

Construction and Standardization of Research Anxiety Scale for Research Scholars

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Abstract

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Abstract:

The research anxiety scale has been developed and standardized by the investigator for PhD. Research scholars. The initially draft of the tool consisted of 74 items, later after discussions with the experts and administration of the tool on the research scholars, 32 items were retained. After thorough item analysis the final draft of the test retained 28 items. The reliability was found to 0.62 which was calculated by test re-test method. Validity was established by concurrent validity method for which the present scale was correlated with Research anxiety rating scale by Onwuegbuzie (2011). The validity index comes out to be 0.56.

Key words: Construction, standardization, Research anxiety, Ph.D. research scholars.

Introduction

The foremost requisite for pursuing educational research on empirical lines is the availability of reliable, valid and standardized tools. The purpose of the research study can be fulfilled by using the tools for measuring the variables of research attitude, research self-efficacy and research anxiety. Thus, the standardized tools of these variables were searched out by the investigator and the investigator could find out the tools for measuring research attitude and research self-efficacy but no suitable tool for measuring research anxiety was found. Therefore, it became necessary for the investigator to construct and standardize an appropriate tool for collecting data

pertaining to research anxiety among research scholars.

The concept of research anxiety has been designed and frequently revised from the last two decades. A critical review of the scales already standardized was carried out thoroughly which was the requirement as well as fundamental base line for the development of the tool.

1 The process of scale construction

The process of scale construction was carried out in three stages: Planning stage, Construction stage and Standardization stage

1.1 Planning Stage: It involved the following points:

- i. Identification of the categories of the feared situations causing Research anxiety
- ii. Operational definition of Research anxiety
- iii. Methodology of scale construction

I) Identification of the categories of the feared situations causing Research anxiety

In order to examine the actual situations felt by research scholars with research anxiety journals, published papers, books and web sources were explored and these sources helped the investigator to know that research scholars with research anxiety have excessive and persistent fear of research related activities. The two categories of these feared research situations are performance aspect and emotional aspect.

Performance aspect are those in which research scholar has fear of doing activities related to research, for example fear of statistical analysis, fear of report writing, fear of research language, fear of library etc. The emotional aspect includes situations where researcher has personality constraints, for example not able to concentrate, broken sleep in worrying, losing confidence and thinking of self as worthless etc.

So the present scale on research anxiety was constructed on the above mentioned categories of feared situations contributing towards research anxiety.

II) Operational definition

Research anxiety may be considered as mental and neural state of mind with persistent fear, discomfort, stress and anxious mood during their research work wherein the researcher have lack of confidence in conducting research, mastering research methods and defending the dissertation before research committee.

III) Methodology of scale construction

The scale was constructed on the Likert's (1932) technique of 'summated Rating' for ascertaining the responses on the scale as it is the most commonly used scale for the collection of data in the field of behavioral sciences studies. The five point rating scale which includes a continuum of alternative responses is used in the construction of present tool. Numerical weights are assigned to the categories to strongly agree, agree, undecided, disagree, and strongly disagree as 5, 4, 3, 2, 1 respectively in case of positive statement. For negative statement strongly agree, agree, undecided, disagree, and strongly disagree as 1, 2, 3, 4, 5 respectively.

1.2. Construction Stage: This phase included the following steps:

I) Preparation of item pool

The investigator critically studied the literature available on research anxiety from books, journals of psychology and medical and web sources were also explored extensively. Many experienced psychologists, teachers and experts were also consulted to understand the anxiety aspect particularly associated with research.

The investigator framed statements of the scale on the basis of information gathered from related review of literature, books and journals. In the preliminary draft, the tentatively framed statements on

research anxiety were 74. The statements were then discussed thoroughly with supervisor and necessary modifications were made.

II) Editing of the items and provisional draft

The items of the tool were reviewed and edited keeping in mind the suggestions by Likert (1932), Thurstone and Chave (1929), Bird (1940), Wang (1932) and Edwards and Kilpatrick (1948).

Preliminary draft consisting of 74 items was needed to be examined for the grammatical mistakes, repetitiveness, and ambiguity of the statements. For this purpose the investigator approached 9 experts in the field of research and education.

Personal request was made to these experts for sparing their valuable time and to provide serious reflection over every statement framed and also to give their valuable suggestion about statements proximity to the connotation in question. Operational definition was given in written form before the statements. Further, several discussions were made with experts so that proper understanding about the scale and the statements could be made. The written form

of the scale was provided with the suggestion column with each statement. The supervisor and investigator devoted many sittings to frame more valuable statements on the basis of comments given by experts on the statements relating to different segments of research anxiety. After deliberations, a pool of 32 items was finalized for the provisional draft of research anxiety scale.

III) Directions for respondents

The following directions were given to respondents:

- i) Fill in the information regarding your name, father's name, gender, course, department, university, year of registration in Ph.D.
- ii) Read the instructions carefully
- iii) On the following pages 32 statements regarding Research Anxiety have been given. Read each statement carefully and decide your response on the five points. For indicating the response alternatives a five-point scale is given against each statement like below:

Table 1: Response Alternative

Sr. No	Statement	Response Alternative				
		Strongly agree	Agree	Undecided	Disagree	Strongly Disagree

- iv) Mark a tick (✓) in the appropriate box of any one of the five response alternatives which

are indicated against all the statements.

- v) You are requested to answer all the 32 statements honestly without any hesitation.
- vi) Your answers will be kept confidential and these will be used only for research purpose.

IV) Try out of the scale

The try-out of the tool was carried out on 40 research scholars from the discipline of Social Science of Panjab University, Chandigarh. Discipline of social science included faculties of Education, Public Administration, Psychology, Sociology, Philosophy, Political science, Economics, history and Geography. The research scholars were asked to fill up their particulars such as name, gender, department etc. printed on front page of the scale. The data obtained from 40 research scholars on provisional draft of research anxiety scale was noted down for the purpose of item analysis.

V) Item analysis

It is done to select or reject the items of a test on the basis of their difficulty value and discriminative power. The objective of item analysis includes:

- Selecting the appropriate item for the final draft and rejecting the poor items which do not contribute in the functioning of the scale.
- Item analysis obtains the difficulty values of all the items of preliminary draft of the scale. Here the statements are categorized in difficult, moderate and easy statements.
- It gives the discriminative power to differentiate between capable and

less capable testees of all the statements of the preliminary draft of the scale. The discriminative indexes used for this strategy are positive, negative and zero discriminations. Statements having positive discrimination value are selected for the final draft whereas statements having negative or zero discrimination value are rejected.

- It also provides the information about the functioning of multiple choice items and tells which choice among the choices is distracting. The extra powerful and poor distracters are changed.

As this scale is in the form of rating scale so it cannot be evaluated in terms of any right or wrong responses. Thus concept of item difficulty is not applicable over here. So for the present tool construction only item discrimination index worked out on the basis of obtained results.

Item discrimination index

The extent to which the given items discriminate among high and low group are called discrimination index. According to Kelley (1939) "It is suggested that items may be studied best when whole experimental samples yield 50% right responses and that upper and lower groups consisting of 27% from the extremes of the criterion score distribution are optimal for the study of test items, provided the differences in criterion scores among the members of each group are not utilized". Investigator used Kelley's dichotomy to obtain the high and low groups. First of all, scores of 40 research scholars obtained through try-out of the tool were arranged in descending order. Then 27% top and 27% bottom scores formed the higher and lower

group respectively which comes out to be 11 research scholars in each group. To find out the discriminative power of the various items, the mean of every item for the higher and lower group were compared. Following formula was used for calculating item discriminative power:

$$\text{Discrimination Power} = \frac{\sum H - \sum L}{\frac{N}{2}}$$

Where, $\sum H$ = sum of all scores of a particular item responded by higher group

$\sum L$ = sum of all scores of a particular item responded by lower group

N = Total no. of respondents in higher and lower group

Item analysis was done by following the above formula to obtain discriminative power for every item included in the provisional draft of 32 statements of research anxiety scale. This was done for the objective and scientific selection of the items for the final tool.

VI) Selection of items and preparation of the Final Draft

The final draft of the research anxiety scale was prepared on the basis of discriminative power of each item, The items falling within the range of 0.20 to 0.95 in discrimination power were selected for the final tool. This leads to the selection of 28 items and 4 items were eliminated. In this process, in all 4 items having serial numbers 5, 9, 15, 32 in the provisional draft of the research anxiety scale were rejected. Hence, final draft of the research anxiety scale comprised of 28 items.

The Final draft of the research anxiety scale has been appended with thesis (Appendix III)

VII) Scoring Procedure

Each item has a response option on Likert' 5 point continuum viz, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree with respective weights of 5, 4, 3, 2 and 1. The total score of the research anxiety scale is the sum of maximum score of all the items. So the theoretical range of scores is 28 to 140, high scores reflect relatively higher level of research anxiety among research scholars and vice-versa.

1.3 Standardization Phase

1) Determination of Reliability of the scale

A measurement procedure is reliable to the extent to which it provides constant results on repeated measurements. Test reliability tells that to what extent individual differences of score can be assigned to chance errors. According to Guilford (1954) 'reliability is the proportion of the true variance in obtained test scores'. According to Garrett (2004) 'the reliability of the test or any measurement instrument depends upon the consistency with which it gauges the ability to which it applied'. According to Anastasi (1982) 'reliability refers to the consistency of scores obtained by the same individuals when re-examined with the same test on different occasions or with different sets of equivalent items or under other variable examining conditions'. Reliability is defined mathematically as the ratio of the variation of the true score and the variation of the observed score, or, equivalently, one minus the ratio of the variation of the error score and the variation of the observed score.

There are four general types of determination of reliability

- Parallel Form reliability
- Split-half reliability

- Rational Equivalence reliability
- Test-retest reliability

Test-retest reliability criterion was found to be most appropriate for determining reliability of the scale. For determining the reliability of the research anxiety scale, the scale was administered to 40 research scholars of Panjab University, Chandigarh who were not included in the experimental sample of population. The same scale was administered on same 40 research scholars under the similar conditions after keeping the gap of three weeks. The Pearson's co-efficient of correlation between the two sets of scores was calculated. It was found to be 0.52. This was found satisfactory to testify the reliability of the scale.

2) Establishing the validity of the scale

Validity is the extent to which a test measures what it purports to measure. It means the accuracy with which a set of test scores measure what they ought to measure. According to Ebel (1979), "Validity refers to the consistency (accuracy) with which the scores measures a particular cognitive ability of interest. There are two aspects of validity: what is measured and how consistently it is measured." According to Freeman (1962), "An index of validity shows the degree to which a test measures what are purports to measure when compared with accepted criterion." The concept of validity of a test, therefore, is chiefly a concern for the 'basic honesty' of the test. Honesty in the sense of doing what one promises to do. So, validity refers to how well a tool measures what it intends to measure.

The degree to which the test measures the traits which it is used to

measure is the relevance of the test. The validity of test, then, is the relevance of the test. So, validity can be defined as the degree to which the test measures accurately whatever it is supposed to measure. Validity of a test can be established in four ways:

For the establishment of concurrent validity of the scale, the scale was validated by concurrent validity index. For determining the concurrent validity for the present scale it was correlated with already existing scale of research anxiety i.e. Research anxiety rating scale by Onwuegbuzie (2011) for the validation, Pearson product moment correlation index between the present scale and the concurrent scale was measured. Validity index comes out to be 0.56 which indicates that investigator's scale has a very good concurrent validity and it can be used safely as a tool of measuring research anxiety.

3) Setting the time limit for the test

The average time taken by 75 percent examinees to reach the last item was fixed as the duration of the test which comes out to be 20 minutes including the time for reading instruction for responding to the test.

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