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Scaling techniques of attitude measurement

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Abstract
The main objective of this research is to analyze the perceived attitude relationships that can be adequately represented and measured by multidimensional models. The particular attitude area selected for this purpose was composed of attitudes and opinions with the methods of quantitative description familiar in science. It is assumed that the researcher who has patiently followed thus far is probably motivated by an interest extending beyond the significance of the data actually presented. Such an interest of the researcher may be either theoretical or practical. It may lie in the direction of the technical problem of attitude measurement as such, or of a wider knowledge of the behavior of consumers. Two aspects have been covered in this study. The one deals with current methods in the quantitative study of attitudes and exhibits the relation of our own techniques to those employed by other investigators. The other will summarize the results of attitude studies and will compare the findings with those of the present investigation. A common feature of market research is the attempt to have respondents by communicating their feelings, attitudes, opinions, and evaluations in some measurable tables. To this end, market researchers have developed a range of scales. Each of these has unique properties. What is important for the market analyst is to realize that they have widely differing measurement properties. Some scales are at very best, limited in their mathematical properties to the extent that they can only establish an association between variables. Other scales have more extensive mathematical properties and some; hold out the possibility of establishing cause and effect relationships between variables. The objective of this research paper is to

- Understand the four levels of measurement that can be taken by researchers
- Distinguish between comparative and non-comparative measurement scales, and
- Formulate a basic tool-kit of scales that can be used for the purposes of market research

Keywords: attitude, scale, measurement, research, consumers, market, intervals, analysis, categories and comparison

Introduction

While conducting research on business-related issues, a researcher has to initially define what is to be measured, how it will be measured and also the concepts that need to be measured. Measurement scales are normally categorized into four types, such as, nominal scale, ordinal scale, interval scale, and ratio scale. The major five criteria for analyzing the effectiveness of measurement are validity, generalizability, sensitivity, reliability, and relevance.

An attitude is a mental state that involves, feelings, values, believes and dispositions to act in a certain way. There are three components of attitude - cognitive component, affective component and behavioral component. Scaling can be defined as the process of measuring the quantitative aspects of subjective or abstract concepts. There are two major types of scales that are used to measure the attitudes of respondents - single item scales and multi-item scales. A sample is the segment of the population that is selected for investigation. Researchers can use probability or non-probability methods for sampling. Probability sampling involves random selection in order to ensure that each unit in the population has a known chance of being selected into the sample. In non-probability sampling the units in the population have an unequal chance of being selected into the sample. Probability methods include simple random, systematic, stratified random, and cluster sampling. Non-probability sampling includes convenient, quota, judgment, and snowball sampling techniques. The steps involved in the process of sampling are - defining the target population, specifying the sampling unit, selection of the sampling method, determination of sample size, specifying the sampling plan, and executing the sampling plan.

Although sampling provides a fair idea of the characteristics of the entire population, it suffers from certain. In general, researchers face two errors - random sampling errors and non-sampling errors. Random sampling error is the difference between the sample results and the results of a census conducted by identical procedures. Non-sampling errors are the errors caused by factors other than sampling and include non-observation errors and measurement errors.

Different Methods of Attitude Measurement for Market Research

Attitudes are individual mental processes which determine both the actual and potential response of each person in a social world. An attitude is always directed towards some object and therefore, attitude is the state of mind of the individual towards a value. Attitude Scales - Rating Scales are used to measure data. Scaling techniques are used to measure different psychological aspects such as attitude, perception and preferences of the people with the help of certain pre-defined set of stimuli and instructions. The stimuli may be certain brands of a product.

Levels of Measurement

Four levels of measurement are: nominal, ordinal, interval and ratio. They consist of a hierarchy where the lowest scale of

measurement, nominal, has far fewer mathematical properties than those with further hierarchies of scales. Nominal scales yield data on categories; ordinal scales give sequences; interval scales begin to reveal the magnitude between points on the scale and ratio scales explain both order and the absolute distance between any two points on the scale.

Most frequently used Scales

- Nominal Scale
- Ordinal Scale
- Interval Scale
- Ratio Scale

There are four types of scales that are generally used for market research.

Nominal Scale

It is a very simple scale. It consists of assignment of facts/choices to various alternative categories which are usually exhaustive as well as mutually exclusive. These scales are just numerical and are least restrictive to all other scales. Examples of Nominal Scale are - credit card numbers, bank account numbers, employee id numbers etc. It is simple and have been widely used to study the relationship between two variables. In a Nominal Scale the numbers are no more than labels and are used specifically to identify different categories of responses. Following example illustrates -

What is your gender?
[ ] Male
[ ] Female

Another example is - a survey of retail stores done on two dimensions - way of maintaining inventories and monthly turnover.

How do you maintain the inventory at present?
[ ] By product category
[ ] At a centralized store
[ ] Department wise
[ ] Single warehouse

Monthly turnover of consumer is?
[ ] Between 1000 – 2000
[ ] Between 2000 – 3000
[ ] Above 3000

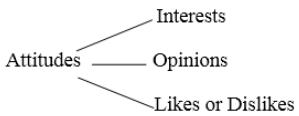
Table 1: A two way classification can be made as follows

Monthly/Inventory Turnover Method	Product Category	Department wise	Centralized Store	Single Warehouse
1000 – 2000				
2000 – 3000				
Above 3000				

Mode is commonly used for response category.

Ordinal Scale

Ordinal scales are the simplest attitude measuring scale used in market research. It is more powerful than a nominal scale in that the numbers possess the property of rank order. The ranking of certain product attributes/benefits as deemed important by the respondents is obtained through the scale.



Example 1: Rating of the following characteristics (1 - 5), on their importance in a Refrigerator.

- Company Name
- Functions
- Features
- Design
- Price

The most important characteristic is rated as 1 by the respondents and the least important is rated as 5. Instead of just numbers, rating can be done through letters and symbols also in an ordinal scale. This scale makes no attempt to measure the degree of preference of different ratings.

Example 2 - If there are 4 different types of detergent powders and if they are rated on the basis of quality as Grade A, Grade B, Grade C and Grade D it is also an Ordinal Scale.

Example 3 - If there are 5 different brands of soaps and if a respondent ranks them based on say, "Fragrance" into Rank 1 having maximum Fragrance, Rank 2 the second maximum Freshness, and so on, a result of Ordinal Scale .

Median and Mode are also useful for ordinal scale.

Interval Scale

Herein the distance between the various categories unlike in Nominal, or Ordinal, are equal in case of Interval Scales. The Interval Scales are also termed as Rating Scales. An Interval Scale has an arbitrary Zero point with further numbers placed at equal intervals. A very good example of Interval Scale is a Thermometer.

Illustration 1 - How do you rate your present microwave oven for the following qualities?

Table 2

Company Name	Less Popular	1	2	3	4	5	Most Popular
Functions	Few	1	2	3	4	5	Many
Price	Low	1	2	3	4	5	High
Design	Poor	1	2	3	4	5	Good
Overall Utility	Low Utility	1	2	3	4	5	High Utility

Such a scale permits the researcher to say that position 5 on the scale is above position 4 and also the distance from 5 to 4 is same as distance from 4 to 3. Such a scale however does not permit conclusion that position 4 is twice as strong as position 2 because no zero position has been established. The data obtained from the Interval Scale can be used to calculate the

Mean scores of each attributes over all respondents.

Ratio Scale

Ratio Scales are not commonly used in market research unless a base item is made available for comparison. In the above example of Interval scale, a score of 4 in one quality does not necessarily mean that the respondent is twice more satisfied than the respondent who marks 2 on the scale. A ratio scale has a natural zero point and further numbers are placed at equally appearing intervals. For example scales for measuring physical quantities like - length, weight, etc.

The ratio scales are very common in physical scenarios. Quantified responses forming a ratio scale analytically are the most versatile. Ratio scale possesses all the characteristics of an internal scale, and the ratios of the numbers on these scales have meaningful interpretations. Data on certain demographic or descriptive attributes, if they are obtained through open-ended questions, will also have ratio-scale properties. Consider the following questions:

Q 1) what is your gross income before taxes? _____ Rs

Q 2) How far is the school from your home? _____ Km

Answers to these questions have a natural, unambiguous starting point, namely zero. Since starting point is not chosen arbitrarily, computing and interpreting ratio makes sense. For example we can say that a respondent with a gross income of Rs 80,000 earns twice as much as one with an annual income of Rs 40,000. In other words, an answer on a ratio scale is a number in the fullest sense of the word, be it discrete or continuous. Consider the following constant-sum scale:

100 points distributed in a way that best reflects the consumer's preference for the following brands:

Bata	85	40	5
Liberty	10	25	10
Woodland	2	15	5
Reebok	3	20	80

Comparison between consumer's preferences

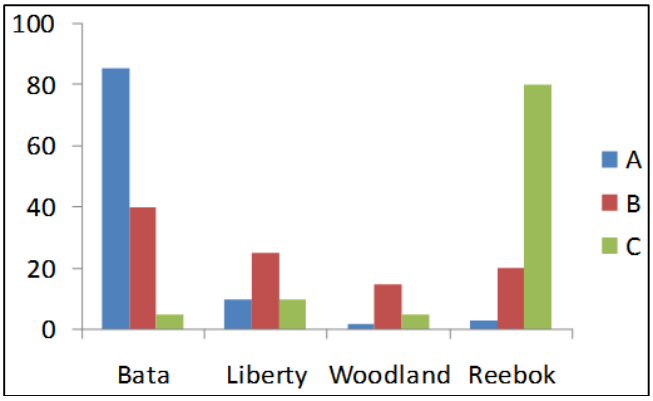


Fig 1

Here the bar diagram focuses on comparing three consumers, A, B and C. As can be seen, B's distribution is more disperse, whereas A and C's preferences are quite skewed towards one brand. B may in this case be a switcher but A and C are brand loyal. However most statistical analyses can be performed through ratio data.

Table 3: Facts about the Four Levels of Scales

Level	Examples	Numerical Operations	Descriptive Statistics
Nominal	Yes-No Female-Male Buy-Did Not Buy Postal Code	Counting	Frequencies Mode
Ordinal	Rankings choose from the following: ▪ Dissatisfied ▪ Satisfied ▪ Highly Satisfied ▪ Delighted Indicate your Level of Education ▪ 10+2 ▪ Diploma ▪ Graduation ▪ Post-Graduation	Counting and Ordering	Frequencies Mode Median Range
Interval	100-Points Job Performance Ratings Assigned by Supervisors: 0%= Worst Performance 100%= Best Performance Temperature Type Attitude Scales: Low Temperature= Bad Attitude High Temperature= Good Attitude	Common Arithmetic Operations	Mean Median Variance Standard Deviation
Ratio	Amount Purchased Salesperson Sales Volume Likelihood of performing some act: ▪ 0%= No Likelihood to ▪ 100%=Certainty Number of stores visited Time spent viewing a particular web page Number of web pages viewed	All Arithmetic Operations	Mean Median Variance Standard Deviation

Scaling Techniques for Measuring Data Gathered from Respondents

The term scaling is applied to the attempts to measure the attitude objectively. Attitude is based on number of external and internal factors. Depending upon the attitude to be measured, appropriate scales are designed. Scaling is a technique used for measuring qualitative responses of respondents such as those related to their feelings, perception, likes, dislikes, interests and preferences.

Types of Scales

The various types of scales used in market research fall into two broad categories: Comparative and Non comparative. Comparative scales involve the respondent in signaling where there is a difference between two or more producers, services, brands or other stimuli. Examples of such scales include; paired comparison, dollar metric, unity-sum-gain and line marking scales. In comparative scaling, the respondent is asked to compare one brand or product against another.

Non-comparative scales, described in the textbook, are; continuous rating scales, itemized rating scales, semantic differential scales and Likert scales. With non-comparative scaling respondents need only the evaluation of a single product or brand. Their evaluation is independent of the other products and/or brands which the market researcher is studying.

Non-comparative scaling is frequently referred to as monadic scaling and this is the more widely used type of scale in commercial market research studies.

Comparative Scales

Paired Comparison: In some cases-the market researchers want to find out the most important factors in determining the demand for a product. Conversely they may wish to know which is the most important factor to prevent the widespread adoption of a product. Take, for example, the very poor farmer response to the first design of an animal-drawn mould board plough. A combination of exploratory research and shrewd observation suggested that the following factors played a role in the shaping of the attitudes of those farmers who feel negatively towards the design:

- Does not ridge
- Does not work for inter-cropping
- Far too expensive
- New technology too risky
- Too difficult to use.

Suppose the organization responsible wants to know which factors are more in consideration in the farmer's mind. It may well be the case that if those factors that are most important to the farmer than the others, being of a relatively minor nature, will cease to prevent widespread adoption. The alternatives are to abandon the product's re-development or to completely re-design it which is not only expensive and time-consuming, but also be subject to a new set of objections.

The process of rank ordering the objections from most to least important is best approached through the questioning technique known as 'paired comparison'. Each of the objections is paired by the researcher so that with 5 factors, as in this example, there are 10 pairs-

$$\text{i.e } \frac{n(n-1)}{2}, \frac{5(5-1)}{2} = 10 \text{pairs}$$

In 'paired comparisons' every factor has to be paired with every other factor in turn. However, only one pair is ever put to the farmer at any one time. The question might be put as follows:

Which of the following was the most important factor in making the farmer decide not to buy the plough?

The plough was too expensive
It is difficult to transport

In most cases the question, and the alternatives, would be put to the farmer verbally. He/she then indicates which of the two was the more important and the researcher ticks the box on his questionnaire. The question is repeated with a second set of factors and the appropriate box ticked again. This process continues until all possible combinations are exhausted, in this case 10 pairs. It is a good practice to mix the pairs of factors so that there is no systematic bias. The researcher should try to ensure that any particular factor is sometimes the first of the pair to be mentioned and sometimes the second. The researcher would never, for example, take the first factor (on this occasion 'Does not ridge') and systematically compare it to each of the others in succession. That is likely to cause systematic bias.

Below labels have been given to the factors so that the worked example will be easier to understand. The letters A - E have been allocated as follows:

A =	Does not ridge
B =	Far too expensive
C =	New technology too risky
D =	Does not work for inter-cropping
E =	Too difficult to use.

The data is then arranged into a matrix. Assume that 100 farmers have been interviewed and their responses are arranged in the grid below. Further assume that the matrix is so arranged that we read from top to side. This means, for example, that 64 out of 100 farmers said the fact that the plough was too expensive was a greater deterrent than the fact that it was not capable of ridging. Similarly, 74 farmers said that the plough's inability to inter-crop was more important than the inability to ridge when deciding not to buy the plough.

Table 4: A preference matrix

	A	B	C	D	E
A	100	64	20	74	80
B	36	100	60	76	66
C	80	40	100	68	24
D	26	24	32	100	92
E	20	34	76	98	100

If the grid is carefully read, it can be seen that the rank order of the factors is as follows:

Most important	E	Too difficult to use
	D	Does not inter crop
	C	New technology/high risk
	B	Too expensive
Least important	A	Does not ridge.

It can be seen that it is more important for designers to concentrate on improving transportability and, if possible, to give it an inter-cropping capability rather than focusing on its

ridging capabilities (remember that the example is entirely hypothetical).

One major advantage to this type of questioning is that whilst it is possible to obtain a measure of the order of importance of five or more factors from the respondent, he is never asked to think about more than two factors at any one time. This is especially useful when dealing with illiterate farmers. That's why it is said that, the researcher has to be careful not to present too many pairs of factors to the farmer during the interview. If he does, he will find that the farmer should quickly get tired and/or bored. It is as well to remember the formula of n (n - 1)/2. For ten factors, brands or product attributes this would give 45 pairs. Clearly the farmer should not be asked to subject himself to having the same question put to him 45 times. For practical purposes, six factors is possibly the limit, giving 15 pairs.

It should be clear from the procedures described in these notes that the paired comparison scale gives ordinal data.

Dollar Metric Comparisons

This type of scale is an extension of the paired comparison method in that it requires respondents to indicate both their preference and how much they are willing to pay for their preference. This scaling technique gives the market researcher an interval - scaled measurement. An example of a dollar metric scale is as follows:

Table 5

Which of the following types of pizza do you prefer?		**How much more, in dollars, would you be prepared to pay for your preferred pizza?**		
Neapolitan Pizza		Neapolitan Pizza		70
Chicago Pizza		Chicago Pizza		50
New York Style Pizza		New York Style Pizza		60
Sicilian Pizza		Sicilian Pizza		70
Greek Pizza		Greek Pizza		20
From the data above the preferences shown below can be determined as given below:				
Neapolitan Pizza	70	+ 70	+ 20	=160
Chicago Pizza	50	+ (20)	+ (50)	=110
New York Style Pizza)	70	+ (30)	+ (50)	=150
Sicilian Pizza	(-60)	+ (-70)	+ (-30)	=(-160)
Greek Pizza	(-20)	+(-50)	+(-30)	=(-100)

The Unity-sum-gain technique

A common problem with launching any new products is to decide as to what options, and how many options one offer. While a company may be anxious to meet the needs of as many market segments as possible, it has to ensure that the segment is large enough to enable him to make a profit. It is always easier to add products to the product line but much more difficult to decide which models should be deleted. One technique for evaluating the options which are likely to prove successful is the unity-sum-gain approach.

The procedure is to begin with a list of features which might possibly be offered as 'options' on the product, and alongside each lists its retail cost. A third column is constructed and this forms an index of the relative prices of each of the items. The table below helps to understand the procedure better. For the purposes of this example the basic reaper is priced at Rs 20,000 and some possible 'extras' are listed along with their prices. The total value of these hypothetical 'extras' is Rs 7,460 but the researcher tells the farmer he has an equally hypothetical Rs 3,960 or similar sum. The important thing is that he should have considerably less hypothetical money to spend than the total value of the alternative product features. In this way the farmer is encouraged to reveal his preferences by allowing researchers to observe how he trades one additional benefit off against another. For example, would he prefer a side rake attachment on a 3 meter head rather than have a transporter trolley on either a standard or 2.5m wide head. The farmer has to be told that any unspent money cannot be retained by him so he should seek the best value-for-money he can get. In cases where the researcher believes that mentioning specific prices might introduce some form of bias into the results, then the index can be used instead. This is constructed by taking the price of each item over the total of Rs 7,460 and multiplying by 100. Survey respondents might then be given a maximum of 60 points and then, as before, are asked how they would spend these 60 points. In this crude example the index numbers are not too easy to work with for most respondents, so one would round them as has been done in the adjusted column. It is the relative and not the absolute value of the items which is important so the precision of the rounding need not overly concern us.

Table 6

Item	**Additional Cost (Rs)**	**Index**	**Adjusted Index**
2.5 wide rather than standard 2m	2,000	27	30
Self lubricating chain rather than belt	200	47	50
Side rake attachment	350	5	10
Polymer heads rather than steel	250	3	5
Double rather than single edged cutters	210	2.5	5
Transporter trolley for reaper attachment	650	9	10
Automatic leveling of table	300	4	5

The unity-sum-gain technique is useful for determining which product features are more important to farmers. The design of the final market version of the product can then reflect the farmers' needs and preferences. Practitioners treat data gathered by this method as ordinal.

Non-comparative Scales

Continuous rating scales

The respondents are asked to give a rating by placing a mark at the appropriate position on a continuous line. The scale can be written on card and shown to the respondent during the interview. Two versions of a continuous rating scale are depicted in below figure:

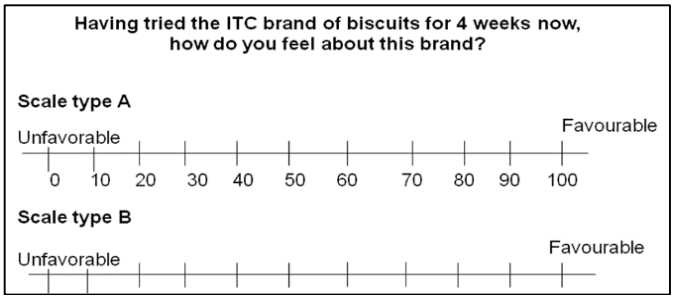


Fig 2

When version B is used, the respondent's score is determined either by dividing the line into as many categories as desired and assigning the respondent a score based on the category into which his/her mark falls, or by measuring the distance, in millimeters or inches, from either end of the scale.

Whichever of these forms of the continuous scale is used, the results are normally analysed as interval scaled.

Graphic Rating Scale

The respondents rate the objects by placing a mark at the appropriate position on a line that runs from one extreme of the criterion variable to another. Example

0 (poor quality)	1 (bad quality)	5 (neither good nor bad)	7 (good quality)

Brand 1

This is also known as continuous rating scale. The customer can occupy any position. Here one attribute is taken ex-quality of any brand of chocolates.

poor	Good

Brand 2

This line can be vertical or horizontal and scale points may be provided. No other indication is there on the continuous scale. A range is provided. To quantify the responses to question that "indicate your overall opinion about ice-ream Brand 2 by placing a tick mark at appropriate position on the line", we measure the physical distance between the left extreme position and the response position on the line.; the greater the distance, the more favorable is the response or attitude towards the brand.

Its limitation is that coding and analysis will require substantial amount of time, since we first have to measure the physical distances on the scale for each respondent.

Itemized Rating Scales

These scales are different from continuous rating scales. They have a number of brief descriptions associated with each category. They are widely used in market research. They essentially take the form of the multiple category questions. The most common are - Likert, Sementic, Staple and Multiple Dimension. Others are - Thurston and Guttman. With an itemised scale, respondents are provided with a scale having numbers and/or brief descriptions associated with each category and are asked to select one of the limited numbers of categories, ordered in terms of scale position that best describes the product, brand, company or product attribute being studied. Examples of the itemised rating scale are illustrated in below figure.

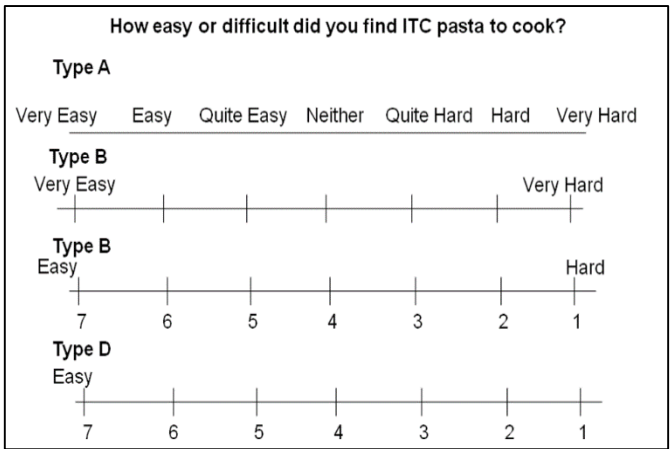


Fig 3

Itemised rating scales can take a variety of innovative forms as demonstrated in the above graph. Whichever form of itemised scale is applied, researchers usually treat the data as interval level.

Line Marking Scale

The line marked scale is typically used to measure perceived similarity differences between products, brands or other objects. Technically, such a scale is a form of what is termed a semantic differential scale since each end of the scale is labeled with a word/phrase (or semantic) that is opposite in meaning to the other. The above figure provides an illustrative example of such a scale.

Consider the products below which can be used when frying food. In the case of each pair, indicate how similar or different they are in the flavour which they impart to the food.

For some types of respondent, the line scale is an easier format because they do not find discrete numbers (e.g. 5, 4, 3, 2, 1) best reflect their attitudes/feelings. The line marking scale is a continuous scale.

Semantic Scale and Semantic Differential Scale

This type of scale makes extensive use of words rather than numbers. Respondents describe their feelings about the products or brands on scales with semantic labels. When bipolar adjectives are used at the end points of the scales, these are termed semantic differential scales. The semantic scale and the semantic differential scale are illustrated in the below figure:

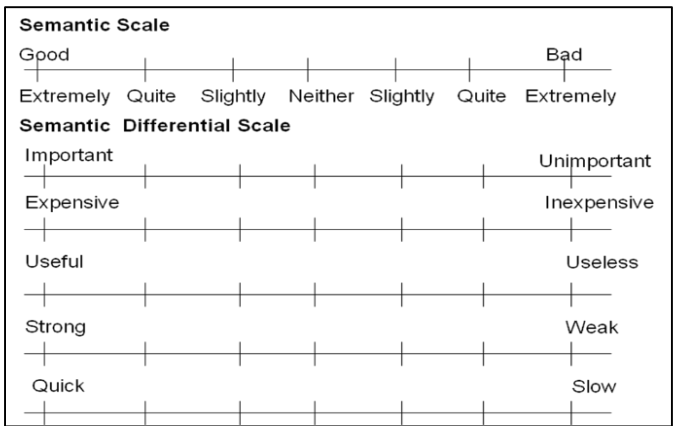


Fig 4

This is a seven point scale and the end points of the scale are associated with bipolar labels.

1	2	3	4	5	6	7
Unpleasant Submissive						Pleasant Dominant

Suppose we want to know personality of a particular person. We have options-

- Unpleasant/Submissive
- Pleasant/Dominant

Bi-polar means two opposite streams. Individual can score between 1 to 7 or -3 to 3. On the basis of these responses profiles are made. We can analyse for two or three products and by joining these profiles we get profile analysis. It could take any shape depending on the number of variables.

Profile Analysis

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Mean and median are used for comparison. This scale helps to determine overall similarities and differences among objects. When Semantic Differential Scale is used to develop an image profile, it provides a good basis for comparing images of two or more items. The big advantage of this scale is its simplicity, while producing results compared with those of the more complex scaling methods. The method is easy and fast to administer, but it is also sensitive to small differences in attitude, highly versatile, reliable and generally valid.

Stapel's Scale

It was developed by Jan Stapel. This scale has some distinctive features:-

- Each item has only one word/phrase indicating the dimension it represents.
- Each item has ten response categories.
- Each item has an even number of categories.
- The response categories have numerical labels but no verbal labels.

For example, in the following items, suppose for quality of ice cream, we ask consumers to rank from +5 to -5. Select a plus number for words which best describe the ice cream accurately. Select a minus number for words you think do not describe the ice cream quality accurately. Thus, we can select any number from +5 to we think are very accurate, to -5 to we think are very inaccurate. This scale is usually presented vertically.

+5
+4
+3
+2
+1
High Quality
-1
-2
-3
-4
-5

This is a unipolar rating scale.

Likert Scales

It was developed by Rensis Likert. It is of ordinal type, they enable one to rank attitudes, but not to measure the difference between attitudes. They take about the same amount of efforts to create as Thurston scale and are considered more discriminating and reliable because of the larger range of responses typically given in Likert scale.

A typical Likert scale has 20 - 30 statements. While designing a good Likert Scale, first a large pool of statements relevant to the measurement of attitude has to be generated and then from the pool statements, the statements which are vague and non-discriminating have to be eliminated.

Here the respondents are asked to indicate a degree of agreement and disagreement with each of a series of statement. Each scale item has 5 response categories ranging from strongly agree and strongly disagree.

5 Strongly agree	4 Agree	3 Indifferent	2 Disagree	1 Strongly disagree

Each statement is assigned a numerical score ranging from 1 to 5. It can also be scaled as -2 to +2.

-2	-1	0	1	2

For example quality of Amul ice-cream is poor then Not Good is a negative statement and Strongly Agree with this means the quality is not good. Each degree of agreement is given a numerical score and the respondents total score is computed by summing these scores. This total score of respondent reveals the particular opinion of a person. Thus, likert scale is a five point scale ranging from 'strongly agreement' to 'strongly disagreement'. No judging gap is involved in this method.

A Likert scale is what is termed a summated instrument scale. This means that the items making up a Likert scale are summed to produce a total score. In fact, a Likert scale is a composite of itemized scales. Typically, each scale item will have 5 categories, with scale values ranging from -2 to +2 with 0 as neutral responses. This explanation may be clearer from the example in the below table:

Table 7

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
If the price of raw materials fell firms would reduce the price of their food products.	1	2	3	4	5
Without government regulation the firms would exploit the consumer.	1	2	3	4	5
Most food companies are so concerned about making profits they do not care about quality.	1	2	3	4	5
The food industry spends a great deal of money making sure that its manufacturing is hygienic.	1	2	3	4	5
Food companies should charge the same price for their products throughout the country	1	2	3	4	5

Likert scales are treated as yielding Interval data by the majority of market researchers. The scales which have been described in this study are among the most commonly used in market research. Whilst there are a great many more forms which scales can take, if students are familiar with those described in this research they will be well equipped to deal with most types of survey problem.

Multi-Dimensional Scaling

This study is based on consumer attitudes related to perceptions and preferences .It consists of a group of analytical techniques which are used to study the major attributes of a class of products perceived by the consumers in considering the products to compare different ranks.

- To find out which brand has more direct competition with each other.
- To study if the consumers would prefer a new brand in the market with a combination of none existing characteristics
- To understand the consumer's ideal combination of product attributes
- To know the relevant sales and advertising messages that are compatible with consumers brand perceptions

It is a computer based technique. The respondents are asked to place the different brands into various categories like very similar, similar, not similar and so on. A goodness of fit is traded off on a large number of attributes. Then a lack of fit index is calculated by computer program. The purpose is to find a reasonably small number of dimensions which will eliminate most of the stress. After the configuration for the consumer's preference has been developed, the next step is to determine the preference with regards to the product under study. These techniques attempt to identify the product attributes that are important to consumers and to measure their relative importance.

This scaling involves an unrealistic assumption that a consumer who compares different brands would perceive the differences on the basis of only one attribute. For example, what are the attributes for joining M.Sc course? The responses may be -to do PG, to go into teaching line, to get knowledge, appearing in the NET. There are a number of attributes; you cannot base decision on one attribute only. Therefore, when the consumers are choosing between brands, they base their decision on various attributes. In practice, the perceptions of the consumers involve different attributes and any one consumer perceives each brand as a composite of a number of different attributes. This is a shortcoming of this scale.

Whenever we choose from a number of alternatives, go for multi- dimensional scaling. There are many possible uses of such scaling like in market segmentation, product life cycle, vendor evaluations and advertising media selection.

The limitation of this scale is that it is difficult to clearly define the concept of similarities and preferences. Further the distances between the items are seen as different.

Thurston Scales

These are also known as equal appearing interval scales. They are used to measure the attitude towards a given concept or construct. For this purpose a large number of statements are collected that relate to the concept or construct being measured. The judges rate these statements along the 11 category scale in which each category expresses a different degree of favorableness towards the concept. The items are then ranked according to the mean or median ratings assigned by the judges and are used to construct questionnaire of twenty to thirty items that are chosen more or less evenly across the range of ratings.

The statements are worded in such a way so that a person can agree or disagree with them. The scale is then administered to assemble the respondents whose scores are determined by computing the mean or median value of the items agreed with. A person who disagrees with all the items has a score of zero. So, the advantage of this scale is that it is an interval measurement scale. But it is the time consuming method and labour intensive. They are commonly used in psychology and education research.

Guttman Scales/Scalogram Analysis

It is based on the idea that items can be arranged in such a way that a person who agrees with an item or finds an item acceptable will also agree with or find acceptable all other items expressing a less extreme position. For example - Children should not be allowed to watch indecent programmers or government should ban these programmes or they are not allowed to air on the television. They all are related to one aspect.

In this scale each score represents a unique set of responses and therefore the total score of every individual is obtained. This scale takes a lot of time and effort in development.

They are very commonly used in political science, anthropology, public opinion, research and psychology.

The Q Sort technique

It is used to discriminate among large number of objects quickly. It uses a rank order procedure and the objects are sorted into piles based on similarity with respect to some criteria. The number of objects to be sorted should be between

60-140 approximately. For example, here we are taking nine brands. On the basis of taste we classify the brands into tasty, moderate and none tasty.
We can classify on the basis of price also-Low, medium, high. Then we can determine the perception of people that whether they prefer low priced brand, high or moderate. We can classify sixty brands or pile it into three piles. So the number of objects is to be placed in three piles-low, medium or high.
Thus, the Q-sort technique is an attempt to classify subjects in terms of their similarity to attribute under study.

Table 8: Summary of Merits and Demerits of Rating Scales

Rating Measure	Subject Must	Merits	Demerits
Category scale	Indicate a response category	Flexible, easy to respond	Items may be ambiguous: with few categories, only gross distinctions can be made
Likert scale	Evaluate statements on a scale of agreement	Easiest scale to construct	Hard to judge what a single score means
Semantic differential and numerical scales	Choose points between bipolar adjectives on relevant dimensions	Easy to construct: norms exist for comparison , such as profile analysis	Bipolar adjectives must be found: data may be ordinal, not interval
Stapel scale	Choose points on a scale with a single adjective in the center	Easier to construct than semantic differential, easy to administer	End points are numerical, not verbal, labels
Constant sum scale	Divide a constant sum among response alternatives	Approximates an interval measure	Difficult for respondents with low education levels
Graphic scale	Choose a point on a continuum	Visual impact, unlimited scale points	No standard answers
Graphic scale with picture response categories	Choose a virtual picture	Visual impact easy for poor readers	Hard to attach a verbal explanation to a response

Areas of Application of Attitude Measurement
An increased attention is being paid to the attitude survey by the marketing researchers. They have been found to be extremely useful in the matters of various marketing problems such as response to an advertisement, price change, product quality, brand loyalty and trade mark etc.

Advantages of Attitude Measurement
- A controlled and planned marketing development needs the knowledge of attitude of consumers. In other words, the knowledge of response mechanism is so essential for successful implementation of the marketing plans.
- The attitude of consumers would aid in successful classification of 'types of consumers'. The basis of grouping is attitude of consumers towards certain product or service.
- Attitude affords predictability which is very much useful to control marketing conditions.
- The study of attitude has a practical importance. A good salesman must be well versed with attitude of consumers, and understands how different types of consumers behave.

Limitations of Attitude Measurement
- The attitude is intangible and not subject to visual observations.
- The consumer attitude is a complex affair due to multiple influences. Hence, we cannot say with certainty how a person will react.
- Measuring attitude lacks proper scale. Market research has no instrument device to measure the attitude correctly.

Conclusion
The attitude researchers have many methods available for assessing the constructs we study and these various techniques all offer useful handles for empirical study. The future of attitude measurement research will no doubt be very interesting, as the relations among implicit measures become better understood as well. in the meantime, we see value in the classic approach to: Any study of a construct are used instead of just one. Only then can issues of construct validity be successfully addressed.
Although implicit measures of attitudes offer great promise, in terms of their ability to assess attitudes freed of participants' self-presentational concerns, at present their claims are validated majorly on intuitive appeals. It is critical for the attitude researchers to establish such in measurement, in fact, to predict the significant criterion of social behaviors.
Additionally as it was claimed in the beginning of this paper, attitude is not a simple production that emerges intact, ripe for measurement. Infact it manifests into many different shapes as a result of complex cognitive process. Our measures need to be sensitive to the ways in which they may be produced. In some situations, assessments of automatically formed evaluations may be most important in predicting behaviors. In other way more deliberative and potentially critically monitored evaluative responses may be what we want to measure. Just because a participant is unaware that his or her attitude is being assessed, that does not mean that the attitude in question has been measured with greater construct validity.
Without doubt both traditional self-report and more indirect attitude measures will continue to be used. The objective is not just to come up with the best attitude measure but to measure different attitudes in all their manifestations and all their complexities.

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