I FORCED-CHOICE TECHNIQUE

Travers\(^1\) attributes the origin of the forced-choice technique to Paul Horst. The idea occurred to him in the first instance was actually put into practice in the form of a personality inventory by Wherry. It was also used in the rating of the personnel in the American army. The origin of this technique emanated due to the main drawback of the rating method—its subjectivity. In the self-ratings the problem of faking was serious enough to warrant consideration whether the personality inventories of the traditional type could be considered at all for the purpose of personality measurement. The forced-choice technique was developed with a view to overcoming this drawback. It is of very recent origin. Kuder\(^2\) made use of the idea in constructing his Preference Record, and later on Jurgensen\(^3\) in his classification inventory. The technique was put to use in rating in the American army during the second world war.

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various tests to examine its merits which it claimed to possess. But still there is a good deal of scope for examining this technique by putting it to use in the form of rating scales and interest inventories.

The present work was aimed primarily at constructing an interest inventory based on this technique, the value of which was tentatively established. The inventory might in turn help to examine the technique by its application and subsequent comparison with other measuring instruments. This technique as applied to the construction of an interest inventory consists in going through the following essential steps:

* A large number of items describing the area of interest being measured are collected.
* These items are edited and the items having ambiguous meanings or vagueness are eliminated or modified.
* These are assembled in the form of an inventory and administered to a random sample of the population for which the inventory is to be standardized.
* The data obtained are used to calculate two indices, viz., preference index and discriminating index for each of the items.

(b) Susson, op. cit. pp. 365-8.
(c) Travers, op. cit., pp. 62-70.
The items are arranged in pairs in such a way that the two items are of equal or almost equal preference values and differ in terms of their discriminative values.

The pairs thus obtained are assembled in an inventory and it is administered to two groups of persons which stand at the opposite poles of the areas being measured. These criterion groups are selected on the basis of independent measures such as ratings or clinical diagnosis.

Each item is cross validated on the basis of the above data, or the inventory is cross validated as a whole. In the former case the pairs of items that are valid on the basis of this data are retained in the final form.

The final form is administered to another large and random sample of the population.

The reliability and norms are determined.

The above procedure differs from the normal procedure of test construction in introducing two new concepts: Preference index and discrimination index.

Preference Index

The preference index has been calculated by different people in different ways. But the idea underlying this is to match two items for their acceptability value. It is common criticism that in the check list method or inventories having a list of questions or objectives the subjects endorse the favourable statements as applicable to them and reject those
that are unfavourable. To overcome this drawback the items are arranged in pairs and the subject has to accept one which is more applicable to him than the other. Because the two items are matched for acceptance value the choice is based on facts. The subject chooses the one which is more liked by him when they are equally desirable or undesirable. In this way the factor of the social desirability of the items is controlled.

**Discrimination Index**

The discrimination index refers to the validity index of the item. It is the extent to which the item discriminates between those high and those low on the dimension being measured.  

while choosing from two unfavourable activities or statements he is more likely to choose the one which is less liked by him rather than the one which is not liked at all.

The arrangement of items is done in different ways. Though pairs only were mentioned, so far, for the sake of simplicity and clarity, there can be anywhere from two to five items in a unit.

Kuder\(^7\) used a unit of three for his preference records. Susson\(^8\) has described a unit of four as being used in the army ratings. Gordon\(^9\) also used a unit of four in his personal profile. Edwards\(^10\) used a unit of two in his personal preference schedule. The principle involved in scoring any such groupings, is that the subject, under proper directions, chooses an item or items in terms of their desirability or undesirability to his own behaviour or the behaviour of the ratee he is rating, as the case may be. Suppose, for example, in the unit of two, the subject chooses one as the more favourable, the other is automatically decided as the non-favourable. In units of three the subject chooses one that is most favourable and also one that is least favourable. The item left out has a middle rank. In tetrads, i.e. the unit of

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four, there are two favourable statements and two unfavourable ones. The subject chooses one which is most desirable of him and one which is least desirable.

The relative value of these different groupings has been studied but still the results are far from conclusive. Where the subjects are not sophisticated and not used to tests, the simplest form of two items in a group should prove most favourable. In the present study the two-item unit is chosen for the same reason. Moreover, it does not mean any sacrifice of the value of the inventory as a measuring instrument.

III SOME MORE ARGUMENTS FAVOURING THE USE OF FORCED-CHOICE INSTRUMENTS

1. The forced-choice technique operated to keep inter-correlations low, thus providing the instrument a greater potential for validity.

2. The forced-choice technique parallels more closely actual life situations where one cannot do all the things he would like to do but regularly elects one course of action in preference to alternatives even fairly attractive alternatives. In this sense, forced-choice testing functions as a realistic microcosm of everyday behaviour.

3. The forced-choice technique tends to control "response-set" - differences in response enthusiasm between individuals and also from occasion to occasion within one individual. In addition, the forced-choice technique is likely to be more resistant to faking than is the
free-response technique.

4. The forced-choice technique usually provides higher reliabilities than the free-response technique. Kuder has shown that the forced-choice format evokes a high level of behavioral reliability in responding to the items and the consistent evidence of high reliability for various forced-choice instruments is quite convincing.

5. The research literature indicates clearly that such instruments as the Kuder vocational yield useful validities in terms of discriminating among various vocational groups.

IV A BROADER ISSUE

While these arguments bring certain issues into focus, there appears to be a still broader issue: Before taking a position for or against forced-choice testing, we need to identify carefully the criterion behaviours we are trying to predict. Only then can we seek to identify the testing technique that holds the most promise for overlapping the criterion behaviours.

Some criteria are themselves forced-choice in nature, and in these cases forced-choice testing instruments should evoke more behaviours common to the subsequent criterion behaviours. For example, job entry represents a forced-choice situation,

and we may, therefore, expect that forced-choice inventories will provide useful predictions of behaviors in this circumstance. Selection of school electives is another case in point: In high school or college one cannot take all of the courses he would like and hence one is forced to choose among them and we, therefore, expect that forced-choice inventories will provide useful predictions of behaviors in this circumstance. Selection of school electives is another case in point: In high school or college one cannot take all the courses one would like. He is forced to choose among them and we, therefore, expect forced-choice inventories to help predict his behavior. Both of these contentions are supported by a wide variety of research studies. Illustrative of this general point, Frandsen reported a correlation of .54 between the Kuder - Vocational Scientific Score and percent of natural science courses taken in high school, and a correlation of .32 between the Kuder Social Service Score and percent of social studies courses taken in high school.

V THE PREFERENCE AND DISCRIMINATION INDICES

Forced-choice technique found its application, in the standardization of rating procedures, the rating by others as well as self-ratings. Its chief merit lies in its capacity to overcome bias in the ratings. First of all, much more thought needs to be given while answering a forced-choice item than a single item of the rating scale or interest.

inventory. When the item is to be endorsed as favourable or not, there is a latitude for an individual to take into account various degrees of favourableness while endorsing the statements and one often uses different degrees with different items. In case of the forced-choice item one has to choose a statement as more or less favourable than the other, and thus the response is more controlled and the subjectivity of judgement is reduced.

VI THE PLAN OF WORK

In the light of the foregoing discussion the following steps were planned in the construction and standardization of the present inventory:

The steps in the present work:

1. The items belonging to the eleven areas of interest should be collected. They were: administrative, computational, mechanical, natural and outdoor, scientific, teaching, fine arts, literary, clerical, persuasive and social service.

2. These items were to be edited and assembled in an inventory.

3. The inventory was to be administered to a sample of the population for which the inventory was to be standardized.

4. Preference index, discriminating index and chi-square values were to be calculated. The pairs of items were to be formed on the basis of equal preference values, and different discriminating index. The pairs were to
assembled into the inventory.

5. The final form was to be administered to a large sample of the population.

6. The reliability, validity and norms were to be established.

7. The general evaluation of the inventory was to be made by considering the indices of validity, reliability, the distribution of scores and other observations.

The present work is based on this technique. Therefore, it is necessary to discuss these points in details.

VII PLANNING AND PREPARATION OF THE INVENTORY

A successful inventory can be constructed only when the writer of the inventory is clear about what he seeks to measure. To consider this question some criteria should always be kept in view. This requires a careful and schematic planning of the inventory throughout its construction. Careful planning should precede the actual process of constructing a tool. Planned procedures for tool construction vary depending upon a large number of factors such as the nature of the tool, the type of ability measured and the purpose of the tool, etc. Planning is an essential activity in all stages of a tool construction project. Lack of proper planning may lead to countless difficulties at all stages afterwards. As K.W. Vaughn aptly puts it:

Test planning covers all of the many and varied operations that go into the preparation of an outline or
table specifying the content of operations to be covered by the test, but it must also involve careful attention to item difficulty, to types of items, to directions to the examiner, to arrangements for try-out, to problems of test reproduction, to provision for expert review, to the provision of adequate equipment and facilities, to the procurement of personnel, and so forth. A short orientation to a number of problems, is given here and in the later chapters these points are more elaborately discussed. The process of coordination of various operations involved in the procedure would then be more efficient and smooth and the administration of the project as a whole would be more successful, if some of the difficulties are viewed before they occur. Therefore, it was decided to study some of the inventories available.

VIII STUDY OF AVAILABLE INVENTORIES

Good tests do not simply happen as a product of last minute inspiration. Good tests are planned in detail well in advance, and the plan for the test is closely interrelated with the overall goals of the project. This inventory, therefore, is based on a careful and critical study and survey of literature on the measurement of interest. Below is given the list of inventories which the investigator studied:  

2. Occupational Interest Inventory by Lee and Thorpe
3. Strong's Vocational Interest Blank for men
4. Strong's Vocational Interest Blank for Women
5. Brainard Occupational Preference Inventory
6. Thurstone Interest Schedule
7. Guilford-Shneidman - Zimmerman Interest Survey

(a) Choice of the areas of interests

Analytical study of the above inventories and literature was made with a view to finding out the areas of interests, the types of items for different areas and the number of items included in them. An outline of the present inventory was drawn on the basis of this analysis.

Table 5.1
Analysis of some interest inventories for selection of areas of interest

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of the inventory</th>
<th>Areas included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kuder Preference Record, Vocational, Form - C.</td>
<td>Scientific, Social Service, Literary, Mechanical, Clerical, Computational, Persuasive, Artistic, Musical, Outdoor</td>
</tr>
<tr>
<td>No.</td>
<td>Name of the inventory</td>
<td>Areas included</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td>Occupational Interest</td>
<td>Personal-social</td>
</tr>
<tr>
<td></td>
<td>Inventory By Lee and Thorpe</td>
<td>Natural</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Arts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Sciences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business</td>
</tr>
<tr>
<td>3</td>
<td>Strong Vocational Interest</td>
<td>400 items are grouped into eight parts.</td>
</tr>
<tr>
<td></td>
<td>Blanks for Men and Women</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brained Occupational Preference Record</td>
<td>Commercial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administrative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engineering-Mechanical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Art</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clerical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Musical</td>
</tr>
<tr>
<td>5</td>
<td>Thurston Interest Schedule</td>
<td>Physical Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biological Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Computational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Executives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Persuasive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Linguistic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humanitarian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>contd....</td>
</tr>
</tbody>
</table>
Table 5.1 contd...

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of the inventory</th>
<th>Areas included</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Guilford-Shneidman-Zimmerman Interest Survey</td>
<td>Artistic, Musical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Artistic, Linguistic, Scientific, Mechanical, Outdoor, Business, Social Activity, Personal Assistance, Office work</td>
</tr>
</tbody>
</table>

The analysis of the above inventories revealed that different areas of interest were selected for inclusion in each inventory. Despite the differences between different inventories, presently available data indicate that these inventories measure many common elements. The work of these authors presents evidence that interests can be grouped. It was, therefore, decided to include in the present inventory those areas that are more often used as a measure of interest and are grouped accordingly. Table 5.1II presents a logical reconciliation of the groups obtained by the investigator.
Thus it was decided to include eleven areas of interest out of twenty as shown above in the first form of the inventory. At the outset the reader should recognise that Table 5.II does not present all possible groups of interest. Rather it presents only those interest groups which are revealed by a synthesis of the findings from scientific studies in which interests were measured. As research in this field continues, other groups of measurable interests will undoubtedly be identified. An example is the identification of outdoor interests by Kuder, who devised a scale for measuring these interests after the publication of the original inventory which had only seven scales. Primarily

<table>
<thead>
<tr>
<th>Areas</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative</td>
<td>20</td>
</tr>
<tr>
<td>Clerical</td>
<td>22</td>
</tr>
<tr>
<td>Mechanical</td>
<td>27</td>
</tr>
<tr>
<td>Scientific</td>
<td>32</td>
</tr>
<tr>
<td>Persuasive</td>
<td>19</td>
</tr>
<tr>
<td>Social Service</td>
<td>16</td>
</tr>
<tr>
<td>Teaching</td>
<td>20</td>
</tr>
<tr>
<td>Natural &amp; outdoor</td>
<td>35</td>
</tr>
<tr>
<td>Computational</td>
<td>21</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>30</td>
</tr>
<tr>
<td>Literary</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>266</strong></td>
</tr>
</tbody>
</table>
the above list of groups provide a frame of reference for considering interests and presents the knowledge of the basic types of measurable interests which people have.

IX  SAMPLE

Theoretically speaking the test should be administered to all those for whom it is constructed. It is rather too difficult a task, if not impossible, to include each and every student concerned. Sampling, therefore, is by far the shortest way to overcome this difficulty and hence the problem of having an unbiased representative sample.

The inventory was to be standardized for the pupils studying in the S.S.C. class of Gujarat. Therefore, both boys and girls were selected in appropriate proportion. It was also seen that urban and rural parts of the Gujarat State get appropriate representation in the sample.

Adequate sampling thus comprises one of the most important aspects of the construction of an inventory which requires vigilance on the part of a constructor. Even a good inventory consisting of excellent items would make a poor show only because of the defective sampling. The difficulty values, discriminating indices, the validity and reliability coefficient are all dependent upon the characteristics of the sample of examinees tested. The sample of the examinees should be such that it yields maximum information about the population per individual tested.
It was decided to prepare an inventory which does not require more than a school period on the whole. Considering the time that would be required to give directions it was thought of constructing an inventory the actual working of which would not require more than 10 minutes. Such a time limit would facilitate the work of a person who administers an inventory and practically the school routine would not be disturbed to a great extent.

X  THE CONSTRUCTION OF ITEMS

Constructing good test items is a creative art. Construction of each item presents new situations and new problems. We cannot have a science of test construction. Just as there can be no hard and fast rules for writing a good story or a good poem, so there can be no set rules that will guarantee the production of a good test item. An item is best defined as "a single task or question that usually cannot be broken down into smaller units". E. Lindquist defined an item as "A Scoring unit in an exercise".

The items for the present inventory were constructed on the basis of different sources, viz., the existing inventories, consulting the psychological literature on the subject and discussions with persons who had studied these areas for some


purpose, and persons working in these areas consistently for a number of years. Items were also constructed on the basis of descriptions given in the text books. They were combined with those collected from the inventories. These were suitably edited and assembled into an inventory. A few persons working satisfactorily in each area included in the inventory, and some persons working in the field of psychology were chosen for the discussion of the above items and for their suggestions regarding new items. Some of them were locally contacted and a few others were approached with a letter. In the light of these discussions and comments, the items were edited. The general principles mentioned in the next section were also given due consideration in the preparation of the first draft of the inventory.

(a) **Some Principles observed while writing the items**

The problem of exact and unambiguous communication is very important in standardized tests. Words or statements which are confusing, defeat the very purpose of the test and render it invalid and unreliable. It is, therefore, necessary to use the simplest form of expression and clear words. In wording the statements also certain basic principles are worth considering. These are stated below briefly:

1. The language of the statements should be simple and easily understandable.

2. The meaning of each statement should be unambiguous and clear.
3. Long and complex sentences should be avoided if possible.

4. The sequence of statements should be carefully planned.

Keeping in view the above general principles, as many as possible activities, characteristic of the eleven areas to be measured, were collected. Their sources were, as already mentioned, the discussions in the text books, their use in other inventories, discussions and consultation with the psychologists and persons working in these areas for a long time. Most of the items based in the prevalent inventories are based on the descriptions given in the text books and other literature. The only difference is in the form of items. Some use a question form, while others use a statement form in the first person. But the items are mostly common from one inventory to another if they measure identical areas. For the present inventory also items were borrowed from other inventories and changed according to Indian conditions. The form of items adopted was the statement form. The reasons for choosing the statement form is mentioned in the later part of this chapter. All the items were carefully worded in simple language. They were edited and scrutinized again and again with the help of a few colleagues and persons successfully working in these areas, who were asked to go through the items to point out any ambiguity, lack of clarity, disappropriateness of the activity for the area and possibility of misinterpretation which occurred to them. Items were revised in the light of such comments.
(b) **Language of the Inventory**

The language used for the inventory is Gujarati, because the inventory was meant mainly for the S.S.C. class pupils of the Gujarat State. The work was undertaken in the context of the present worker’s own experience in the Educational and Vocational Guidance Centre, Jeevan Bharati, Surat, where he experienced the complete lack of any suitable evaluation tool in this field. The whole planning was done with this need in view. Besides, the theoretical considerations already discussed in the first chapter, this was again the reason for choosing the areas of measurement. Looking to the standard of English, secondary schools of the State where, in most of the schools, English is taught from the VIIIth grade, local regional language had an obvious advantage over the English language.

The students studying in secondary schools are mostly Gujarati. Their mother tongue was more or less the same with a colloquial change in few words or tone of the language. They spoke, wrote and understood primarily the Gujarati language. The medium of instruction also was Gujarati.

All the above considerations lead to the choice of the Gujarati language as the medium of the inventory.

The items consisted of positive statements such as:

- I would like
- to attend the musical evening
- to visit the art gallery in a museum.
People generally make such positive statements about themselves while thinking or talking to others. By putting a question, a doubt is raised in the mind of the subject. He has to think and decide his answer. Whereas in the above manner, he has to recall whether he has thought or talked that way. If the item has not been thought of before, it anyway raises the question as to whether it is interesting or not, liked by him or not. It is because of this reason that positive statements were preferred to the items in the form of questions.

Moreover, in the interest inventories items have no obvious right and wrong answers. Inventories cannot be scored in such a way as to report to the student how many correct answers he gave. Items of this kind are intended to determine how the individual typically behaves. The pupil's own individual feeling about the activity is what is wanted. A frank and sincere response to each item is obviously necessary to serve the purpose of this study.

(c) General Direction

Rapport was established between the subjects and experimenter, in order to minimize the test consciousness.

Administration of the inventory was characterised by some general direction with reference to the inventory. The general direction was mostly in the form of explanation of the purpose and the use of the inventory. The general direction was given with a view to creating in them a sense
of ease and confidence and ensuring a certain level of motivation. It was made very clear that the inventory is exclusively meant for research and there is no other purpose like exposing the subjects to others. After establishing the rapport the inventory was distributed. They were also advised not to hesitate to ask for any clarification, if needed.

There was no problem in creating motivation with the subjects of this age group as it was made very clear that the inventory was given to measure neither knowledge nor ability.

Thus suitable instructions were prepared to explain the subject what he was supposed to do with the inventory. An appeal was prepared to elicit honest and frank replies. Instructions for marking the answers on the inventory itself were given. Examples were included along with the directions to illustrate how to make answers. In summary, adequate care was taken to make the instructions clear and self-explanatory. A sample of the tryout form of the inventory is given in Appendix A.

The items constructed for different areas of interest were assembled together and mixed. To check the vagueness or errors or repetitions, this form was tried out on the group of 100 students of the S.S.C. class taking the sample from four schools of the Kaira District.

Necessary corrections, additions, omissions, and modifications were made at the end of this tryout. The items,
after discussions with experts were finalized. Some items on which the opinions differed were revised before the pilot form of the inventory was prepared. In stat, this was all that was needed for the preparation of the pilot form of the inventory. This pilot form contained, eleven areas of interest. 20 items were keyed to administrative scale, 22 to clerical scale, 27 to mechanical, 32 to scientific, 19 to persuasive, 16 to social service, 20 to teaching, 35 yo natural and outdoor, 21 to computational, 30 to fine arts and 24 to literary scale.

In the first tryout form the answers were to be given in the inventory itself. No separate answersheet was prepared. Against each item number three categories were provided for answering: Yes, Indifferent, No. However, in the pilot form the answers were not to be given in the inventory itself. A separate answer-sheet was prepared for this. Against each item all the three categories as in the tryout form were provided. The identifying data regarding the individual was also included in the answer-sheet.

The samples of the pilot form of the inventory, and the answer sheet, are appended at the end (Appendix B, C).

**RESUME**

Forced-choice technique is a new innovation in the technique of ratings. As applied to interest inventories, it reduces chances of the faking behaviour by the subjects. It
is based on a key principle of controlling the social desirability factor in the responses to individual items. Generally the subject has to choose one of the two items as more applicable or more favourable to his own behaviour. Those items are matched for their preference index or the social desirability value. Moreover one of the two items has a high discriminative value, while the other has a low one.

The present work is based on this technique, and the steps in the standardization procedure were planned along the requirements of this technique.

There were certain difficulties in the task of measuring interest by way of lack of clarity in the areas to be measured. Clear definitions of these are the first prerequisite. While collecting items, care should be taken to sample likes or dislikes in a wide variety of activities. The possible sources of items are the discussions of the areas to be measured in the text-books and other literature, discussions with the experts, and the items already used in other inventories while measuring the similar areas of interest, and consultations with persons working in these areas for a long time. Utmost care is necessary in the wording of the questions to avoid any ambiguity or lack of clarity. The Gujarati language was used in this particular instance to make the inventory suitable to the local population students who understood the local regional language better than English. The form of the item chosen was the statement form. Carefully edited and scrutinized items were
assembled into the inventory. Instructions to the subject were also prepared. Thus the pilot form of the inventory and a separate answersheet were made ready for pilot administration.


