UNIT 6  ATTITUDE MEASUREMENT AND SCALES

Objectives

After reading this unit, you should be able to :

• describe the type of managerial research problems which utilise the tools of attitude measurement;
• discuss the type of issues which come up when one attempts the measurement of attitudes;
• explain the different attitude measurement scales, along with their strengths and limitations;
• decide for which type of research problems one should go in for specific scale or think of using multidimensional scaling.

Structure

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6.2 Attitudes, Attributes and Beliefs
6.3 Issues in Attitude Measurement
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6.5 Deterministic Attitude Measurement Models: The Guttman Scale
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6.1 INTRODUCTION

There are a number of management decisions which are taken in an organisation, from time to time. The decisions may relate to the acquisition or disposal of materials/machines, manufacturing or marketing of products, hiring or firing of employees, opening or closedown of plants, promotion or reversion of personnel, and so on. Some of these decisions may rely on data for which the units of measurement are capable of statistical manipulation. Such data largely refer to quantifiable parameters or numerical properties of a given population. However, there are illustrations of other decisions which may rely primarily on behavioural data or data which is statistically not manipulatable, in the strict sense of the word. The units of measurement of such data are not interchangeable and are not susceptible to rigorous statistical analysis. The major area of utilisation of such data lies in the discipline of marketing where the manager is interested in knowing the attitudes of the current and potential users of his/her product or service towards his/her product or service concept or idea. This knowledge of attitudes could result in decisions which would be sensible and effective. Some illustrations of managerial decisions which rely on attitude measurement are product positioning and market segmentation, advertising message decisions etc.

6.2 ATTITUDES, ATTRIBUTES AND BELIEFS

Before one plunges into the topic of attitude measurement, it will be worthwhile to understand the key terms which figure repeatedly in this topic.
Each object/product/service is believed to be composed of certain characteristics which fulfil certain needs of its user. These needs may be of psychological, physical or social nature. The characteristics of the object under consideration are called its attributes. The term belief refers to judgements made by a user regarding the object possessing certain attributes or not. Finally, the term attitude refers to the predisposition/mental state of individuals/users towards a product/idea/attributes of an object. It also implies the mental readiness to act in a particular manner and influences the individuals's behaviour towards the object/group/organization/person under consideration. The salient factors that go into the building of the overall attitude of the individual towards the object are a) his/her beliefs about the attributes possessed by the object, b) his/her preference or otherwise for those attributes, and c) the relative importance of each attribute to the individual's decision making process.

6.3 ISSUES IN ATTITUDE MEASUREMENT

Measurement implies the process of obtaining information which can be subject to analysis. Attitude measurement relates to the process of measuring an individual's attitude towards an object. When we go for measurement of attitudes or any other parameter, one has to clearly sort out the following:

- "what" has to be measured?
- "who" is to be measured?
- the accuracy desired in the measurement
- the costs permissible
- the choices available in the measurement/data collection techniques.

In attitude measurement, the researcher is primarily interested in measuring the "state of mind" of the respondent(s). It may include factors such as awareness, attitudes and decision processes. An interesting characteristics of these measures is that their verification is rather difficult. There is no way to determine whether the answer given by a respondent to the level of liking for a new product, such as ice-cream mix, represents the "truth" or not. The researcher, unless he is a "telepathist", cannot actually observe the states of mind like preference, likes and dislikes, etc. Such things can only be inferred.

It has been stated in the previous section, that attitudes are affected by attributes and beliefs. So, the first step, before embarking on an attitude-measurement exercise, is selecting the relevant attributes of the object under investigation. For instance, the salient attributes of a product like "Shrikhand" may be price, shelf life, flavour, and pack size. For a public distribution system they may be quality of grains, prices, outlet working timings, and assurance of availability. It is clearly impossible to measure every attribute of the process/object under consideration. The researcher should settle for the relevant ones only. It is advisable to measure only those attributes which can be related to actions by the respondents. Exploratory research can be helpful in identifying attributes. The methods used could include nondisguised ones like depth interviews and disguised ones like projective techniques. The depth interviews are the most commonly used technique. They use no structured framework for gathering information. The respondents are encouraged to talk about the object under investigation and the investigator tries to uncover its salient attributes in this process. This procedure requires skilled investigators. It is also considered costly and the results are prone to bias errors. The projective techniques attempt to uncover the information from the respondent in an indirect manner. The subject is requested to respond to incomplete stimuli here. In doing so, he/she is believed to reveal elements of attitude towards the object that will not be revealed in response to direct queries. The projective techniques used may include a cartoon test, word association test, sentence completion test, etc. Though these techniques also have some disadvantages, they are used more than the nondisguised methods.

The next important issue in attitude measurement is that "who" is to be measured. It involves people. The question to be posed now is of what kind? Their education, age, sex, occupation, religion etc. may have a bearing on the choice of the measurement method. The measurement procedure must be designed with the characteristics of the respondents under consideration. For instance, using a mail questionnaire for disinterested or hostile respondents would hardly be the right choice as a research instrument.
The third major issue in attitude measurement is the choices in data collection and measurement techniques. The data collection techniques can be categorised into (a) Questionnaire methods, and (b) Observational methods. Usually questionnaires are used for measuring the attitudes.

The approaches for measuring attitudes are as follows:
1) Self-report inventories
2) Using psychological measures like galvanic skin response or pupillary response
3) Projective techniques like thematic a perception test.

The self-report inventories, also known as attitude scales, involve presenting the subjects with a list containing favourable and unfavourable statements about the research topic and ask whether they agree or disagree with each of them.

Most attitude measurement methods use the self-report technique. However they differ in terms of the way the scales are constructed and used.

The weaknesses of the self-report measures are that:
1) The results are limited to what the individuals know about their attitudes and are willing to relate,
2) The validity of the verbalised attitudes is questionable.

We will be discussing some of these scales, along with their characteristics, in the subsequent sections of this unit.

Finally, the last major issue for a managerial researcher here relates to the costs and accuracy desired in the measurement. As has been stated earlier, these type of measurements are never entirely free of inaccuracy. Moreover, cost and accuracy are generally reciprocal properties in measurement. The intimate knowledge of a research instrument can go a long way in the correct interpretation of the results.

Activity 1
List out the salient attributes of the following products.

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Product</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Toilet Soap</td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td>2)</td>
<td>Toothpaste</td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td>3)</td>
<td>Briefcase</td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td>4)</td>
<td>Colour TV</td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td></td>
<td>..........................................................</td>
</tr>
</tbody>
</table>
Activity 2
You may conduct depth interviews to identify attributes of the products mentioned in Activity 1. Compare it with the one you have already listed out in Activity 1.

Activity 3
List out the three important issues in attitude measurement.

6.4 SCALING OF ATTITUDES

Researchers in management have dipped into the bag of tricks of sociologists and psychologists to develop the techniques for measurement of attitudes. Basically, what is done here is to confront the respondent with a number of favourable and unfavourable statements about the subject and find out the extent of his/her agreement or disagreement with them. The object here is, to measure people's attitude to ideas, products or service. The scales are usually highly structured. The underlying assumption in attitude scaling is that attitudes determine opinions and decisions about the product/service/idea. To understand the human behaviour, and to influence it in a given direction, it is necessary to understand the opinions and the basic attitudes underlying them.

There are many types of scales and scaling techniques. We have to choose the most appropriate technique to suit the research being done. The statements contained therein have to be prepared in such a way that the answers received can easily be converted into numerical values. The three most commonly used scales are the Nominal scale, the Ordinal scale and the Interval scale. You will note later on that the appropriateness of a statistical method depends upon the type of scale used in data collection.

1) Nominal Scale: The nominal scale simply allows the categorization of responses into a number of mutually exclusive categories. There are no relationships between the categories, implying that there is no ranking or ordering. The typical applications of the nominal scale is in classification of responses by social class, "like" or "dislike", "yes" or "no", sex, and so on. The statistical operation possible for nominally scaled data is counting only.
2) **Ordinal Scale**: The ordinal scale, allows the respondents to rank some alternatives by some common variable. An illustration of this would be the ranking of three brands of pasteurised milk by a group of consumers on the basis of the perceived quality. Here it is feasible for a user of the product to rank the brands from the best to the worst. However the amount of difference between the ranks cannot be found but. It is only possible to compute positional statistical measures like median and. mode for such data.

3) **Interval Scale**: The deficiencies of the nominal and the ordinal scales are taken care of in the interval scale. The scale has an arbitrary zero point with numbers placed at equally appearing intervals. A number of statistical operations including addition, subtraction, and computation of the mean can be done on intervally scaled data.

Mostly the nominal and the ordinal type of scales are used in attitude measurement. However, there are attempts to treat them or convert them into interval scales so as to make the data more amenable to statistical operations. But the reasonability of this assumption should be always tested before making inferences.

Most of the attitude measurement scales used are ordinal in nature, though there is attempt to treat the resulting data as intervally scaled. The simplest possible type of such scale has the respondent classifying the object/issue/product/himself into one among two dichotomous categories. Further refinements may include the provision of additional alternatives denoting the degrees of liking or disliking. These are listed in sequence so that the alternatives form a type of scale. These scales are basically self-report inventories, with a list of favourable and unfavourable statements towards the subject.

The attitude measurement scales can be categorised into those which are unidimensional in nature and those which are multidimensional. The different type of single dimensional attitude measurement scales which are available are graphical and numerical scales, summated scales, paired comparisons, equal-appearing intervals, etc. Some scales of the above-mentioned type will be discussed in the subsequent sections of this unit.

**Activity 4**
Identify the scale to which the following statements/responses belong.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Statement/Response</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Cleaning ability of various floor polish brands</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>The classification of super-markets by “carry our brand” versus “do not carry our brand”</td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td>Awareness of four print advertisement</td>
<td></td>
</tr>
<tr>
<td>4)</td>
<td>Does your car has radial tyres — yes or no?</td>
<td></td>
</tr>
<tr>
<td>5)</td>
<td>The fahrenheit scale for measuring temperature</td>
<td></td>
</tr>
<tr>
<td>6)</td>
<td>Assignment of number of basketball players</td>
<td></td>
</tr>
<tr>
<td>7)</td>
<td>T.V.A looks better than T.V. B</td>
<td></td>
</tr>
</tbody>
</table>

**6.5 DETERMINISTIC ATTITUDE MEASUREMENT MODELS: THE GUTTMAN SCALE**

In the deterministic attitude measurement techniques the underlying assumption is that each statement has a perfect relationship, of one type or another, with the particular dimension of the attitude being investigated. For instance, let us consider a research study where one is interested in investigating a community's attitude to family planning. The items in the questionnaire which relate to this could consist of the following:

<table>
<thead>
<tr>
<th>Statement/Response</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Family planning is the best hope for our country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Family planning would lead to healthier children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) We should all participate in the family planning programme.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Usually a person who answers YES to 1, would have a high probability of answering as YES to the subsequent statements. Any person who does not answer as YES to 1 but does answer as YES to 2 would have a high probability of answering YES to the later items. Any set of items that produces a pattern of responses as we have described here is called a Guttman Scale.

Guttman scale analysis is usually applied to dichotomous data, i.e., data with only two values, YES or NO, 0 or 1, agree or disagree, etc. However, a number of reasons have made the Guttman scale and impractical tool for the measurement of attitudes. First, the construction of the scale requires a lot of time and effort. Secondly, there may be very few items existing that may fit the model. Since such scales seldom have more than eight items, they can make only rather gross distinctions among respondents.

Activity 5
Define Dichotomous data.

Activity 6
Mention two reasons which make Guttman scale an impractical tool for the measurements of attitudes.

6.6 THURSTON'S EQUAL-APPEARING INTERVAL SCALE
In this scale we are interested in scaling respondents and not statements. The first step in the scale construction is to scale the attitude statements along the attitude continuum. This is done by asking some "judges" to evaluate the items along some continuum.

The statements are printed on some cards and the judges are asked to sort the statements into 11 groups. The extreme piles represent the most favourable and the most unfavourable statements. The judges are expected to make the intervals between the groups equal. The mean rating by judges is taken as the scale point for each item. Items which are found to be ambiguous or irrelevant are dropped. The items selected for the final scale are such that (a) each item has a small standard deviation of ratings over judges and (b) the mean ratings spread evenly from one end of the rating continuum to the other. The selected items are listed in a random order to form the final scale.

The administration of the scale for the measurement of the attitude of a respondent needs the latter to mark only the items with which he/she agrees. The score for the respondent then is taken as the scale value of the median item endorsed or the average scale value of the items endorsed. For instance, suppose a respondent agrees with items which have scale values as 9, 10, and 11. This would imply that he has a favourable attitude to the object (assuming that score of 11 implies most positive attitude!).

The Thurstone scales are prepared with an odd number of positions, the usual number being 11. The scale has some drawbacks such as the time requirement being fairly high, the influencing of scale positions by the attitudes of the judges, and no information on the degree or intensity of agreement with the different items.
Activity 7

Construct a Thurstone’s equal-appearing interval scale for a bank interested in knowing about its image in public by developing a number of statements relating to its service, location and timings, etc.

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6.7 THE SEMANTIC DIFFERENTIAL SCALE

The term Semantic differential scale refers to any collection of rating scales anchored by bipolar adjectives. It is a very flexible approach to obtaining measures of attitudes. The object that is rated is called the "concept" and almost anything can be rated including family planning, cosmetics, Shrikhand, political parties, etc.

107nally, a semantic differential scale is based on a seven-point rating scale for each of a number of attributes relating to the research topic. The extreme point represents the bipolar adjectives with the central category representing neutral. In the semantic differential scale only the extremes have names. The in-between categories have either blank spaces or sometimes a number. Some examples of the scale are as follows

Good .......................................................... Bad
Honest .......................................................... Dishonest
Progressive .......................................................... Behind the times

The preparation of a semantic differential scale for a study requires expressing the things that could be used to describe the object, and thus serve as a basis for attitude formation, in terms of positive and negative statements. The negative phrase is sometimes put on the left side of the scale and sometimes on the right. This prevents a respondent with a positive attitude from simply checking either the left or right hand sides without reading the describing words.

The scale can be used for a variety of purposes. It can be used to check whether a respondent has a favourable attitude towards the object, which out of three neighbourhood banks has the most appealing profile for housewives, etc.

It is possible to assign points to individual cells in the scale. Then one could arrive at the scores for comparisons of different objects. The Figure 1 gives an example based on image study of three neighbourhood banks among a sample of 100 housewives.

![Diagram of Semantic Differential Scale](image)

Fig. 1: Average ratings based on consumers attitude towards neighbourhood banks
The study shown in Fig. 1 indicates to a bank manager those aspects in the bank's image which are relatively weak or strong in the eyes of the customers, vis-à-vis what he/she was planning to achieve and how this bank compared the other two neighbourhood banks. The image profiles are based on the scores of each respondent on each dimension and the average total scores for all respondents provides an index of the overall image rating. The maximum score possible for each bank is +21 and minimum possible score is -21. The bank A scored +10, bank B -8, and bank C - 4. These scores are based on each attribute having the same weighting factor of 1. However, in case the researcher wants to weigh the attributes in a different way, it is feasible. This may lead to different image score for the rival banks. For the manager of bank A, we can conclude that the attributes which need immediate attention are service reliability, followed by modernisation and staff attitudes towards the customers.

**Activity 8**

Use semantic differential technique to develop the profile of three talcum powder producing companies in India.

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**6.8 SUMMATIVE MODELS: THE LIKERT SCALE**

The summative models assume that the individual items in the scale are monotonically related to the underlying attributes and a summation of the item scores is related linearly to the attitude. In a summative model, one obtains the total score by adding scores on individual items. For the statements that imply negative attitudes, the scoring is reversed. The scales allow an expression of the intensity of feeling. These scales are also called Likert scales. Here, instead of having just "agree" and "disagree" in the scale, we can have intensities varying from "strongly agree" to "strongly disagree".

The scale construction consists of the following steps:

1. Write a large number of statements that concern the particular attitudinal object being investigated. For instance one may be looking at the role of voluntary agencies in providing health services in rural areas. Most of these statements should either be moderately positive or moderately negative. Neutral items are generally avoided in these scales. The items should be evenly divided between positive and negative statements.

2. Administer the pool of statements on a group of respondents who are similar to the population on whom the scale will be used. For example, if we want to study the attitude of housewives the pool should be administered on a group of housewives with similar background to our final population.

3. Assign scale values to the degrees of agreement or disagreement with each item. The particular values may differ from one researcher to another. Sometimes one may adopt the values 1, 2, 3, 4, 5 and sometimes +2, +1, 0, -1, -2. For negative items the directions should be reversed.

4. Calculate a total attitude score for each respondent using the same scaling procedure. The distribution of total scores is then used to refine the list of items. This step is called item analysis.

5. Item analysis: Analyse the responses and select for the scale those items which most clearly differentiate between the highest and lowest scores. This can be done by dividing the respondents into the high and the low scoring categories. The high scorers can be assumed to be with favourable attitudes and the low scorers can be taken as having the least favourable attitudes. If the statement is a good one, then it is safe to expect that the mean score for the favourable group would be greater than the mean score for the unfavourable group. If the mean scores across the two groups, for an item, are found nearly equal or equal, then that statement can be dropped from the scale. One can take the high group as the top twenty-rave per cent of all total scores and the low group as
the lowest twenty-five per cent. Alternatively we can divide the respondents into quartiles and compute the median score for each item for the highest twenty-five per cent States and the lowest twenty-five per cent of scale scores.

6) The statements remaining in the pruned fast are randomly ordered on the scale form. The positive and negative ones are mixed.

7) The scale is now administered on the respondents who are asked to indicate their degree of agreement with the items. A respondent's total score is generated as the sum of his scores on each statement.

The summated scales have certain advantages. They are easy to construct, are highly reliable, and can be adapted to the measurement of many different kinds of attitudes.

Activity 9

How would you use a Likert scale to ascertain the image of Colgate toothpaste among some consumers?

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6.9 THE Q-SORT TECHNIQUE

The Q-sort technique grew out of a more general methodology for the study of verbalized attitudes, preferences etc. The peculiar characteristic of this methodology is that here it is more important to make comparisons among different responses within respondents than between respondents. Thus it is a comparative rather than an absolute rating method.

In the area of management, the application of Q-sort has come up in marketing research. Here the respondents may be requested to enunciate their images of their ideal brands, specified brands and their current brand. The respondent may be given a large number of statements (50-100) describing the characteristics of a product. For instance for a cosmetic product like shampoo he may be asked to compare alternatives with adjectives like "easy to use", "economical", and "safe for children", with instructions to array them along the continuum "least preferred - the ideal shampoo". Essentially what the respondents have done here is to array the attributes along the scale.

The Q-sort technique is faster and less tedious for subjects than paired comparison measures. It also forces the subject to conform to quotas at each point of the scale so as to yield a normal or quasi-normal distribution.

The utility of Q-sort in marketing research is to derive clusters of individuals who display similar preferences, thus representing unique market segments. The objective of Q-sort, thus, is intensive study of individuals.

6.10 MULTIDIMENSIONAL SCALING

In the attitude measurement scales which have been discussed till now the object is measured against each characteristic, one at a time. The measurement process tells little about the relative importance of different characteristics or how the characteristics relate to each other. When these aspects become important, one takes recourse to multidimensional scaling. It is a term used to describe a group of analytical techniques used to study attitudes, specially those relating to perceptions and preferences. These techniques attempt to identify the object attributes that are important to the respondents and to measure their relative importance. The major application of multidimensional scaling in managerial research comes in marketing research. Some of the uses which have already been illustrated in the literature are as follows:
Advertising: It has been applied here to answer questions such as: Which media should be used for getting the desired reach? If written media is selected then which magazines/newspapers to advertise in?

Market Segmentation Vendor Evaluations

A detailed discussion of Multidimensional Scaling is outside the purview of this unit. Generally the use of this method requires the use of a computer and a number of computer programmes, both on PCs and the larger systems are available. For a detailed discussion on Multidimensional Scaling, please refer Handbook of Marketing Research, Robert Ferber (ed.), pp. 3-44 to 3-61.

6.11 SELECTION OF AN APPROPRIATE ATTITUDE MEASUREMENT SCALE

We have examined in the earlier sections a number of different techniques which are available for the measurement of attitudes. Each has some strengths and some weaknesses. Almost every technique can be used for the measurement of any component of attitudes. But at the same time all techniques are not suitable for all purposes. Then selection of the scale depends on the stage and the size of the research project. The costs of developing and implementing the instrument, reliability and validity of the instrument and the statistical analysis necessary.

Generally, Thurstone's scale, Q-sort and the Semantic differential scale are preferred for preliminary investigation. The Likert scale is used for item analysis. For specific attributes the semantic differential scale is very appropriate.

Overall the semantic differential is simple in concept and results obtained are comparable with more complex, one dimensional methods. Hence, it is widely used.

6.12 LIMITATIONS OF ATTITUDE MEASUREMENT SCALES

The main limitation of these tools is the emphasis on describing attitudes rather than predicting behaviour. This is primarily because of a lack of models that describe the role of attitudes in behaviour.

6.13 SUMMARY

We have briefly examined the role of attitude measurement and scales in managerial research. We started by looking at the type of managerial decisions which need quantification of attitudinal data. Subsequently, we defined some key terms such as attributes, beliefs and attitudes. This was followed by a discussion on the critical issues in attitude measurement. Then the different types of scales, viz., nominal, ordinal, and interval, which feature in this field, were described. This was followed by five important tools/scales of attitude measurement, viz., Guttman, Thurstone's equal-appearing interval, Semantic Differential, Likert's and the Q-sort technique. Simultaneously, the steps in scale construction and their use were also highlighted. A brief discussion of multidimensional scaling followed. Finally, the issues of the selection of an appropriate attitude measurement scale and the limitations of these research tools were discussed.

6.14 KEY WORDS

Attributes: Characteristics of the object, tinder investigation.

Beliefs: Judgements made by a user regarding the object possessing certain attributes or not.

Attitude: Predisposition of individuals) towards the attributes of an object.

Measurement: The process of obtaining information, which can be subjected to analysis.
Scale: A collection of statements which can be used for measuring attitudes.

Respondent/Subject: Person on whom an attitude measurement scale is administered.

Bipolar adjectives: A pair of words which have opposite meanings.

### 6.15 SELF-ASSESSMENT EXERCISES

1) What do you understand by the terms attitude and attitude measurement? Explain.

2) Which type of managerial research and decisions utilise attitude measurement? Explain with examples.

3) Review briefly the different types of issues in attitude measurement.

4) Compare and contrast the various attitude measurement techniques. When will you use each of them? Discuss briefly.

5) In which type of study will you use multidimensional scaling? Discuss.

### 6.16 FURTHER READINGS


