

PART - I: ATTITUDE

INTRODUCTION

One of the most important steps you can take toward achieving your greatest potential in life is to learn to monitor your attitude and its impact on your work performance, relationships and everyone around you.

An attitude is an approach or avenue of life. We have a choice everyday regarding the attitude we embrace for the day. As they say, the only difference between a good day and a bad day is your attitude. We cannot change our past, or change the way certain people think. We cannot change what's predictable. However, the only thing we can change to deal with situations better is our attitude.

Attitude reflects behaviour. One's attitude towards the other determines the other's attitude towards him. If one smiles at the other, the other may smile back; while if one acts hard-nosed with the other, the other is likely to snap at him.

Attitude determines the outcome. This truth is accepted by most of the successful people of the world, whether it is a doctor going for surgery, or a businessman launching a new venture. It is an attitude that provides them the winning edge. Thus, a correct and a willful attitude is the key to success.

The man is the master of his destiny. He can very well manipulate his grief or happiness, by choosing the correct attitude. With a positive outlook, an individual can overcome grief with ease and follow the pursuit of happiness. This can be justified with a famous quote:

"He who has so little knowledge of human nature, has to seek happiness, by changing anything but his disposition, will waste his life in fruitless efforts and multiply the grief he purposes to remove."

Hence, attitude is more important than facts. It is more important than the past than education than money than circumstances than failures than successes or reality.

Attitude is feeling of an individual towards or against something. The things can be a person, object, institution, method, subject, thought, idea, situation, event or any other objects. Psychologists describe attitude as a learned tendency to evaluate things in a certain way. Such evaluations are often positive or negative, but they can also be uncertain at times. For example, you might have mixed feelings about a particular person or issue.

To make a genuine progress in life attitude should be a correct one, friendly, constructive, cheerful, positive and helping others.

Also, attitude is a positive or negative feeling one has towards any psychological object. Attitudes are based upon values and attitude influences our action positively or negatively. Hence they are covert and not overt.

Facts about attitude

- **Attitude** refers to feelings and beliefs of individuals or group of individuals.
- The feelings and beliefs are directing towards other people, objects or ideas. When a person says, "I like my Job." It shows that he has a positive attitude towards his job.
- **Attitude** often results in and affect the behaviour or action of the people. Attitudes can lead to intended behaviour if there are no external interventions.
- **Attitudes** constitute a psychological phenomenon which cannot be directly observed. However, an attitude can be observed indirectly by observing its consequences. For example, if a person is very regular in his job, we may conclude that he likes his job

very much or he is positive towards his job.

- **Attitudes** are gradually acquired over some period. The process of learning attitude starts right from childhood and continues throughout the life of a person. In the beginning, the family members may have a greater impact on the attitude of a child.
- **Attitudes** are evaluative statements, either favourable or unfavourable. When a person says he likes or dislikes something or somebody, an attitude is being expressed.
- All people, irrespective of their status and intelligence have **attitudes**. It helps to define our identity, guide our actions and influence how we judge people.
- An attitude may be unconsciously held. Most of our attitudes may be about those which we are not clearly aware. For example, prejudice.
- **Attitudes** are a complex combination of things we tend to call personality, beliefs, values, behaviors and motivations.
- **Attitude** helps us define how we see situations, as well as define how we behave toward the situation or object.
- Attitude provides us with internal cognitions or beliefs and thoughts about people and objects.
- Attitude cause us to behave in a particular way toward an object or person.

Components of Attitude: Attitude comprise of three basic components: informational, emotional and behavioural. These three components are described below

Informational or Cognitive Component: The informational component consists of beliefs, values, ideas and other information a person has about the object. It makes no difference whether or not

this information is empirically correct or real. For example, a farmer accepting improved variety of crop may learn from his sources and other farmers or his own relatives or another village that the variety's production and other characteristics are very favourable. In reality, it may or may not be correct. The information that farmer is using is the key to his attitude about that improved variety of crops.

Emotional or Affective Component: The informational component sets the stage for the most critical part of an attitude, its affective component. The emotional component involve the person's feeling or affect positive, neutral or negative about an object. This statement can explain this component or "I like this improved variety of the crop as the prospects of this variety is very good."

Behavioural Component: The behavioural component consists of the tendency of a person to behave in a particular manner towards an object. For example, the concerned individual in the above case may decide to adopt the improved variety because of good prospects. Out of the three components of attitudes, only the behavioural component can be directly observed. One cannot see another person's beliefs (the informational component) and his feelings (the emotional component). These two components can only be inferred. However, still understanding these two components is essential in a study of organizational behaviour or the behavioural component of attitudes.

Characteristics of attitude

Attitude can be characterized by

1. **Affective Cognitive Consistency:** The degree of consistency between the affective and cognitive components influences the attitude behavior relationship. That is, the greater the consistency between cognition and evaluation, the greater the strength of the attitude-behavior relation.
2. **Strength:** Attitudes based on direct experience with the object may be held with greater certainty. Certainty is also influenced by whether affect or cognition was involved in the creation of the attitude. Attitudes formed based on affect are more certain than attitudes based on cognition.
3. **Valence:** It refers to the degree or grade of likeness or unlikeness toward the entity/incident. If a person is fairly unconcerned toward an object, then his attitude has low valence.
4. **Direct Experience:** An attitude is a summary of a person's experience; thus, an attitude is grounded in direct experience predicts future behavior more accurately. Moreover, direct experience makes more information available about the object itself.
5. **Multiplicity:** It refers to a number of features creating the attitude. For example, one may show interest in becoming an agricultural scientist, but another not only shows interest but also works hard, is sincere and serious.
6. **Relation to Needs:** Attitude vary in about requirements they serve. Attitude of an individual toward the pictures serve only entertainment needs, but attitudes of an employee toward task may serve strong needs for security, achievement, recognition and satisfaction.

Strength of Attitude

The strength with which an attitude is held is often a good predictor of behavior. The stronger the attitude, the more likely it should affect behavior.

Importance / personal relevance refers to how significant the attitude is for the person and relates to self-interest, social identification and value. If an attitude has a high self-interest for a person (*viz.* it is held by a group the person is a member of or would like to be a member of, and is related to a person's values), it is going to be extremely important.

As a consequence, the attitude shows very strong influence upon a person's behavior. By contrast, an attitude will not be important to a person if it does not relate in any way to his life.

The knowledge aspect of attitude strength covers how much a person knows about the attitude object. People are more knowledgeable about topics that interest them and are likely to hold strong attitudes (positive or negative) as a consequence.

Attitude based on direct experience are more strongly held and influence behavior more than attitudes formed indirectly for example, through hear-say, reading or watching television.

Importance of Attitude

Usually, when education is designed, there are two categories of outcomes in mind: those aimed at cognitive goals and those related to the attitudes of the learner. There is little necessity to argue the importance of the acquisition of knowledge by a student as a result of instruction. Achievement is the paramount objective of most instructional activities; however, it may also be important to recognize the need for establishing attitudinal goals and for planning activities designed to facilitate effective outcomes in learners as a consequence of an instructional situation. In fact, it has become increasingly

noticeable to those involved in educational technology research that one of the major and possibly unique, consequences of instructional situations connecting education is the probability of the development of positive attitudinal positions in learners.

The most influential justification for the need to promote attitude positions in learners would be to express a direct relationship between attitudes and achievement or liking and learning. Several research workers have identified such a relationship. Though, most educational and psychological researchers are hesitant to claim that there is any cause-effect linkage between these two learner variables. There are too many intervening forces likely to influence the relationship between how a person feels and how he or she behaves.

The significance of attitude on learning is only one reason for interest in attitudes. There are other view points that explain why attitude of learners are significant. First, most educationalists would agree that there are time when it is valid and important, for learners to accept the truth of certain ideas in other words, to accept an attitudinal position.

Second, while the power of the relationship between attitudes and achievement is unclear, it seems logical that learners are more likely to remember information, seek new ideas and continue studying when they react favorably to an instructional situation or like a certain content area. Learners, who like chemistry will tend to stay after class to work on experiments, read about chemistry outside of class and be more likely to elect to take a chemistry course than will those who do not like chemistry. Learners tend to do what they like, not what they do not like. They gravitate toward their interests.

Third, there are some examples, when influencing learner's attitudes is not desirable, so educators should be aware of which techniques affect attitudes. In this way, possible bias can be recognized and eliminated. The gender biases found in textbooks are considered partially responsible for gender biases in people. For example, the

use of the generic 'he' was long considered appropriate by textbook authors and publishers. Now it is clear that the use of this term helped form an inappropriate attitude position in both boys and girls that 'males' were more important.

Last, learners' attitudes toward a situation can tell the teacher a great deal about the impact of that situation on the learning process. Obviously, attitudes need to be measured to know if they have been influenced. As a result of quantitatively and qualitatively assessing the opinions of students toward the learning activities in which they are participating, it may be possible to improve the quality of procedures. One of the most important techniques of evaluation is to ascertain attitudes toward some event, object or person. At the end of the course evaluation is done knowing attitude towards course and course content is a standard activities in schools and training centers.

In summing up, attitudes are complex phenomena. They have been studied for decades by social scientists and educators and are beginning to be understood as organizers related to learning processes and outcomes. Attitudes are learned "predispositions to respond" held by individuals that make them likely to act in certain ways. Attitudes are not observable, but they do serve to help construct observable actions in people.

Many social psychologists and others have anticipated some theories of attitude change. Many of the theories are related, so there has been considerable effort to categorize them. Because of the comprehensiveness of the attitude change literature, it is considered important to review the theories of attitude change as a foundation for proposing guidelines for persuasion.

Functions of Attitude

An individual, in his lifetime, is bound to develop some attitudes. These attitudes may be favourable or unfavourable or both. His attitudes colour the personality of a person. Attitudes determine one's personality.

A person can be called good or bad, sociable or unsociable, acceptable or unacceptable depending on his attitude. If a person mostly develops all unfavourable attitudes, his life becomes miserable. He cannot accept or believe or love anybody or anything. He becomes social or antisocial. Conversely, nobody will accept him as this is a reciprocal process.

From the above standpoints, it is well evident that attitude determines one's behaviour, one's personality and one's position in the society. While favourable attitude towards others makes him pleasant, sociable and acceptable, unfavourable attitudes make many enemies and develop hostile feelings and hatred in his mind.

Attitudes have, therefore, significant functions in moulding, influencing and determining one's behaviour in all contexts. As already discussed, by attitude personality can be typed.

Attitudes function as a source of motivation which helps in the adjustment to the environment. There are four different personality functions served by the maintenance and modifications of social attitudes. They are an adjustment, value expression, knowledge and ego-defense.

1. **Adjustment or Utilization Function:** Utilitarian attitudes provide an individual with general tendencies, such as whether to approach or avoid a person, place or thing. The holding of a particular attitude leads to reward or the avoidance of punishment. It is the utilitarian or instrumental function of attitude which motivates the person to adjust to the environment to gain social approval

and the support of family, friends and neighbours. In the case of certain social issues like marriage, death, democracy, religion, sacrifice and helping others, he holds opinions similar to his parents and relations and friends. Further favourable attitudes are developed towards those stimuli which satisfy one's needs and unfavourable attitudes towards those which stand on the fulfillment of his needs and motives.

2. **Value Expression Function:** Value-expressive attitudes express central values or beliefs. By identification with parents and other relatives, the child develops certain personal values and self concepts. These values are integrated into the form of different attitudes. Attitudes help in expressing these values. The individual gets satisfaction by expression of attitudes appropriate to his personal values. Religious, ideological and patriotic beliefs and values normally are based on this function. People get self satisfaction by engaging themselves in social work, care for the aged persons, by helping at the time of flood and famines, by taking care of the orphans or by raising their voice against corruption and social injustice.
3. **Knowledge Function:** Knowledge-related attitudes help individuals to organize and interpret new information. This function of attitude is based on the need to understand, make sense and give adequate structure to the universe. Attitudes have a cognitive function in the sense that they help in understanding things properly for the sake of quick adjustment. Attitudes which prove inadequate dealing with new and changing situations are discarded because, otherwise, they lead to contradictions and inconsistency. The need for cognitive consistency, meaning and clarity is fulfilled by the knowledge function of attitude.
4. **Ego-Defensive Function:** Ego-defensive attitudes help people protect their self-esteem. The ego-defensive function of attitude provides protection against the knowledge and acceptance

of basic unpleasant truths about disease, death, weakness, insecurity, frustration, unemployment, illness and various other harsh realities of life. By rationalizing and distorting attitudes on the above harsh realities of life, the ego tries to defend itself and lead a happy life by avoiding unpleasantness arising out of these unpleasant truths. All these facts lead to believe the tremendous significance of the functions of attitude in human life.

Kinds of Attitude

Attitudes are considered of three types; viz. (1) Positive or Favourable attitude, (2) Negative or Unfavourable attitude and (3) Neutral or Neither favourable nor unfavourable. However, many psychologists explain it in various ways. Here's a list of few of the attitude types that we've put together of what people's actions and perceptions are.

| | | | |
|--------------|--------------|------------------|------------------------|
| Affectionate | Expansive | Mature | Sensitive |
| Acceptance | Freedom | Motivated | Serious |
| Aspiring | Faith | Not jealous | Sincere |
| Ambitious | Flexible | Open minded | Social |
| Candid | Forgiving | Optimistic | Sympathetic |
| Caring | Frugal | Positive | Self-esteem |
| Change | Friendly | Perseverance | Self-giving |
| Cheerful | Focused | Practical | Thoughtful |
| Considerate | Generous | Punctual | Tolerant |
| Cooperative | Gloomy | Responsive | Thoughtful |
| Courageous | Goodwill | Responsible | Trusting |
| Decisive | Grateful | Reliable | Self-reliant |
| Devoted | Hard working | Responsibility | Unpreten- tiousness |
| Determined | Honest | Realistic | Unselfish |
| Distant | Humble | Self-confident | Willingness |
| Embraces | Interested | Self-directed | Work-oriented |
| Endurance | Involved | Self-disciplined | |
| Enthusiastic | Kind | Selfless | |

Summarizing everything said above, what we think, what we do, and what we feel is what forms our attitude. While sometimes knowledge and experience form our attitude, on other occasions it is based on our assumptions and beliefs.

Formation of Attitude:

1. Attitudes are not biologically inherited but built out of continuous experiences of the world around us. They are the outcome of the complex function of both cultural and functional factors. From birth onwards, every individual is exposed to direct and indirect stimuli of the environment which teach him to hold certain ideas, values and beliefs.
2. Through the process of socialization when one is taught to associate good or bad feelings, dos or don'ts, favorable and unfavorable experiences with certain actions or behaviour patterns, he develops certain consistent attitudes. When, some actions are rewarded one develops a favourable attitude towards it and any action or view which is punished one develops an unfavourable attitude towards it.
3. Attitudes also occur when one follows his parents and other closely accustoms or closely familiar with friends and have relationships with others. Children and adults form attitudes very often based on suggestions and second-hand experiences. Many adults are also found forming attitudes spontaneously based on their own personal and first-hand experiences. Nevertheless, attitudes grow in the mind of individual through the process of socialization.
4. Social attitudes develop out of verbal value judgments, dos and don'ts. But personal attitudes may develop out of one's interaction, contact and experience with the attitudinal objects and other objects related to it. In the case of social attitudes, one is taught to hold a particular attitude towards attitudinal objects

like “Experienced farmer says not to adopt a certain technology.

5. Parents, family members, media and press, peers, teachers and well wishers acquaintances, all play a tremendous role in the formation and growth of attitudes.
6. Through attitudinal socialization experiences, people come to learn appropriate attitudes towards certain people, different types of technology, food, toy, playmates, play materials and develop negative attitudes towards others. According to psychologists, our attitudes are centralized in the objects of values which may be social institutions, individuals, neutral objects, parties, etc.
7. The development of values out of which attitudes formed are the outcome of social traditions, customs learning and social institutions. Initially, the infant being only concerned with the satisfaction of his basic needs like food and care is socially blind and is not concerned about the social sanctions.
8. Through the process of need satisfaction an individual gets a scope to develop an attitude. Those objects and persons which satisfy his needs he develops a favourable attitude towards them. But when an object or person stands in the way of his need satisfaction, unfavourable attitude develops towards it.
9. In the routine behaviour individual never shows the matured direction of attitude up to the very early age may be up to the third or fourth year, the attitude in its proper connotation does not appear. But when an individual goes to school and starts keeping contacts with society by any means, certain values and disciplines are imposed upon him and these values gradually become the core of attitude formation. In the beginning, the child’s mental level being less matured, his values are shapeless and the attitude formation is in a completely defused stage. To the

different objects, he will simply say like or dislike, but he cannot discriminate. At this stage, there is no selectivity of perception which is necessary for the formation of attitude. This selectivity of perception and values gradually grow in children out of which attitudes are formed.

10. The differentiation to the different objects or stimuli around an individual grows in the course of years. In the beginning, the child reacts equally say to three different objects, but when differentiation is built up, he becomes sympathetic and protective to the pet or demanding to his mother or appreciates an actor, teacher or leader. These clear-cut differentiations in the course of years indicate that attitude undergoes development in a social context depending upon its existing cultural pattern and social sanctions. After differentiation integration of different value structures and attitudes which encompass them take place.
11. The cognitive clarity is essential to form or give direction to any attitude. Depending upon the value attached to a particular attitudinal object, favourable or unfavourable attitudes develop. As the child or an individual gets maturity by power, prestige, recognition, social approval, rewards and punishment, he gradually attends to the social world.
12. The frame of reference and reference groups often help in supporting or rejecting a particular value, norm or standard. The direction of attitude is based on these. In daily life, many of our attitudes are formed by short-cut values and dictums are coming from other people before we make up our mind through actual contact with the situation, person or object.
13. A standard or norm having an authoritarian source or frame of reference may produce organisation at a higher level. Similarly, a standard carrying with it the sanction of public approval is accepted than when the individual himself evolves the same or a

similar standard.

14. It is also observed that attitudes are formed from radio, news papers and other mass media as well as from norms of the individual membership groups. The cognitive components of the attitude mostly develop out of indirect and second hand information, the communication media. The attitudes may be right or wrong, but undoubtedly the communication network plays a vital role in the formation of attitudes.
15. One's affiliation with the groups helps in the formation of attitude. An individual usually accepts the attitudes developed by such groups, may be his family school, neighbourhood, peer groups, various relations, social and ethnic groups. However, there may be some exception and individual difference depending on the personality of the concerned individual.
16. Personality plays a key role helping in the diversity of attitudes. Many studies indicate how basic personality structure can determine attitudes. Personality characteristics like introversion, extraversion, dominance, submissiveness are related to attitudes like radicalism and conservatism.
17. The role of primary groups such as family, friends and colleagues help in the formation of attitude. Similarity and attraction also help in the formation of attitudes.
18. The attitudes which start growing continuously from childhood may be modified by the time; we are adults, but the process of acquisition and development of attitudes continue.

Measurement of Attitude

The various methods of measuring attitudes have been developed, however possibly the simplest technique of understanding someone's attitudes would be to ask them. The fact is that they may not well say about their true attitudes. Though, attitudes are related to self-image and social acceptance. To preserve a positive self-image, people responses may be affected by social desirability. But they will answer in a way that they feel socially acceptable. Given this problem, However, all of them have limitations. In particular, the different measures focus on different components of attitudes – cognitive, affective and behavioral – and as we know, these components do not necessarily coincide.

The measurement of attitude can be divided into two basic categories viz. Direct Measurement (Likert Scale and Semantic Differential) and Indirect Measurement (Projective Techniques)

1. Direct Measurement

1.1 Likert Scale

Many types of rating scales have been developed to measure attitudes directly. The commonly used method to measure attitude is the Likert Scale. Likert (1932) developed the principle of measuring attitudes by asking people to respond to a series of statements about a topic, regarding the extent to which they agree with them and so tapping into the cognitive and affective components of attitudes. Likert-type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (Bowling, 1995; Burns, & Grove, 1997). These ordinal scale measure levels of agreement/disagreement.

A Likert-type scale assumes that the strength/intensity of the experience is linear, viz. on a continuum from 'Strongly-Agree' to 'Strongly-Disagree' and makes the assumption that attitudes can be

measured. Respondents may be offered a choice of five to seven or even nine pre-coded responses with the neutral point being neither agree nor disagree.

In its final form, the Likert Scale is a five (or seven) point scale which is used to allow the individual to express how much they 'Agree' or 'Disagree' with a particular statement.

For example:

I believe that low income in farming is the key issue Indian people face today.

'Strongly agree' / 'Agree' / 'Don't know' / 'Disagree' / 'Strongly Disagree'

Each of the five (or seven) responses would have a numerical value which would be used to measure the attitude under investigation.

Likert Scale Examples:

1. Agreement point of view: 'Strongly Agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly Disagree'
2. Frequency or regularity point of view: 'Very Frequently', 'Frequently', 'Occasionally', 'Rarely' and 'Never'
3. Importance or Significance point of view: 'Very Important', 'Important', 'Moderately Important', 'of Little Importance' and 'Unimportant'
4. Likelihood or Choice point of view: 'Almost Always True', 'Usually True', 'Occasionally True', 'Usually Not True' and 'Almost Never True'

How to analyze data from a Likert Scale?

1. Summarize using a median or a mode (not a mean); the mode is probably the most suitable for easy interpretation.

2. Display the distribution of observations in a bar chart (it can't be a histogram because the data is not continuous).

Critical Evaluation

Likert Scales have the advantage that they do not expect a simple Yes/No answer or response from the respondent, but rather allow for degrees of belief and even no belief at all. Therefore quantitative data is obtained, which means that the data can be analyzed with relative ease. However, like all surveys, the validity of Likert Scale attitude measurement can be compromised due to social desirability. It means that individuals may lie to put themselves in a positive light. For example, if a Likert scale was measuring discrimination, who would admit to being racist?

Offering anonymity on self-administered questionnaires should further reduce social pressure and thus may likewise reduce social desirability bias. Paulhus (1984) found that more desirable personality characteristics were reported when people were asked to write their names, addresses, and telephone numbers on their questionnaire than when they told not to put identifying information on the questionnaire.

1.2 Semantic Differential

Semantic differential is a type of a rating scale designed to measure the connotative meaning of objects, events, and concepts. The connotations are used to derive the attitude towards the given object, event or concept. In a semantic differential, the scale is a list of opposite adjectives is used. It is a method invented by C.E. Osgood (1957) to measure the connotative meaning of cultural objects. Semantic differential scales are used in a variety of social science research, but it also is used in marketing and practical, user experience research and therapy. Sometimes semantic differentials are also known as Polarities.

Osgood's semantic differential technique of Osgood *et al.* (1957)

is an application to measure the semantics or meaning of words, particularly adjectives and their referent concepts. The respondent is asked to choose where his or her position lies, on a scale between two polar adjectives for example: "Adequate-Inadequate," "Good-Evil" or "Valuable-Worthless". Semantic differentials can be used to measure opinions, attitudes and values on a psychometrically controlled scale. In this technique, a person is asked to rate an issue or topic on a standard set of bipolar adjectives (*viz.* with opposite meanings), each representing a seven-point scale. For example, to measure attitude towards 'car' participants can be given a variety of adjectives to describe a car that helps to measure the attitude of an individual towards it.

In Osgood's original research, factor analysis shows the emergence of three underlying components that have been named (1) Evaluation, (2) Potency and (3) Activity (EPA).

1. Evaluation is concerned with whether a person thinks positively or negatively about the attitude topic. "The Evaluation dimension is tapped by the "good, nice" versus "bad, awful" scale just mentioned.
2. Potency is concerned with how powerful the topic is for the person. This dimension corresponds to a scale that contrasts "powerful, big" with "powerless, little."
3. Activity is concerned with whether the topic is seen as active or passive. A scale for assessing the activity dimension contrasts "fast, noisy, active" with "slow, quiet, inactive." Pan-cultural multivariate analyses have demonstrated that these EPA dimensions are clearly recognizable in multiple cultures and a variety of languages.

Using this information we can see if a persons feeling (evaluation) towards an object is consistent with their behavior. For example, a person might like the taste of chocolate (evaluative) but not eat it often (activity). The evaluation dimension has been mostly used by

social psychologists as a measure of a person's attitude because this dimension reflects the affective aspect of an attitude.

Creating the scale

The scale is set up using polar adjectives (opposite-meaning terms) at each end. After examining the connotative meaning of thousands of concepts, as mentioned earlier Charles Osgood and his associates identified three major dimensions of meaning: strength, value, and activity. The first two examples below fit the theme of value (Evaluation). The second two represent strength (Potency), and the last two illustrate activity.

- Good _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ Bad
- Cheap _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ Expensive
- Strong _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ Weak
- Decisive _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ Indecisive
- Active _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ Passive
- Lazy _7_ : _6_ : _5_ : _4_ : _3_ : _2_ : _1_ Industrious

The respondent is asked to rate an object, person or any concept, by putting a mark on one of the seven spaces along each dimension. The blanks are numbered from 1 to 7 and then the responses are averaged for each dimension. The average is plotted on the form and provides a profile of the connotation of the target concept. Attitude towards two objects can be compared for all the six considerations (as seen in above figure). The selected sample respondents and average scores for all the six considerations can be marked by two different colours may be red and blue and the results can be presented in a figure, or you can list the average scores on each dimension, and then draw conclusions. This way attitude towards two objects can be compared. Attitude towards one object can also be seen in each dimension (viz. good to bad, cheap to expensive and so on).

2. Indirect Methods

2.1 Projective Techniques

To avoid the problem of social desirability, various indirect measures of attitudes have been used. Either people are unaware of what is being measured (which has ethical problems), or they are unable consciously to affect what is being measured.

Indirect methods typically involve the use of a projective test. A projective test involves presenting a person with an ambiguous (viz. unclear) or incomplete stimulus (viz. a picture or words). The stimulus requires interpretation from the person. Therefore, the person's attitude is inferred from their interpretation of the ambiguous or incomplete stimulus.

The assumption about these measures of attitudes is that the person will "project" his or her views, opinions or attitudes into the ambiguous situation, thus revealing the attitudes the person holds. However, indirect methods only provide general information and do not offer a precise measurement of attitude strength since it is qualitative rather than quantitative. This method of attitude measurement is not objective or scientific which is a big criticism. Projective techniques include (1) Thematic Apperception Test (or TAT), (2) Draw a Person Task and (3) House-Tree-Person.

2.2 Thematic Apperception Test

Here a person is presented with an ambiguous picture which they have to interpret. The Thematic Apperception Test (TAT) taps into a person's unconscious mind to reveal the repressed aspects of their personality. Although the picture, illustration, drawing or cartoon that is used must be interesting enough to encourage discussion, it should be vague enough not to give immediately away what the project is about.

TAT can be used in a variety of ways, from eliciting qualities associated with different products to perceptions about the kind of people that might use certain products or services. The person must look at the picture(s) and tell a story. For example: What has led up to the event shown? What is happening at the moment? What the characters are thinking and feeling? and What the outcome of the story was?

2.3 Draw a Person Task

The figure drawings are projective investigative techniques in which individual is initiated to draw a person, an object or a situation so that cognitive, interpersonal or psychological functioning can be judged. The test can be used to evaluate children and adolescents for a variety of purposes (*viz.* self-image, family relationships, cognitive ability and personality).

A projective test is one in which a test taker responds to or provides ambiguous, abstract, or unstructured stimuli, often in the form of pictures or drawings. While other projective tests, such as the Rorschach Technique and Thematic Apperception Test, ask the test taker to interpret existing pictures, figure drawing tests require the test taker to create the pictures themselves. In most cases, figure drawing tests are given to children. Because it is a simple, manageable task that children can relate to and enjoy.

Some figure drawing tests are primarily measures of cognitive abilities or cognitive development. In these tests, there is a consideration of how well a child draws and the content of a child's drawing. In some tests, the child's self-image is considered through the use of the drawings.

In other figure drawing tests, interpersonal relationships are assessed by having the child draw a family or some other situation in which more than one person is present. Some tests are used for the evaluation of child violence. Other tests involve personality interpretation through drawings of objects, such as a tree or a house, as well as people.

Finally, some figure drawing tests are used as part of the diagnostic procedure for specific types of psychological or neuropsychological impairment, such as central nervous system dysfunction or mental retardation.

Despite the flexibility in administration and interpretation of figure drawings, these tests require skilled and trained administrators familiar with both the theory behind the tests and the structure of the tests themselves. Interpretations should be made with caution and the limitations of projective tests should be considered. It is a good idea to use projective tests as part of an overall test battery. There is little professional support needed for the use of figure drawing, so the examples that follow should be interpreted with caution.

2.4 House-Tree-Person (HTP) Test

The House-Tree-Person Test (HTP) is a projective test designed to measure aspects of a person's personality. This test can also be used to assess brain damage and general mental functioning. A test is a diagnostic tool for clinical psychologists, educators, and employers. The subject receives a short, unclear instruction (the stimulus) to draw a house, a tree, and the figure of a person. Once the subject is done, they are asked to describe the pictures that they have done. The assumption is that when the subject is drawing, they are projecting their inner world onto the page. The administrator of the test uses tools and skills that have been established for the purpose of investigating the subject's inner world through the drawings.

This test created by Buck in 1948, provides a measure of a self-perception and attitudes by requiring the test taker to draw a house, a tree, and a person. The picture of the house is supposed to conjure the child's feelings toward his or her family. The picture of the tree is supposed to elicit feelings of strength or weakness. The picture of the person, as with other figure drawing tests, elicits information regarding the child's self-concept. The HTP, though mostly given to children and

adolescents, is appropriate for anyone over the age of three. HTP is given to persons above the age of three and takes approximately 150 minutes to complete based on the subject's level of mental functioning. During the first phase, the test-taker is asked to draw the house, tree, and person and the test-giver asks questions about each picture. There are 60 questions originally designed by Buck, but art therapists and trained test givers can also design their questions, or ask to follow up questions. This phase is done with a crayon. During the second phase of HTP, the test-taker draws the same pictures with a pencil or pen. Again the test-giver asks similar questions about the drawings. **Note:** Some mental health professionals only administer phase one or two and may change the writing instrument as desired. Variations of the test may ask the person to draw one person of each sex or put all drawings on the same page. Examples of follow up questions.

- **After the House:** Who lives here? Is the occupant happy? What goes on inside the house? What's it like at night? Do people visit the house? What else do the people in the house want to add to the drawing?
- **After the Tree:** What kind of tree is this? How old is the tree? What season is it? Has anyone tried to cut it down? What else grows nearby? Who waters this tree? Trees need the sunshine to live so does it get enough sunshine?
- **After the Person is drawn:** Who is the person? How old is the person? What do they like and dislike doing? Has anyone tried to hurt them? Who looks out for them?

Evaluation of Indirect Methods

The major criticism of indirect methods is their lack of objectivity. Such methods are unscientific and do not objectively measure attitudes in the same way as a Likert Scale. There is also the ethical problem of deception as often the person does not know that their attitude is being studied when using indirect methods. The advantages of such

indirect techniques of attitude measurement are that they are less likely to produce socially desirable responses, the person is unlikely to guess what is being measured and behavior should be natural and reliable.

Construction of scale to measure attitude

An attitude is a person's feeling toward any object or event.

Attitudes have two important aspects Direction and Intensity.

(1) Direction: Attitude may be positive or constructive or negative or unconstructive towards any objects. For example, you might like Gir Cows - thus, your attitude towards Gir Cows has a positive direction.

(2) Intensity: Attitudes have the strength of feeling. For example, if you are crazy about Gir Cows, your attitude toward them has a high level of intensity. So considering both the aspects of attitude it can be said that you would be intensely positive toward Gir Cow.

Attitudes are so much a part of human behavior; researchers have spent a great deal of time to figuring out ways to measure attitudes. There are numerous attitude scales.

Scale:

1. The scale is a concept, device or procedure used in arranging, measuring or quantifying events, objects or phenomenon in any sequence.
2. The scale is a device by which we can measure object or variables.
3. The scale is a set of numbers or amounts used to measure or compare the level of something.

Various kinds of scales are used for measuring the physical phenomena, while to measure social phenomena we have some facts known as attributes or variables. Variables are those facts that can be measured directly or for which standard scales have already been provided. For

example, the height or weight of a boy can be directly measured, but some facts are qualitative in nature that cannot be measured directly viz. social status, attitudes of a person. In social phenomena, most of the facts are qualitative in nature and may differ person to person. They hardly give any precise or clear cut idea about the state of affairs.

In social sciences, efforts for quantitative measurement are being tried in the form of various kinds of scales. In fact, social phenomena appear to be complex, intangible and therefore, incapable of numerical expression because of our lack of complete knowledge about it. With the improvement of science, we can able to grade, classify and measure independently.

Scale Product Method to develop scale to measure attitude

Attitude refers to the degree of “positive or negative feelings associated with some psychological objects” (Thurstone, 1946). The “Scale Product Method” is one of the important methods extensively used to develop a scale to measure attitude. This method combines Thurston’s technique (1928) of equal appearing interval scale for selection of items and Likert’s technique (1932) of summated rating for ascertaining the response on the scale as proposed by Eysenck and Crown (1949). The steps to be followed to develop a scale to measure attitude are explained here illustrating an example to develop a scale to measure the attitude of the farmers towards Agricultural Produce Market Committee (APMC) developed by Vinaya and Chauhan (2016).

1. Item selection

The first step in developing scale is selection of statements or items. The items making up an attitude scale are known as statements. A statement may be defined as a sentence that says something about a psychological object. As the first step in developing the scale, 30 statements related to Agricultural Produce Market Committee (APMC) were collected from the relevant literature, discussion with experts, extension educationists and social scientists working in

Anand Agricultural University. These chosen 30 statements were processed for refinement. For this, a separate panel of 20 experts was selected. The experts were requested to give their opinion about the competence of each statement to understand positive or negative feelings of farmers towards APMC. This time judges were requested to give their response regarding their agreement or disagreement about the statements to include in the scale to understand positive or negative feelings of farmers towards APMC rather than giving a response regarding the degree of favorableness or unfavorableness or say attitude towards the APMC. Out of 30 items or statements, 21 statements for which 90 or above 90 per cent of judges showed approval were selected for the next step.

The statements were edited by the following criteria suggested by Thurston and Chave (1928), Wang (1932), Likert (1932) and Edward and Kilpatrick (1948).

1. Avoid statement that refers to the past rather than present.
2. Avoid statements that are factual/ numerical.
3. Avoid statements that can be interpreted more than one way.
4. Avoid statements that are irrelevant to psychological aspect under consideration.
5. Avoid statements that are likely to be endorsed by almost everyone/ almost none.
6. Select statements that are believed in covering the entire range of affective scale of interest.
7. Keep the language of statements simple, clear and direct.
8. The statement should be short rarely exceeding 20 words.
9. Each statement should have only one complete thought.

10. Statements containing universal such as All, Always, None & Never often it reduces ambiguity & it should be avoided.
11. Words such as only just, merely and others of a similar nature should be used with care and moderation in writing statement.
12. The statement should be in the straight forward form.
13. Avoid use of words that may not be understood by those who are to be given the completing scale.
14. Avoid the use of double negatives.

Finally following 21 statements were selected for the subsequent procedure of development of scale to measure attitude of the farmers towards Agricultural Produce Market Committee (APMC).

1. I endorse that APMC is farmers' friendly approach to sale farm products. (+)
2. I think APMC system fails in controlling exploitation of farmers. (-)
3. APMC is proper system to secure farmers exploited by intermediaries. (+)
4. APMC is an inadequate system to help farmers to sale farm products appropriately. (-)
5. APMC serves as a system to stop harsh conditions created by traders for farmers. (+)
6. The payment system of farm produces adopted under APMC is inappropriate. (-)
7. APMC is ultimate solution in offering remunerative prices to the farmers. (+)
8. APMC is not a long-term solution to the problems of price inflation. (-)
9. APMC system brings transparency in the marketing of farm

products. (+)

10. APMC system does not ensure farmers in getting expected returns. (-)
11. APMC ensures effective mode of payment for agricultural produce sold by farmers. (+)
12. APMC fails in checking colluding made by brokers in price fixing. (-)
13. APMC prevents distress sale of farm produces. (+)
14. APMC does not help farmers in getting higher returns of produces when consumer prices are high. (-)
15. APMC checks monopoly of agro-traders. (+)
16. APMC does not give a chance to the farmers to access larger markets to get benefits. (-)
17. I think APMC fails practically in preventing farm products trading exploitation. (-)
18. APMC lacks in coordinating line departments. (-)
19. APMC protects price-crash. (+)
20. APMC narrows the gap between farmer's sale price and the price paid by the consumers. (+)
21. APMC system boosts up agricultural export. (+)

2. Judges' rating on attitudinal statements

To judge the degree of 'Unfavourableness' or 'Agreement' to 'Favourableness' or 'Disagreement' of each statement to include in scale to measure feelings of farmers towards APMC on the five-point equal appearing interval continuums, another panel of 50 judges was selected. The judges selected for the study comprised of extension

educationists and other experts of social sciences working in Anand Agricultural University. The judges were visited personally along with a letter of instructions to guide them for rating the statements in the desired manner for each set of the above listed 21 statements. The judges were requested to give their opinion whether the listed statements can be included to construct a scale to measure the attitude of the farmers towards APMC or not. The judges were requested to give an opinion in five point equal appearing interval continuums of agreement viz. strongly agreement, agreement, undecided, disagreement and strongly disagreement with each statement.

3. Determination of Scale Value and Quartile Value

The five points of the rating scale were assigned with a score ranking from 1 for most unfavourable (most disagreement) and 5 for most favourable (most agreement). Based on the judgment of the 50 judges for each statement, the Median value or Scale value (S value) of the distribution and the Quartile (Q) value for the statement were calculated for each statement. Then the interquartile range was worked out by taking the difference between C_{75} (Q_3) and C_{25} (Q_1), that means $Q = C_{75} - C_{25}$ for each statement. After that S value and Q values of each statement were used to decide whether the particular statement should be a part of attitude scale or not.

The median value (S value) of the distribution and the Quartile (Q) value for the statement concerned were calculated with the help of following formulas.

Formula to find out Median or S value

$$S = L + \frac{0.50 - \sum P_b}{P_w} \times i$$

Where,

S = Median or Scale value of statement

L = Lower limit of the interval in which the median falls

$\sum P_b$ = Sum of the proportion below the interval in which the median falls

P_w = Proportion within the interval in which the median falls

i = Width of the interval which was assumed as equal to 1.0 (One).

Formula to find out value of C_{25} or (Q_1)

$$C_{25} = L + \frac{0.25 - \sum P_b}{P_w} \times i$$

Where,

C_{25} = 25th centile value of the statement

L = Lower limit of the interval in which the 25th centile falls

$\sum P_b$ = Sum of the proportion below the interval in which the 25th centile falls

P_w = Proportion within the interval in which the 25th centile falls

i = Width of the interval and is assumed to be equal to 1.0 (one)

Formula to find out value of C_{75} or (Q_3)

$$C_{75} = L + \frac{0.75 - \sum P_b}{P_w} \times i$$

Where,

C_{75} = 75th centile value of the statement

L = Lower limit of the interval in which the 75th centile falls

$\sum P_b$ = Sum of the proportion below the interval in which the 75th centile falls

P_w = Proportion within the interval in which the 75th centile falls

i = Width of the interval and is assumed to be equal to 1.0 (one)

4. Procedure to select or reject each statement to include in scale to measure attitude

To illustrate a procedure for understanding the frequency distribution of judgments made by the judges for the statement no. 3 on five categories is shown here. The data from the 50 judges were arranged in Table. The table 1 indicates that out of 50 judges, 19 judges were strongly agreed and believed that the statement no. 3 (APMC is proper system to secure farmers exploited by intermediaries) should be a part of the scale, while 21, 6 and 4 of them were agreed, undecided, disagreed and none of them were strongly disagreed for the same statement to include in the scale to measure attitude of the farmers towards APMC.

Table 1: Frequency distribution of judgment made by judges in five categories for statement no 3

n=50

| Sr. No | Distribution of judges based on an agreement for the statement no. 03 | Frequency | |
|--------------|---|------------|----|
| 1 | Strongly agree | ☞ ☞ ☞ IIII | 19 |
| 2 | Agree | ☞ ☞ ☞ ☞ I | 21 |
| 3 | Undecided | ☞ I | 06 |
| 4 | Disagree | IIII | 04 |
| 5 | Strongly disagree | - | 00 |
| Total | | 50 | |

As shown in Table 2, three rows were used for each statement. The first row gives the Number distribution (f) with which the statement was placed in each of the five categories. The second row shows the proportions (p) of these frequencies, viz. $19/50=0.38$, $21/50=0.42$, $06/50=0.12$, $04/50=0.08$ and $00/50=0.00$. This way proportions are obtained by dividing each number by a total number of judges (n=50). The third row gives the cumulative proportions (Cp) that are the proportion of the judgments in a given category plus the sum of all the proportions below that category, viz. Cp of category 1 is 0.38, for 2nd it is $0.38+0.42=0.80$, for 3rd $0.80+0.12=0.92$, for 4th it is $0.92+0.08=1.00$ and for 5th it is $1.00+0.00=1$.

Table 2: Summary of judgments made by 50 judges in five categories for statement no 3

| Statement no. 3 | Sorting categories | | | | | Scale value | Q Value |
|-----------------|--------------------|-------|------|------|------|-------------|---------|
| | 1 | 2 | 3 | 4 | 5 | | |
| f | 19.00 | 21.00 | 6.00 | 4.00 | 0.00 | 1.786 | 1.223 |
| p | 0.38 | 0.42 | 0.12 | 0.08 | 0.00 | | |
| c _p | 0.38 | 0.80 | 0.92 | 1.00 | 1.00 | | |

If the median of the distribution of the judgment for each statement is taken as the scale value of the statement, than the scale values can be found from the data arranged in Table 2 using the following formula.

$$S=L+ \frac{0.50 - \sum Pb}{Pw} \times i$$

Substituting in the above formula to find out Scale Value (S) for the statement no. 03 in Table 2, we have

$$S=1.50 + \frac{0.50 - 0.38}{0.42} \times 1$$

$$S=1.50 + \frac{0.12}{0.42} \times 1$$

$$S=1.50 + 0.285 \times 1$$

$$S=1.50 + 0.285$$

$$S=1.786$$

The lower limit (L) of the interval in which the median (1.50) falls, from above example, median falls in the category of 1 and 2.

$$L= (1+2)/2, \text{ thus } L=1.50$$

This way Scale values were found in the same manner for the other statements.

Thurstone and Chave (1928) used the inter-quartile range Q as a

means of the variation of the distribution of the judgments for a given statement. To determine the value of Q, two other values were measured, the 75th centile/ (Q_3) and 25th centile/ (Q_1).

The formula to obtain the 25th centile or (C_{25})

$$C_{25} = L + \frac{0.25 - \sum Pb}{Pw} \times i$$

For the statement no. 03 in Table 2 we have,

$$= 0.5 + \frac{0.25 - 0.00}{0.38} \times 1$$

$$= 0.50 + 0.657$$

$$C_{25} = \underline{1.157}$$

The following formula used to calculate 75th centile or (C_{75}),

$$C_{75} = L + \frac{0.75 - \sum Pb}{Pw} \times i$$

For the statement no. 03 in Table 2 we have,

$$C_{75} = 1.50 + \frac{0.75 - 0.38}{0.42} \times 1$$

$$C_{75} = 1.50 + 0.880$$

$$C_{75} = \underline{2.380}$$

Then the interquartile range was worked out by taking the difference between C_{75} (Q_3) and C_{25} (Q_1) thus; $Q = C_{75} - C_{25}$ substituting the values.

$$Q = 2.380 - 1.157$$

$$Q = \underline{1.223}$$

In this manner, the interquartile range (Q) for each statement was worked out for determinations of ambiguity involved in the statements. In the first stage of the selection, only those statements

were selected, whose median values were greater than Q values. In the case of statement no. 3, $S = 1.786$ and $Q = 1.223$. Hence the statement no.3 was selected in the first phase of selection of statement to include in the scale to measure attitude towards APMC.

Table 3: Method of selecting the statements for the scale based on scale value and inter-quartile range

| Statement Number | Scale value (S) | Inter-quartile range (Q) | Selection |
|------------------|-----------------|--------------------------|--------------|
| 16 | 3.62 | 1.48 | Selected |
| 14 | 3.10 | 2.18 | Selected |
| 17 | 2.96 | 2.94 | Not selected |
| 08 | 2.96 | 1.87 | Selected |
| 06 | 2.83 | 2.11 | Selected |
| 04 | 2.63 | 1.04 | Selected |
| 12 | 2.63 | 1.62 | Not selected |
| 19 | 2.44 | 1.70 | Selected |
| 18 | 2.44 | 1.93 | Not selected |
| 02 | 2.44 | 2.03 | Not selected |
| 21 | 2.23 | 1.85 | Not selected |
| 15 | 2.23 | 1.75 | Selected |
| 05 | 2.27 | 1.42 | Selected |
| 13 | 2.10 | 1.25 | Selected |
| 20 | 2.10 | 1.47 | Not selected |
| 11 | 1.90 | 0.94 | Selected |
| 09 | 1.90 | 1.15 | Not selected |
| 07 | 1.78 | 1.79 | Not selected |
| 03 | 1.78 | 1.22 | Selected |
| 10 | 1.67 | 2.25 | Not selected |
| 01 | 1.62 | 1.07 | Selected |

Thurstone and Chave (1928) described another criterion in addition to Q as a basis for rejecting or accepting statement to include in scales constructed by the method of the equal appearing interval.

Accordingly, when a few statements have the same scale values, the statement having lowest Q value should be selected. To understand this procedure, we can examine the statements for the scale in Table 3. Here statement no. 3 and statement no. 7 have equal scale values of 1.78 and 1.83 but Q value in case of statement no 3 is 1.22, is smaller than Q value of statement no. 7, which is 1.79. Thus, statement no. 3 was finally selected in the second phase of selection of statement to include in the scale to measure attitude towards APMC.

5. Final statement for attitude scale

Based on above explained criteria of selection of the statements considering the Median Value (Scale Value) and Q values, 12 statements numbering 1, 3, 4, 5, 6, 8, 11, 13, 14, 15, 16 and 19 of the original list were finally selected to constitute attitude scale. In the present example the scale values were ranged from 1.62 to 3.62. The final format of the scale to measure the attitude of the farmers towards APMC with 12 statements is given here.

| Sr. No | Statements | SA | A | UD | DA | SDA |
|--------|---|----|---|----|----|-----|
| 1 | I endorse that APMC is farmers' friendly approach to sale farm products. (+) | | | | | |
| 2 | The payment system of farm produces adopted under APMC is inappropriate. (-) | | | | | |
| 3 | APMC is proper system to secure farmers exploited by intermediaries. (+) | | | | | |
| 4 | APMC is an inadequate system to help farmers to sale farm products appropriately. (-) | | | | | |

| | | | | | | |
|----|---|--|--|--|--|--|
| 5 | APMC serves as a system to stop harsh conditions created by traders for farmers. (+) | | | | | |
| 6 | APMC is not a long-term solution to the problems of price inflation. (-) | | | | | |
| 7 | APMC ensures effective mode of payment for agricultural produce sold by farmers. (+) | | | | | |
| 8 | APMC does not help farmers in getting higher returns of produces when consumer prices are high. (-) | | | | | |
| 9 | APMC prevents distress sale of farm produces. (+) | | | | | |
| 10 | APMC does not give a chance to the farmers to access larger markets to get benefits. (-) | | | | | |
| 11 | APMC checks monopoly of agro-traders. (+) | | | | | |
| 12 | APMC protects price-crash. (+) | | | | | |

6. Administration of the scale

Twelve statements selected for the final format of the attitude scale were randomly arranged with new serial numbers to avoid response biases, which might contribute to low reliability and detract from validity of the scale. Out of the 12 selected statements, seven statements were positive and the indicators of the favourable attitude and five statements were negative and the indicators of unfavourable attitude. Against these 12 statements, there were five columns representing five points continuum of agreement and disagreement to the statements as followed by Likert (1932) in his summated rating technique of attitude measurement. The five points on continuum were strongly agreed, agree, undecided, disagree and strongly disagree with respective weights of 5, 4, 3, 2, and 1 for the positive or

favourable statements and of 1, 2, 3, 4 and 5 weights for the negative unfavourable statements.

7. Reliability of the scale

A scale is reliable when it consistently produces the similar results when applied to the same sample. In the present study, a split-half method of testing reliability was used.

Table: 4 Reliability test of scale using Split-half method

| Sr. No. | Score of odd Statements (X_o) | Score of Even Statements (X_e) | D ($X_o - X_e$) | d^2 | T ($X_o + X_e$) | t^2 |
|--------------|-----------------------------------|------------------------------------|-------------------|------------|-------------------|--------------|
| 1 | 25 | 28 | -3 | 9 | 53 | 2809 |
| 2 | 26 | 21 | 5 | 25 | 47 | 2209 |
| 3 | 27 | 26 | 1 | 1 | 53 | 2809 |
| 4 | 19 | 18 | 1 | 1 | 37 | 1369 |
| 5 | 19 | 17 | 2 | 4 | 36 | 1296 |
| 6 | 30 | 30 | 0 | 0 | 60 | 3600 |
| 7 | 24 | 22 | 2 | 4 | 46 | 2116 |
| 8 | 24 | 21 | 3 | 9 | 45 | 2025 |
| 9 | 17 | 19 | -2 | 4 | 36 | 1296 |
| 10 | 23 | 24 | -1 | 1 | 47 | 2209 |
| 11 | 21 | 19 | 2 | 4 | 40 | 1600 |
| 12 | 23 | 25 | -2 | 4 | 48 | 2304 |
| 13 | 20 | 30 | -10 | 100 | 50 | 2500 |
| 14 | 23 | 21 | 2 | 4 | 44 | 1936 |
| 15 | 30 | 30 | 0 | 0 | 60 | 3600 |
| 16 | 25 | 23 | 2 | 4 | 48 | 2304 |
| 17 | 19 | 22 | -3 | 9 | 41 | 1681 |
| 18 | 24 | 24 | 0 | 0 | 48 | 2304 |
| 19 | 24 | 29 | -5 | 25 | 53 | 2809 |
| 20 | 21 | 26 | -5 | 25 | 47 | 2209 |
| Total | | | -11 | 233 | 939 | 44985 |

Rulon's Formula:

$$rtt = 1 - \frac{\sigma^2 d}{\sigma^2 t}$$

$$\sigma^2 d = \frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n}$$

$$\sigma^2 t = \frac{\sum t^2 - \frac{(\sum t)^2}{n}}{n}$$

where,

rtt = Coefficient of reliability

$\sigma^2 d$ = Variances of differences

$\sigma^2 t$ = Variance of total score

Calculation:

$$\begin{aligned}\sigma^2 d &= [233 - (11)^2 / 20] \div 20 \\ &= [233 - 6.05] \div 20 \\ &= 226.95 \div 20 \\ &= \underline{11.34}\end{aligned}$$

$$\begin{aligned}\sigma^2 t &= [44985 - (939)^2 / 20] \div 20 \\ &= [44985 - 44086.05] \div 20 \\ &= 898.95 \div 20 \\ &= \underline{44.94}\end{aligned}$$

$$\begin{aligned}rtt &= 1 - [11.34 \div 44.94] \\ &= 1 - 0.252 \\ &= \underline{0.747}\end{aligned}$$

Twelve statements were divided into two equal halves with 6 odd numbered in one-half and 6 even numbered statements in the other-half. These were administered to 20 respondents. Each of the two sets of statements was treated as a separate scale and then these two subscales were correlated. The coefficient of reliability was calculated by the Rulon's formula (Guilford, 1954), which came to 0.747. Reliability is directly related to the length of the scale when we split to odd and even number items. The reliability coefficient which has been calculated is the value of half size of the original scale. In case of finding reliability using split half method, researcher needs to apply correction factor to consider final value of reliability. In this scale it was found 0.86.

The correction factor can be calculated by using Spearman-Brown formula.

$$r_{tt} = \frac{2r_{oe}}{1+r_{oe}}$$

Where,

r_{tt} = Coefficient of the reliability of the original test

r_{oe} = reliability of coefficient of odd and even score

$$r_{tt} = 2(0.747)/(1+0.747)$$

$$r_{tt} = 0.86$$

Thus, the scale developed was found reliable. To understand this procedure, we can examine the statements for the scale in Table-4.

The researcher should take note that such correction factor is not needed to apply when reliability is calculated using other than split half method.

8. Content validity of the scale

The validity of the scale was examined for content validity by determining how well the contents of the scale were selected by discussing it with specialists of extension and academicians of Anand Agricultural University. The content of the scale was realized applicable to measure the attitude of farmers towards APMC by the experts. Thus the present scale satisfied content validity.