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Construction and Standardization of Career Preference Inventory

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Abstract- This paper describes the construction and standardization ofthe Career Preference Inventory which is a 121 item, individually or group administered assessment of 11 major career interest fields. There were 16 major career fields and 514 sub careers reviewed by the researcher. After pre try out and compiling all the suggestions of the expert committee 11 major career fields and 242 sub careers were shortlisted. The average test re-test reliability of the inventory was 0.83 and 0.77 after 15 days and 30 days respectively on a sample of 300 students of secondary class. The value of inter-item correlation of the Career Preference Inventory was 0.165 to 0.574 for all 11 career fields. For establishing criterion validity, the correlation was established with the items of Career Preference Record of Bhargava and Vocational Interest Record of Kulshrestha. The value of criterion-related validity found was 0.723 and 0.738 for Career Preference Record and Vocational Interest Record respectively. The researcher used the Stanines score for norm-referenced interpretations of the score.

Keywords: Career, Preference, Construction, Standardization, Inventory

I. INTRODUCTION

Career planning is very essential for a bright future for adolescents. Every adolescent should be very careful in choosing one's career so that it fits him or her perfectly. Choosing a satisfying career should be the mission of today's youth. In the present system, ten-year general schooling focuses on basic knowledge and activities related to different subjects. After the secondary stage, the students have to choose a stream for two years of senior secondary education, followed by three years of graduate-level education. An individual who learns decision-making early in life has an advantage over the person who moves along deciding matters by hit and trial method. Hence, a person's life may be seen as a string of career decisions reflecting an individual's groping for an ideal fit between self and work (Bordin,1984). Drucker (1969) views that various choices and many opportunities tend to bewilder an individual who gets distracted due to their multi-directed scope. It is a problem not only of the individual but also of the society, which has the responsibility of optimum utilization of its sources. Therefore, the researcher decided to take up the challenge of constructing and standardizing an inventory to find the career preference of adolescents, which will help them to choose a suitable career/course.

There are many career interests' schedules or inventories which are developed by different researchers in the past. Thurstone (1927) divided his interest schedule into ten rows and ten columns. In each of 100 boxes, there are pairs of occupations and the subject is asked to mark his preference in each box. In this interest schedule, 10 major vocational fields are physical science, biological science, computational, business, executive, persuasive, linguistic, humanitarian, artistic, musical. Strong's Vocational Interest Blank (1935) consists of 11 groups and 50 categories. In scoring the inventory, each item has weights assigned to its response positions. Kuder's Preference Record-Vocational (1946) contains 504 items, each offering three possible choices. The individual reads the three choices and indicates which he likes least. By adding the credits, a total score is obtained for each area of vocational interest. Holland's Vocational Interest Theory (1985) suggested six types of interest realistic, investigative, artistic, social, enterprising, and conventional. The theory states that a person's personality is a composite of all of the types and each person has a unique combination. Athanasou's Career Interest Test (1988) is an individually administered instrument having 63 items, grouped into 7 vocational interest categories. The seven vocational categories are scientific, outdoor, creative, practical, office, business and people contact. The Career Interest Test is intended for use primarily by adolescents seeking career guidance. Multi Factor Interest Questionnaire by Kapoor & Singh (1992) consists of eight major categories which are business, clerical, agriculture, mechanical, scientific, outdoor, aesthetic, and social. In every item, one specific situation of actual life is given and the subject is required to tell what he/she will prefer to do in that particular situation. Bhargava & Bhargava (2001) developed a career preference record to help the students to make a wise career choice. CPR covers 10 main areas of vocational interest. Two vocations are mentioned in each box of this inventory. Students can mention their choice from the two vocations

given in each box. Vocational Interest Record by Kulshrestha (2017) contains 200 vocations belonging to 10 different vocational interest areas such as literary, scientific, executive, commercial, constructive, artistic, agriculture, persuasive, social, and household. Two vocations are mentioned in each box of this inventory. Students can mention their choice from the two vocations given in each box.

Construction

Construction usually means to make, to create, or to construct. In the present study, the word 'Construction' is used to refer to the construction of career preference inventory.

Standardization

To make an inventory standardized is called standardization. Standardization of career preference inventory is done based on the validity and reliability of the inventory. Good (1945) stated that a standardized test is a test in which content has been selected and checked empirically, for which norms have been established, for which uniform methods of administration and scoring have been developed and which may be scored with a relatively high degree of objectivity.

Career Preference

A career is defined by the Oxford English Dictionary as a person's progress through life. Preference means the favourable evaluation of some course of action, as compared to other possibilities that are rejected. Giving preference for a career is an expressive act which reflects a person's motivation, knowledge, personality, and ability. Eyo&Edet (2011) views that a career choice is a decision that most human beings make in their lives.

Inventory

Inventories are different from tests. In an inventory, there is no objectively correct answer. An inventory response of an individual cannot be marked as right or wrong.

Importance of the study

The adolescents at high or higher secondary stages have to face the problem of choosing suitable educational courses leading to career choices. This inventory will help them to find their career preference. On one side the inventory will help the students to choose their suitable career, on the other side, it will also provide brief information of 242 careers popular in India at present. CPI will be also useful for parents to decide about the career and course of their children after 10th grade. With the help of this inventory educationists, career counsellors and teachers will be able to guide the students in a better way.

II. CONSTRUCTION AND STANDARDIZATION

Theconstruction of a test is a hard task. A good test does not just happen. It requires patience, hard work, and plenty of knowledge on the part of the investigator. According to Brown (1987) and Harris (1961), a good test should have three characteristics – reliability, validity, and practicality. Adkins (1974), Kline (1975), Ahmann and Glock (1981), Gronlund (1988), and Rust &Golombok (2009) claim that a good test must be reliable and valid. If a testconstructor determines to prepare a good test, he or she must have a clear answer to two questions what to measure and how to measure? To have the correct answer to these questions the investigator has passed through the following stages to construct and standardize the test:

I**.** Planning Phase

II. Construction Phase

III. Standardization Phase

I. Planning Phase:

From the literature review and keeping in mind the objectives of the study it was decided that career preference inventory will be constructed for adolescents using methodology of Thurstone (1927), Bhargava (2001) and Kulshrestha (2017). It would include 8 to 16 major career interest fields. It was also decided that the inventory will be standardised on students of 10^{th} grade which will be chosen randomly form senior secondary or high schools of district Bathinda (Punjab).

II. Construction Phase:

In this phase following steps were taken by the researcher:

(i) Identification of major career fields and career options:

(A) The researcher analysed the fifteen most popular career interest inventories developed in India and abroad. The purpose of this analysis was to identify the career major and subfields taken into consideration by the majority of the investigators in developing their tools.

(B) The researcher thoroughly studied the National Classification of occupations 2015 published by the Ministry of Labour & Employment and Directorate General of Employment (Govt. of India). The National Classification of Occupations 2015 attempts to group occupations according to combinations of specific duties, tasks, and work functions concerned with performing the closely related work.

(C) Analysis of all Punjab and Central government recruitment advertisements of the last 5 years.

There was a total of 16 major career fields and 514 sub careers reviewed by the researcher.

(ii) Expert Review:

After that, the researcher discussed all 16 major fields and sub-career fields with 36 well-known educationalists, experts of the test construction, experts of concerned fields, senior faculty of colleges, and senior secondary schools. After compiling all the suggestions of the expert committee 11 major career fields and 242 sub careers were shortlisted by theresearcher.

(iii) Pre-try-out for career fields selection and modifications:

After the initial selection of 11 major fields and 242 career subfields, the career preference inventory was applied to 100 students of 10th grade of two senior secondary schools of Bathinda district. They were given the option to mention any other career field in which they were interested. After completing the test, the researcher discussed the problems faced by the students in completing the test. According to students, there were several career fields in the test from which they were notfamiliar.

(iv) Preparing a brief description of all 242 fields:

After the first try out it was realized that it was a major problem for students to be unfamiliar with several careers. To make career preference inventory more realistic and practical, the researcher collected the brief detail of 242 careers and compiled them in a booklet. Now before conducting a career preference test each student will be provided this booklet and after 3-4 days, CPI will be conducted on these students.

(v) Directions for respondents:

Based on the literature review, expert advice, and pry try-out experience, directions for respondents were framed. The major consideration for framing directions was to make the simplest and easily understandable.

(vi) Try out of the inventory:

After having the permission of the principals of two schools of Dist. Bathinda the booklet of 242 careers provided to 10th-grade students. They were given a time of 4 days to study it. After 4 days Career Preference test was conducted on 100 students. The purpose of the try-out was to see if the students were able to understand the language and sense the level of items prepared for their age group. The administration was supervised individually and feedback was recorded to make required modifications for the test items. Scores were awarded for different response choices made by the students.

(vii) Preparation of Final Draft:

Based on try out and discussion with experts required minor corrections were made in the inventory and instructions. Now Career Preference Inventory was ready with finally selected 11 major career fields (Agriculture & Allied Services, Defence Forces, Teaching & Training, Science and Engineering, Commerce & Management, Law Enforcement & Administrative, Medical & Health, Visual & Performing Arts, Journalism & Mass Communication, Skilled & Self Employment, Tourism & Hospitality)and 242 sub-career fields. Fully attention was given to make it simplest according to 10th-grade students.

(viii) Scoring system:

In Career Preference Inventory each major field has 22 careers out of which 11 are arranged row-wise and 11 columns-wise. After conducting the test row-wise and column-wise preference of each field will be counted. Each preference of a career will carry 1 mark. So, the maximum marks a field will carry will have 22*1=22 marks and a minimum of 0 marks.

III.Standardization Phase:

According to Cronback (1960) 'The procedure, scoring and evaluation of a standardized test, everything is definite so that it may be used at different occasions. In such a test, the table of norms and the possible score of representative students of any group is known.' Following steps were taken by the researcher at this stage:

(i) Determination of the test-retest reliability of Career Preference Inventory

There are many methods by which the reliability of the test measures can be established. From the literature review, it is observed that similar existing tools such as CPR by Bhargava and VIR by Kulshrestha have used the test-retest method to find the reliability of the inventory. So, the researcher also used the test-retest method to find the reliability of the Career Preference Inventory. Test-retest reliability involves administering the test twice to the same group of respondents, with an interval between the two administrations of, say, one month. The reliability coefficient will be obtained by using the product-moment correlation method. The researcher conducted CPI on 300 students. After a gap of 15 days, CPI was repeated on 100 students. Similarly, after 30 days CPI was repeated on other 100 students to find test-retest reliability. The test-retest reliability found in both the cases are mentioned below:

Table 1. Coefficient of correlation between two administrationsof CPI (N=100)

Sr. no.	Name of field	Coefficient of (Pearson) correlation using SPSS (after 15 days)	Coefficient of (Pearson) correlation using SPSS (after 30days)
1	Agriculture & Allied Services	0.90	0.77
2	Defense Forces	0.73	0.84
3	Teaching & Training	0.87	0.82
4	Science and Engineering	0.83	0.74
5	Commerce & Management	0.87	0.79
6	Law Enforcement & Administrative	0.79	0.80
7	Medical & Health	0.89	0.83
8	Visual & Performing Arts	0.84	0.76
9	Journalism & Mass Communication	0.85	0.65
10	Skilled & Self Employment	0.81	0.76
11	Tourism & Hospitality	0.83	0.74

(ii) Determination of internal consistency of Career Preference Inventory

The Career Preference Inventory has also shown satisfactory reliability using average inter-item correlation. This method measures the internal consistency reliability of an inventory. It shows the consistency of the different items that are meant to measure the same thing or idea. Table no.2 shows the inter-item correlation between 11 career fields. It is based on a sample of 300 students of 10th grade. The values of the table show homogeneity of different careers, so it ensures high internal reliability of the Career Preference Inventory.

Table 2. Inter-item correlation of 11 career areas of Career Preference Inventory (N=300)

	AG	DF	TT	SE	CM	LA	MH	VPA	JMM	SSE	TH
AG	1.000										
DF	0.379	1.000									
TT	0.263	0.196	1.000								
SE	0.425	0.460	0.291	1.000							
CM	0.370	0.344	0.438	0.533	1.000						
LA	0.331	0.517	0.361	0.473	0.574	1.000					
MH	0.449	0.332	0.346	0.441	0.463	0.418	1.000				
VPA	0.341	0.165	0.360	0.296	0.390	0.278	0.423	1.000			
JMM	0.348	0.354	0.371	0.474	0.484	0.406	0.443	0.519	1.000		
SSE	0.484	0.298	0.253	0.350	0.393	0.274	0.445	0.469	0.527	1.000	
TH	0.433	0.326	0.304	0.381	0.481	0.392	0.477	0.445	0.487	0.493	1.000

(iii) Validity of the test

Validity is concerned with whether the test is measuring what is supposed to measure (Rust and Golombok, 2009). Validity is a relative term. A test is not generally valid. It is valid only for a particular purpose. To estimate the validity of the present test the administrator adopted two methods. They were:

1. Face validity:

For face validity, experts of education and concerned career fields, as well as career counsellors of senior secondary schools, were consulted and their suggestions were obtained. When necessary, personal meetings were arranged and their guidance was sought. Thus, the changes in components and items were made according to their suggestions and it shows the face validity of theinventory.

2. Criterion-related validity:

In Criterion-related validity test scores are compared with the scores obtained on a criterion available at present. For establishing criterion validity, the correlation was established with the items of Career Preference Record of Bhargava and Vocational Interest Record of Kulshrestha. CPR by Bhargava has 10 fields similar in CPI and VIR by Kulshrestha has 6 career fields that are somewhat similar to CPI. So, the criterion-related validity correlation between student's preference calculated and it is presented in the below table:

Table 3.Criterion-related validity between CPI and similar existing scales

Similar Existing Scales	Major Career fields										
	Agriculture	Defense Forces	Teaching & Training	Science and Engineering	Commerce & Management	Law Enforcement & Administrative	Medical & Health	Visual & Performing Arts	Journalism & Mass Communication	Skilled & Self Employment	Tourism & Hospitality
CPR Bhargava (N=50)	0.66	0.73	0.80	0.77	0.78	0.74	0.78	0.63	0.57	-------	0.77
VIR Kulshrestha (N=50)	0.74	------	------	0.78	0.79	0.73	------	0.70	-------	0.69	-----

(iv) **Establishing norms for Career Preference Inventory**

There are two ways for interpreting the results:

1. Ranking of careers

A person's career preference is defined by the highest scores obtained on the Career Preference Inventory. The lowest score indicates the least preferred career. In this method, we simply determine the rank order of career preference categories.

2. **Norm-referenced interpretations**

The term norm can be defined as the average performance of a group of individuals. Norm-referenced interpretations of scores are based on a direct comparison of an individual's performance with some fixed standard norms. In this method, the standard scores are determined from the raw scores after the administration of the scale.

'Norms are measurers of achievement which represent the typical performance of some designated group or groups' (Garrett,2015). After carrying out the final run, the establishment of the score is of much importance in establishing the norms. The researcher used the Stanines score for norm-referenced interpretations of the score. It is a nine-point scale that is similar to normal distribution. Using excel sheets researcher found the following values of the stanines scale in all 11 major career fields:

Table 4. Classification of career preference according to norms

Stanine	Raw Score	Career Preference Level
I	0-5	Low career preference
II,III	6-9	Below average career preference
IV,V,VI	10-13	Average career preference
VII,VIII	14-17	Above average career preference
IX	18-22	High career preference

III. CONCLUSION

The adolescents at high or higher secondary stages have to face the problem of choosing suitable educational courses leading to career choices. Therefore, the researcher decided to take up the challenge of constructing and standardizing an inventory to find the career preference of adolescents, which will help them to choose a suitable career/course. The inventory passed through the planning, constructive and standardized phase. The psychometric base for this inventory lies in Thurstone's (1927) pair comparison methodology. In this methodology a person chooses between pairs of careers. First of all, the researcher analysed the most popular career interest inventories developed in India and abroad. The purpose of this analysis was to identify the major interest fields and different careers taken into consideration by the majority of the investigators in developing their tools. There were 16 major career fields and 514 sub careers reviewed by the researcher. After pre try out and compiling all the suggestions of the expert committee 11 major career fields and 242 sub careers were shortlisted. Based on the experience of two try outs on 200 students of secondary class students, the researcher made the necessary changes in the inventory. Test-retest reliability of Career Preference Inventory was determined using product-moment correlation method. The average test re-test reliability of the inventory was 0.83 and 0.77 after 15 days and 30 days respectively on a sample of 300 students. Internal consistency of Career Preference Inventory was determined using average inter-item correlation. Value of inter-item correlation of Career Preference Inventory was 0.165 to 0.574 for all 11 career fields. For establishing criterion validity, the correlation was established with the items of Career Preference Record of Bhargava and Vocational Interest Record of Kulshrestha. CPR by Bhargava has 10 fields similar in CPI and VIR by Kulshrestha has 6 career fields that are somewhat similar to CPI. The value of criterion-related validity found was 0.723 and 0.738 for Career Preference Record and Vocational Interest Record respectively. After carrying out the final run, the establishment of the score is of much importance in establishing the norms. The researcher used the Stanines score for norm-referenced interpretations of the score.

The inventory was carefully planned, designed, and standardized. On one side the inventory will help the students to choose their suitable career, on the other side it will also provide brief information of 242 popular careers in India. CPI will be helpful for parents to choose best suitable career and course for their children after 10th grade. With the use of this inventory educationists, career counsellors and teachers will be able to guide the students in a better way.

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