of adolescents.
The main purpose of the study is to construct a standardized examination anxiety scale for adolescent students. The study also aims at computing reliability and validity of the scale.

## 2. METHOD

### 2.1. Population

The population of the study includes the adolescent students of the age group of 13-15 years, studying in schools under the West Bengal Board of Secondary Education.

### 2.2. Sample

2030 students of whom age group ranges 13-15 years of 19 schools of West Bengal Board of Secondary Education of West Bengal were selected as sample for the first participant group. The sample of the study was selected from Jalpaiguri, Coochbihar, Darjeeling, S. Dinajpur, South 24 Parganas, Burdwan, and Kolkata district of West Bengal. Boys and girls of class IX and X , from rural and urban areas of West Bengal, were selected.
For Confirmatory factorial analysis, like Akkus (2019) also did, a different sample was taken. In this present study the researchers also selected 402 numbers of students of whom age group ranges 13-15 years from 7 schools of West Bengal Board of Secondary Education as sample for Confirmatory factorial analysis.

### 2.3. Construction of Scale

The first step of the construction of the Examination Anxiety Scale (EAS) is to construct the items. The researchers constructed both positive and negative items reflecting examination anxiety of the students.
The researcher studied related literature on examination anxiety in order to collect and construct items. Teachers and students provided much information about the examination anxiety of the students. With the help of this information the researchers constructed items reflecting the examination anxiety of the students.
The researchers constructed the first draft of the Examination Anxiety Scale. The first draft of the Examination Anxiety Scale (EAS) consisted of 40 items. 28 items were positive items and 12 of the items were negative items.
The primary Examination Anxiety scale (EAS) is divided into four subscales or sub-points;

1. Bodily Symptoms Subscale
2. Cognitive (Worry Subscale)
3. Emotional Reaction Subscale
4. Behavioural Reaction Subscale

### 2.4. Evaluation by Experts and Reconstruction of the Tool

The items were prepared by the researchers and evaluated by the experts of the subject and language. The researchers followed their suggestions and made necessary modifications in the

Examination Anxiety Scale. This modified Examination Anxiety Scale (EAS) consisted of 40 items.

### 2.5. Scoring Key

The scale consists of a 5-point Likert scale. The five options given are strongly agree, agree, undecided, disagree, and strongly disagree. Table 1 and Table 2 show the scoring code of positive items and negative items respectively.

Table 1. Scoring for positive items

| Types of rating | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Score | 5 | 4 | 3 | 2 | 2 |

Table 2. Scoring for negative items

| Types of rating | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Scores | 1 | 2 | 3 | 4 | 5 |

As each response weighted from 1 to 5, the minimum Examination Anxiety Scale (EAS) total score is 40 , and the maximum total score is 200 . The Examination Anxiety Scale (EAS) has four subscales which measure the four major components of examination anxiety. The subscales are Bodily Symptoms (EAS/Bo) Worry (EAS/W), Emotionality (EAS/E) and Behavioural Reaction (EAS/B). Worry refers to the cognitive side of anxiety (Sarason, 1984).
The items in EAS/Bo subscale are: 4, 6, 11, 15, 16, 18, 27, 32, 33, 35
The items in EAS/W subscale are: 1, 5, 12, 13, 14, 17, 22, 23, 24, 28, 37, 38, 39, 40
The items in EAS/E subscale are: 2, 3, 7, 8, 9, 19, 21, 29, 30, 34, 36
The items in EAS/ Be subscale are: 10, 20, 25, 26, 31.

### 2.6. Administration of the Scale

The draft Examination anxiety scale (EAS) consisting of 40 items was administered on a group of 2030 students belonging to the age group 13-15 years for item analysis and exploratory factor analysis. The sample was drawn from the 19 schools under West Bengal Board of Secondary Education. The schools included students from both rural and urban areas of the state. The researchers explained the purpose of the administration of the examination anxiety scale to the students. A clear instruction was given by the researchers regarding how to respond the items of the test. Then, the final draft of EAS was administered on the second participant group, which comprised of 402 number of school students for Confirmatory factor analysis.

## 3. RESULTS

### 3.1. Item Analysis

On the basis of the total score of each respondent, the researcher selected upper $27 \%$ cases of the whole group as a high score group and lower $27 \%$ cases of the whole group as a low score group. After that $t$ - test value was calculated between two groups. $t$ values of each item are shown in Table 3. The items which have $t$ value of less than 1.96 have been rejected. According to Table 3, all the items except, $30 \& 39$ are significant. The researcher decided to select all the significant items which are significant and higher than $1.96 t$ value for the second draft of the scale.

Table 3. $t$ value of the items of Examination Anxiety Scale (Item discrimination index)

| Item no | $t$ value | Item No. | $t$ value | Item no. | Value |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 23.067 | 2 | 20.151 | 3 | -22.377 |
| 4 | 24.005 | 5 | -10.302 | 6 | 14.069 |
| 7 | 22.157 | 8 | 26.972 | 9 | 29.992 |
| 10 | 18.091 | 11 | 29.382 | 12 | -22.788 |
| 13 | 22.482 | 14 | -24.753 | 15 | 19.585 |
| 16 | 21.586 | 17 | 16.125 | 18 | -24.036 |
| 19 | -6.917 | 20 | 18.293 | 21 | 19.702 |
| 22 | 15.097 | 23 | 16.511 | 24 | -10.141 |
| 25 | 17.711 | 26 | 20.451 | 27 | 20.403 |
| 28 | 17.829 | 29 | -17.746 | 30 | $\mathbf{- 1 . 2 7 6}$ |
| 31 | 19.116 | 32 | 16.843 | 33 | 25.896 |
| 34 | -6.407 | 35 | 18.297 | 36 | 17.018 |
| 37 | 22.507 | 38 | 19.480 | 39 | $\mathbf{- 1 . 7 4 2}$ |
| 40 | -5.153 |  |  |  |  |

### 3.2. Validity

Freeman (1960) interpreted validity as; "An index of validity shows the degree to which a test measures what it purposes to measure when compared with accepted criteria.".The validity of the Examination Anxiety Scale was determined by the following method.

### 3.2.1. Construct Validity

### 3.2.1.1. Exploratory factor analysis

The principal component analysis was carried out on the data for factor analysis. Varimax orthogonal technique was used for rotation. After analysis, 17 items are eliminated as they were distributed under multiple factors, and their factor loading less was than 0.4 . Only 21 items were selected for the final draft. The 21 items were distributed under 4 factors.


Figure 1. Scree plot showing four factors.
According to Figure 1, there was a sharp drop in the first four factors. They had a noteworthy contribution to variance explanation. According to Nancy et al. (2005), Kaiser-Meyer-Olkin (KMO) measures should be higher than 0.70 . In our study, the KMO value was 0.851 , which is greater than 0.70 . It indicates that enough items are predicted by each factor. Bartlett's test of
sphericity was computed as 8108.15 , and p-value is 0.00 , which is less than 0.05 at the $95 \%$ significant level. It indicates that the research sample was significantly suitable for the analysis of the study. The Scree plot was shown in Figure 1.

Table 4. Factor loading after varimax rotation and extracted communalities and eigenvalues

| Items | Communality | Factor 1 <br> (Bodily Symptoms) | Factor 2 (Cognitive) | Factor 3 (Emotional) | Factor 4 (Behavioral) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 32 | 0.600 | 0.762 |  |  |  |
| 4 | 0.441 | 0.649 |  |  |  |
| 6 | 0.413 | 0.638 |  |  |  |
| 16 | 0.377 | 0.583 |  |  |  |
| 18 | 0.373 | 0.569 |  |  |  |
| 11 | 0.422 | 0.562 |  |  |  |
| 12 | 0.391 |  | 0.661 |  |  |
| 14 | 0.436 |  | -0.624 |  |  |
| 24 | 0.463 |  | -0.620 |  |  |
| 13 | 0.482 |  | 0.613 |  |  |
| 37 | 0.366 |  | 0.496 |  |  |
| 8 | 0.470 |  |  | 0.652 |  |
| 9 | 0.416 |  |  | -0.635 |  |
| 29 | 0.427 |  |  | -0.596 |  |
| 19 | 0.511 |  |  | -0.525 |  |
| 36 | 0.403 |  |  | 0.434 |  |
| 20 | 0.588 |  |  |  | . 667 |
| 25 | 0.489 |  |  |  | . 597 |
| 10 | 0.461 |  |  |  | . 576 |
| 31 | 0.435 |  |  |  | . 458 |
| 26 | 0.389 |  |  |  | 0.410 |
| Eigenvalue |  | 4.615 | 2.064 | 1.422 | 1.259 |
| Explained Variance |  | 13.289 | 12.589 | 9.443 | 9.257 |
| Total variance |  |  | 44.570 |  |  |

Table 4 presents the results of factor analysis. Factor analysis reported four strong factors with an eigen value greater than 1.00. The four factors were i) Bodily symptoms, ii) Cognitive (worry subscale), iii) Emotional reaction, and iv) Behavioural reaction
All item loading exceeded .40. 21 items were selected in final form of the scale out of which, six items are reversed items. All four factors together explain $44.165 \%$ of total variance. The $1^{\text {st }} 2^{\text {nd }}, 3^{\text {rd }}$ and $4^{\text {th }}$ factors explain $13.289,12.589,9.443$, and $9.257 \%$ of total variances, respectively. When four factors were extracted, the highest communality is 0.607 for item 32 , and the lowest communality is 0.365 for item 37 .

### 3.2.1.2. Confirmatory factor analysis

Confirmatory factor analysis was done in order to determine the construct validity of EAS to verify that the items fit with four-factor model. For confirmatory factor analysis, data were collected from a separate sample. The sample comprised of 402 student studying class IX and X of West Bengal.
Confirmatory factor analysis was run through Amos 24.0 software. According to Browne \& Cudeck (1932) a model is considered as a good fit if the $\chi^{2} / d f \leq 2$ (as cited in Akkus, 2019). Confirmatory factor analysis results showed that $\chi^{2} / d f$ ratio is 1.823 . It indicates that the exact fit hypothesis was accepted. The root means square error of approximation (RMSEA)
value is 0.045 . Goodness of fit index (GFI) value is 0.927 , Adjusted goodness of fit index (AGFI) value is 0.908 , Normal fit index (NFI) value is 0.709 , and Comparative fit index (CFI) value is 0.890 . All fit indices show that the model is a good fit model.
If RMSEA value is $\leq 0.05$, then it means that the model is a good fit. And the RMSEA value $\leq$ 0.08 indicates the model fits well with reasonable error (MacCallum, Browne, \& Sagawara, 1996). Most well fit model possesses GFI, AGFI, CFI value $\geq 0.9$ for a strong model (Finch, Immekus, \& French, 2016). Finally, it can be concluded that the EAS model is a good fit model. Confirmatory factorial analysis with standardized result is shown in Figure 2.


Figure 2. Confirmatory Factor Analysis with Standardized Results.

### 4.2.2. Concurrent validity

In the present study for concurrent validity, the Examination Anxiety Scale (EAS) made by the researcher and Test Anxiety Inventory (TAI) by Spielberger (1980) were administered on the same occasion on 110 school students of class 9 and 10 of Harirampur Betna High School of South Dinajpur district. Data were collected, and the coefficient of correlation of two scales was estimated. According to Table 5, the concurrent validity of Examination Anxiety Scale is 0.71 . So the validity of the scale is good. Hence, the scale is valid.

Table 5. Correlation coefficient between Examination Anxiety Scale (EAS) and TAI by Spielberger

|  | Examination Anxiety Scale | Spielberger TAI |
| :--- | :---: | :---: |
| Examination Anxiety Scale <br> Correlation | 1 | 0.71 |
| Spielberger TAI <br> Correlation | 0.71 | 1 |

### 4.3. Reliability

Anastasi and Ubrina (2005) have opined in context to reliability that "Reliability refers to the consistency of scores obtained by the same persons when they are re-examined with the same test on different occasions, or with different sets of equivalent items, or under other variable examining conditions."
The researcher first administered the Examination Anxiety Scale (EAS) to secondary school students. After one month, the researcher administered the Examination Anxiety Scale to the same students.

### 4.3.1. Correlation by test-retest

It is clear from Table 6 that the correlation between test scores and retest scores is 0.801 . It can be said that the reliability of the Scale is high. Hence, the Examination Anxiety Scale is reliable.
Table 6. Correlation co-efficient by the test-retest method

| Test | Pearson correlation | Test | Retest |
| :--- | :--- | :---: | :---: |
|  | N | 1 | 0.801 |
|  | Pearson correlation | 2030 | 2030 |
|  | N | 0.801 | 1 |
|  |  | 2030 | 2030 |

Correlation is significant at the 0.01 level (2-tailed).

### 4.3.2. Cronbach's alpha and split - half coefficient

From Table 7, the reliability of the Examination Anxiety Scale (EAS) by split-half method is 0.767 , and the reliability of the scale by Cronbach's Alfa method is 0.764 . Hence, we can say the reliability of the examination anxiety is high.

Table 7. Correlation coefficient by Cronbach's Alpha and Split-Half method

| Method | Reliability value |
| :--- | :--- |
| Split half | 0.767 |
| Cronbach's Alfa | 0.764 |

### 4.4. Details of the Final Draft

Table 8 shows that 19 items are rejected, and 21 items are retained for the final draft of examination anxiety scale. Table 9 shows that 15 items out of 21 items were positive, and 06 items were negative. According to Table 9, the total number of positive item is 15 and total number of negative item is 6 .

Table 8. Distribution of selected or rejected items for the final draft of the examination anxiety scale

| S. No | Item number | $f$ | Remarks |
| :--- | :--- | :--- | :--- |
| 1 | $4,6,8,9,10,11,12,13,14,16,17,18,19,20,24,25,26,29,32,36,37$ | 21 | Selected |
| 2 | $1,2,3,5,7,15,21,22,23,27,28,30,31,33,34,35,38,39,40$ | 19 | Rejected |

Table 9. Distribution of positive and negative items for the final draft

| Statement | Item number | Total |
| :--- | :--- | :--- |
| Positive | $4,6,8,9,10,11,13,16,17,18,20$, | 15 |
|  | $26,32,36,37$ |  |
| Negative | $12,14,19,24,25,29$ | 6 |
| Total |  | 21 |

Table 10 shows that 6 items were selected for bodily symptoms subscale, 5 items were selected for the cognitive subscale; 5 items were selected for Emotional reaction subscale. 5 items were chosen for the Behavioural reaction subscale.

Table 10. Distribution of three subscales of examination anxiety scale

| Sl no | Subscale | Item no | Total items |
| :--- | :--- | :--- | :--- |
| 1 | Bodily Symptoms (EAS/Bo) | $4,6,11,6,18,32$ | 6 |
| 2 | Cognitive (Worry Subscale EAS/W) | $12,13,14,24,37$ | 5 |
| 3 | Emotional reaction (EAS/E) | $8,9,19,29,36$ | 5 |
| 4 | Behavioural reaction (EAS/Be) | $10,20,25,26,31$ | 5 |
|  | Total |  | 21 |

### 4.4. Standardization of Examination Anxiety Scale

For the calculation of norms, Z scores were calculated for each raw-score.
Table 11. Z score for each raw score

| Serial <br> no | Raw <br> score | Z score | Serial <br> no | Raw <br> score | Z score | Serial <br> no | Raw <br> score | Z score |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1. | 33 | -2.447 | 2. | 34 | -2.364 | 3. | 35 | -2.197 |
| 4. | 36 | -2.197 | 5. | 37 | -2.113 | 6. | 38 | -2.030 |
| 7. | 39 | -1.946 | 8. | 41 | -1.779 | 9. | 42 | -1.696 |
| 10. | 43 | -1.612 | 11. | 44 | -1.529 | 12. | 45 | -1.446 |
| 13. | 46 | -1.362 | 14. | 47 | -1.279 | 15. | 48 | -1.195 |
| 16. | 49 | -1.112 | 17. | 50 | -1.028 | 18. | 51 | -0.945 |
| 19. | 52 | -0.861 | 20. | 53 | -0.778 | 21. | 54 | -0.695 |
| 22. | 55 | -0.611 | 23. | 56 | -0.528 | 24. | 57 | -0.444 |
| 25. | 58 | -0.361 | 26. | 59 | -0.277 | 27. | 60 | -0.194 |
| 28. | 61 | -0.110 | 29. | 62 | -0.027 | 30. | 63 | 0.056 |
| 31. | 64 | 0.139 | 32. | 65 | 0.222 | 33. | 66 | 0.306 |
| 34. | 67 | 0.389 | 35. | 68 | 0.473 | 36. | 69 | 0.556 |
| 37. | 70 | 0.640 | 38. | 71 | 0.723 | 39. | 72 | 0.807 |
| 40. | 73 | 0.890 | 41. | 74 | 0.974 | 42. | 75 | 1.057 |
| 43. | 76 | 1.140 | 44. | 77 | 1.224 | 45. | 78 | 1.307 |
| 46. | 79 | 1.391 | 47. | 80 | 1.474 | 48. | 81 | 1.558 |
| 49. | 82 | 1.641 | 50. | 83 | 1.725 | 51. | 84 | 1.808 |
| 52. | 85 | 1.891 | 53. | 86 | 1.975 | 54. | 87 | 2.058 |
| 55. | 88 | 2.142 | 56. | 89 | 2.225 | 57. | 94 | 2.643 |

Table 11 shows the Z-score of each raw score of adolescent students. After calculating the Zscores for all the raw scores, the range of Z -scores were divided into three levels, according to their corresponding raw scores, as shown in Table 12. According to Table 12, students having score $>74$ had high examination anxiety, students having score between 51 to 74 , had avarage examination anxiety and students with score $<51$ had low examination anxiety. The finding of

Table 13 present that $16 \%$ of students belong the high examination anxiety category, $66 \%$ of students in the avarage examination anxiety category and $18 \%$ of students remains in the high examination anxiety category.

Table 12. Norms for interpretation of $Z$ score

| Sl no. | Range of raw score | Range of Z score | Level of examination anxiety. |
| :--- | :--- | :--- | :--- |
| 1 | Below 51 | Below -1 | Low examination anxiety |
| 2 | 51 to 74 | -1 to +1 | Average examination anxiety |
| 3 | Above 74 | Above 1 | High examination Anxiety |

Table 13. Distribution of the sample in different levels of Examination Anxiety

| Sl no | Levels of anxiety | No of students | Percentage. |
| :--- | :--- | :--- | :--- |
| 1. | high | 325 | 16 |
| 2. | average | 1340 | 66 |
| 3. | low | 365 | 18 |

## 4. DISCUSSION and CONCLUSION

It is worthy to note that examination anxiety based research studies are often found in the case of children, but examination oriented research studies for an adolescent are rarely found especially in the context of West Bengal. This research successfully strives to measure the examination anxiety of the adolescents of the age group of 13-15 years and subsequently identify the students suffering from high examination anxiety. As the constructed Examination Anxiety Scale (EAS) having 21 items, possess high completion rate nearly 100 percent so it may be inferred that the scale may be administered easily with minimum supervision. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) have been conducted for determining construct validity. CFA has been applied to the different sample group, consisting of 402 number of adolescent students of the age group 13-15 years. Exploratory factor analysis revealed 4 factors, which was named as, Bodily Symptoms, Cognitive Dimension, Behavioural Reaction, and Emotional Reaction. EFA also yields 21 items. The final version of EAS, which was consisted of 21 items containing 15 positive items and 6 negative items. All the items have factor loading greater than .40. The final version of EAS was found to explain $44.16 \%$ of the total variance.
The final scale was applied, and confirmatory factor analysis has been executed on a sample of 402 adolescent students. All the fit indices such as, $\chi^{2} / D f, R M S E A, G F I, A G F I, C F I$ all were above acceptable values. CFA result showed that EAS has a good fit model, and it also confirmed the result of EFA. In this study, examination anxiety score of adolescent students is highly correlated with test anxiety inventory score by C.D Spielberger. The strong positive correlation between the constructed scale and Test Anxiety Inventory by C.D Spielberger which is considered as a standard established instrument is indicative of a high concurrent validity.
The constructed Examination Anxiety Scale (EAS) efficiently assesses the examination anxiety of adolescent students because it has high internal consistency reliability (Cronbach's alpha correlation coefficient 0.764 ), high test-retest reliability ( 0.801 ) and excellent split-half reliability (0.767)
In this study, the norms show that $16 \%$ of students belong to the high examination anxiety group, $66 \%$ of students in the average examination anxiety group, and $18 \%$ in the low examination anxiety group. This result stands nearly similar to the findings of Mary et al. (2014). In their study, they found that $8 \%$ of students remain in the high examination anxiety
category, $74 \%$ of students remain in the average examination anxiety category, and $18 \%$ of students in the low examination anxiety category.
This research enables to identify the problems based on high examination anxiety, and at the same time, it unleashes the purview for the teachers to resolve the problems through guidance and counselling. This study also corroborates that high examination anxiety oriented issues can be resolved by creating an ambient and congenial environment among the family members. It provides a relevant indication towards the faulty evaluation system, which causes examination anxiety among adolescents.

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## Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the author(s).

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## 5. REFERENCES

Abbasi, N., \& Ghosh, S. (2020). Effect of yoga on examination anxiety: A systematic review. International Journal of Psychosocial Rehabilitation, 24(8), 9113-9124.
Akkus, A. (2019). Developing a scale to measure student's attitude towards science. International Journal of Assessment Tools in Education, 6(4), 706-720.
Anastasi, A., \& Ubrina, S. (2005). Psychological testing. New Delhi, India: Prentice Hall of India Private Limited.
Browne, B. M., \& Cudeck, R. (1993). Alternative ways of assessing model fit. In: Bollen, K. A. and Long, J. S. (Eds). Testing structural equation models, Beverly Hills, CA: Sage.

Cassady, J. C., \& Johnson, R. E. (2001). Cognitive test anxiety and academic performance. Contemporary Educational Psychology, 27, 270-295.
Covington, M. V. (1985). Test anxiety: Causes and effects over time. In H. M. van der Ploeg, R. Schwarzer, \& C. D. Spielberger (Eds.), Advances in Test Anxiety Research, 4, 55-66. Lisse, The Netherlands: Swets \& Zeitlinger
Embse, N. V., Kilgus, S., Segool, N., \& Putwain, D. (2013). Test anxiety interventions of children and adolescents: A systematic review of treatment studies from 2000-2010. Psychology in the Schools, 50, 57-71. https://doi.org/10.1002/pits. 21660
Freeman, F. S. (1960). Theory and practice of psychological testing. New Delhi: Oxford \& IBH Publishing Co. Pvt Ltd.
Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. Review of Educational Research, 58(1), 47-77. https://doi.org/10.2307/1170348
Hodapp, V., \& Benson, J. (1997). The multidimensionality of test anxiety: A test of different models. Anxiety, Stress and Coping, 10(3), 219-244. https://doi.org/10.1080/106158097 08249302
Leech, L.N., Barrett, C.K \& Morgan, A.G. (2005). SPSS for intermediate statistics. London: Lawrance Erbaum Associates Publisher.
Liebert, R. M., \& Morris, L. W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. Psychological Reports, 20(3, PT. 1), 975978. https://doi.org/10.2466/pr0.1967.20.3.975

Lowe, P. A., Lee, S. W., Witteborg, K. M., Prichard, K. W., Luhr, M. E., \& Cullinan, C. M. (2008). The Test Anxiety Inventory for Children and Adolescents (TAICA): Examination of the properties of a new multidimensional measure of test anxiety among elementary and secondary school students. Journal of Psychoeducational Assessment, 26(3), 215230. https://doi.org/10.1177/0734282907303760

MacCallum, R.C., Browne, M. W., \& Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modelling. Psychological Methods, 1, 130-149
Mandler, G., \& Sarason, S. B. (1952). A study of anxiety and learning. Journal of Abnormal and Social Psychology, 47, 166-173
Mary, R. A., Marslin, G., Franklin, G., \& Sheeba, C. J. (2014). Test anxiety levels of board exam going students in Tamil Nadu. Hindwai Publishing Corporation Biomed Research International, 1-9. https://doi.org/10.1155/2014/578323
Mcdonald, S. A. (2010). The prevalence and effect of test anxiety in school children. An International Journal of experimental educational psychology, 21(1), 89-101.
Sarason, I. G. (1958). Interrelationship among individual difference variables, behavior in psychotherapy, and verbal condition. Journal of Abnormal and Social Psychology, 56, 339-344.
Sarason, I. G. (1959). Intellectual and personality correlates test anxiety. The Journal of Abnormal and Social Psychology, 59(2), 272-275. https://doi.org/10.1037/h0042200
Sarason, S. B., Davidson, K. S., Lighthall, F. F., Waite, R. R., \& Ruebush, B. K. (1960). Anxiety in elementary school children: A report of research. John Wiley \& Sons Inc. https://doi.org/10.1037/14349-000
Sarason, I. G. (1984). Stress, anxiety and cognitive interference reactions to test. Journal of Personality and Social Psychology, 66(4), 929-938.
Shukla, J. U. (2013). A study of examination Anxiety among secondary school students in the context of some variable. (Unpublished doctoral dessertation). Gujrat University, Ahmedabad, India.
Spielberger, C. D. (2010). Test Anxiety Inventory. New Jersey, USA: John Wiley \& Sons, Inc.
Suinn, R. M. (1969). The STABS, a measure of test anxiety for behavior therapy: Normative data. Behavior Research and Therapy, 7, 335-339.
Wine, J. (1971). Test anxiety and direction of attention. Psychological Bulletin, 76(2), 92-104. https://doi.org/10.1037/h0031332
Zeidner, M. (1992). How to high school and college students cope with test situations? British Journal of Educational Psychology, 66, 115-128.
Zeidner, M. (1998). Test Anxiety: The State of the art. New York: Plenum Press.

## 6. APPENDIX

Table A1 displays the 21 items of standardized English verison of examination anxiety scale for adolescent students.

Table A1. Examination Anxiety Scale for adolescent students (Standardized English version)

| Statements | Strongly <br> Agree | Agree | Undecided | Disagree | Strongly <br> Disagree | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. When I sit for an important examination, I feel thrilled. |  |  |  |  |  |  |
| 2. During examination I frequently feel the urgency to go to toilet. |  |  |  |  |  |  |
| 3. While taking an examination I feel uneasy and upset. |  |  |  |  |  |  |
| 4. Even after preparing well for the examination I feel very nervous. |  |  |  |  |  |  |
| 5. I often look at the other people during exams. |  |  |  |  |  |  |
| 6. My hands often sweat and feel cold before and during examination. |  |  |  |  |  |  |
| 7. During examination I think that I will surely pass the examination and get promoted. |  |  |  |  |  |  |
| 8. Worry about the result of the examination interferes with my performance during examination. |  |  |  |  |  |  |
| 9. After examination I think most of my answers are right. |  |  |  |  |  |  |
| 10. Sometime I tremble before or during examination |  |  |  |  |  |  |
| 11. During an important examination I suffer from headache. |  |  |  |  |  |  |
| 12. I feel relaxed while taking an examination. |  |  |  |  |  |  |
| 13. During examination I often check the time. |  |  |  |  |  |  |
| 14. After an examination I say to myself, it is over and I did my best. |  |  |  |  |  |  |
| 15. I never play with my pencil or pen during an examination. |  |  |  |  |  |  |
| 16. My thought wander during examination. |  |  |  |  |  |  |
| 17. I feel very confident while I taking an examination. |  |  |  |  |  |  |
| 18. I think about current events during an examination. |  |  |  |  |  |  |
| 19. My mouth becomes dry before or during an important examination. |  |  |  |  |  |  |
| 20. I feel very jittery when talking an important examination. |  |  |  |  |  |  |
| 21. Before or during examination I think other students are brighter than me. |  |  |  |  |  |  |


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