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INTRODUCTION

Attraction is a key function of the physical universe – think about how a plant leaves towards the source of light. It is a law of, and force in Nature. In our mundane life, we are always attracted towards somebody. Attraction is easier to recognize than to define. Nevertheless, there is a general agreement that it refers to a kind of attitude we have towards other people. We all know about the greater lovers of history: Romeo-Juliet and Heer-Ranjha. But we probably gain more insight about attraction by asking ordinary people.

"She was," he proclaimed “so extraordinarily beautiful that my heart somersaulted. She was unquestionably gorgeous..." "Ah! What a face!" She exclaimed "Lean and tanned and so totally masculine..." That sorts of descriptions one gets from an attraction person. But how exactly do we signal our amorous interest and intent in each other? The investigator attempted to measure attraction and to pinpoint what factors and determinants along with the variables are important in the interpersonal attraction.

The present study is an attempt on the part of the investigator to establish a scientific scale from which one can measure as well as get an objective direction of the attraction level.

PROBLEM

To measure interpersonal attraction among adolescents* and to find out which factors (physical, social and psychological) and determinants (proximity, similarity, novelty, physical attractiveness and complimentarity) play a prominent role in attraction theory. Also to make a comparison and to determine the differences between each group of variables (medium of language, gender, socio-economic status and educational level).

* In boys, middle adolescence period is from 13-18 years of age while in girls it starts from 12 to 15-16 years of age. In boys, late adolescence period is from 18-21 years of age while in girls, it starts from 17 to 20-21 years of age. [2]
AIMS

1. To know scientifically at what level attraction does exist in adolescence.

2. Which determinants (proximity, similarity, novelty, physical attractiveness and complementarity) are more effective for attraction than other such determinants?

3. Which factors (physical, social and psychological) are more effective for attraction?

4. To find out the effectiveness of each variables (medium of language, gender, socio-economical status and educational level) in adolescent for attraction.

5. To study the differences among various group (gender vs. Socio-economic status, gender vs. Educational level, Socio-economic status vs. Educational level)

6. This scale can also be utilized in clarifying the matters regarding in their friendship choice.

STANDARDIZATION PROCESS

Test standardization is a continuous process beginning with the preparation of test items, passing them through the stages of the preliminary try outs, item analysis, a final try out of the test on a properly selected sample and ending with the establishment of norms.

For her research work the investigator channeled the standardization process of the ATTRACTION SCALE for both the media in the following scientific manner:

I. PRE-PILOT STUDY

The first step in the preparation of the scale was carried out by going through the literature regarding the topic and so forth. The investigator failed to find any scientific tests or scales through which one can determine the attraction level. The concept of attraction was vague at the beginning of the research. In order to clarify the terminology of attraction and to gain more insight, a seminar was held on February 23rd, 1999. The topic was on ATTRACTION THEORY. Eminent psychologists such as Dr. Bakshi (Senior Psychologist), Dr. A.S. Patel (Faculty member of state California university, USA), Dr. Bhalchandra Joshi (Investigator’s Guide) and other psychologists, professors of psychology department and students attended the seminar. As a result of this seminar the concept of attraction was further clarified: Operational definition of attraction and that of various determinants of attraction were discussed.
Initially a paper and pencil method of experiment was carried out between 15-16 to 19-20 years of school and collage students of both the gender, as the investigator desired to measure the attraction among the adolescent group (middle and late adolescence period). In order to get more detailed responses, six factors namely, physical, age, educational/qualification, social, emotional and gender factors were taken into consideration. The total number of persons in the sample was a 100, 50 male and 50 female student.

From these responses, separate checklists for both male and female students were chalked out. The checklists were formulated in detail. The items were related to three factors viz. physical, social and psychological. The determinants of attraction that were taken into consideration were viz. proximity, similarity, novelty, complementarity, familiarity, haloeffect and physical attractiveness. These items were then showed to experts who were selected from related walks of life. Many items were either rejected or modified as a result of their opinion. Finally 153 items for males and 166 items for female counterparts were finalized. In addition, a checklist was coined and given to the selected samples (adolescent group- school and collage students ranging from 15-16 to 19-20 years of age). The total number of persons in the sample was 140, which comprise of 70 male and 70 female students.

II. Pilot Study

In the second phase of research the investigator, on the basis of sample’s responses taken in the first phase of research, formulated an item scale along with its checklist. In the item scale each item was presented in a statement form. Both the scale and the checklist were related to the same factors and determinants that were taken in the pre-pilot study viz. physical, social and psychological factors as well as the determinants such as proximity, similarity, novelty, physical attractiveness, familiarity, haloeffect, and complementarity.

Again, the opinions of the five experts for each statement or item for its relevance to measuring attraction were sought. The instruction format given to the experts are printed in the Appendix [A] section. Finally, 80 statements for the scale and 62 items for the checklist were finalized and were checked by one language expert for their content, structure and language.

The experts then translated the scale and the checklist into Gujarati language. This was so because the investigator desired to measure attraction of the Gujarati medium students also. The investigator named the scale ATTRACTION SCALE for English Medium students and “…” for Gujarati Medium students.

The checklists were also named ATTRACTION-CHECKLIST and “…” respectively.

For the purpose of recording the responses of the sample, a rating sheet was prepared where the respondents could record their responses by putting a tick mark [✓] in the appropriate box. The scale itself was presented in two
The first page contained a detailed instruction with an example, and the second page contained the items in a statement form. The checklists were also printed in two pages. On the first page a very precise instruction was given. On the same page all items are presented on the left hand side of the page, while the boxes where the individuals of samples could record their responses conveniently by putting a tick mark[✓] were laid out on the right hand side of the page. Respondent's specifications such as name, age, gender, educational qualification were printed at the end of the section.

ATTRACTION SCALE is a five-point scale. It measures from strongly agreed to strongly disagree. An abbreviated form is presented as SA (Strongly Agreed), A (Agreed), I (Indifferent), D (Disagreed) and SD (Strongly Disagreed). These abbreviation are printed in the upper portion of each box so that the respondent won't be misled or confused and could therefore, record his responses correctly. An expert translated the whole presentation of the ATTRACTION SCALE and the ATTRACTION-CHECKLIST in Gujarati language. The model of these scales and checklists along with their rating sheets are detailed in Appendices (B, C, D, E, F, G) section.

The scales with their rating sheets and the checklists were administered to the persons in the sample. These samples were consisted of school and college students of both the genders and ages that ranged from 15-16 to 19-20 years of age (middle and late period of adolescence). The sample consisted of 100 students of English and Gujarati medium each, which means 50 male and 50 female. Thus, the total number of persons in the sample came to be 200.

III. ITEM SELECTION:

In this stage, the investigator sorted out the various scores obtained from the preliminary stage (Pilot Study) and tabulated the scores in descending order. The tabulation started from the highest scores to the lowest scores. The investigator then took 27% of the upper level and 27% of the lower level and applied t-test formula (\( t = \frac{\bar{X}_1 - \bar{X}_2}{s_{\bar{X}_1 - \bar{X}_2}} \)). A model of such calculation is printed in the Appendix[I].

The items that were found to be significant at .05 and .01 levels were selected. The same procedure was carried out for the Gujarati scale also.

Finally, on the basis of the results obtained after applying t-test formula, 40 statements for the scale and 20 items for both the checklists were selected. However, two separate scales for English and Gujarati were formed. Some of the statements of the scales for both the media are different because of their different results, though the contents of the checklists remain the same.

Nevertheless, the statements of both the scales are based solely on the three factors viz. physical, social and psychological. Also each statement of both the scales and of the checklists reflects the determinants of attraction viz. proximity, similarity, novelty, physical attractiveness and complementarity.
Further, the opinions of five experts were sought to recheck the contents of the scales, checklists and the presentation of the rating sheets.

In order to estimate the reliability and validity of the ATTRACTION SCALE of both the media, the investigator selected 80 subjects each for both the scales. These 80 subjects consisted of 40 girls and 40 boys. Thus, the total number of persons in the sample was 160. The age of the persons in the sample ranged from 15-16 and 19-20 years of age (middle and late adolescent period). The scales were administered to these selected samples.

The investigator then established the reliability and validity of the ATTRACTION SCALE of both the media by the following process:

IV. RELIABILITY:

The two qualities of any test in which the investigator is should be interested are its reliability and validity.

As used in psychometrics, the term ‘Reliability’ always means consistency. Test reliability is the consistency of scores obtained by the same persons when retested with the identical test or with an equivalent form of the test results from the reliability of a test refers to the consistency of scores obtained by the same individuals on different occasions or with different sets of equivalent items. In other words, the reliability of a test is its ability to yield consistent one set of measures to another. This concept of reliability underlies the error of measurement of a single score, whereby we can predict the range of fluctuation likely to occur in a single individual’s score as a result of irrelevant, chance factors. [5]

Reliability may be checked by comparing the scores obtained by the same test taken at different times, with different examiners, or under other relevant testing conditions. It is essential to specify the type of reliability and the method employed to determine it, because the same test may vary in different measuring technique. [1]

The term reliability has two closely related but somewhat different connotations in psychological testing. First, it refers to the extent, to which a test is internally consistent, that is, consistency of results obtained throughout the test when administered once. In other words, how accurately is the test measuring at a particular time? Secondly, reliability refers to the extent to which a measuring device yields consistent results upon testing and retesting. That is, how dependable is it for predictive purposes? Obviously, if a test does not have a high degree of reliability when used more than once, it can have but limited value in predicting an individual's future performance or level of development.

The two aspects of reliability are intimately related: for if a test is not highly reliable when used upon a particular occasion (i.e. internally consistent), it can have little predictive value. Since one of this principle uses of psychological tests is for prediction and planning for the subsequent
development and performance of individuals, a high degree of reliability is a 
sine qua non of a sound instrument. [5]

TYPES OF RELIABILITY

Methods of estimating reliability fall into two general classifications: 1. 
Relative reliability and 2. Absolute Reliability. The first of these is generally 
stated in terms of coefficient of correlation known as the Reliability 
Coefficient. Though infrequently, relative reliability is also reported at times in 
terms of analysis of variance. The second method, absolute reliability is 
stated in terms of the standard error of measurement, which is an estimate 
of the deviation of a set of obtained scores from their ‘true scores’. [5] 
The methods which the investigator used to derive the reliability coefficient of 
the ATTRACTION SCALE of both the media are mentioned in the below 
section:
1. Test-retest method
2. Split-half method
3. Rational Equivalent form
   (i) Kuder – Richardson formula
   (ii) Cronbach alpha coefficient

1. TEST- RETEST METHOD

The test-retest method is one of the oldest and at least at first glance, one of 
the most sensible methods of estimating the reliability of tests scores. 
Reliability is concerned with the consistency of test scores; the test-retest 
method directly assesses the degree to which test scores are consistent from 
one test administration to the next. The test-retest method involves;
(a) Administering a test to a group of individual’s,
(b) Re-administering that same test to the same group at some later time,
(c) Correlating the scores on the first test with scores on the retest.
The rationale behind this method of estimating reliability is disarming simple. 
Since the same test is administered twice, and every test is parallel with itself, 
differences between scores on the test and scores on the retest should be 
due solely to measurement error. [8]

Although apparently simple and straightforward, this technique presents 
difficulties when applied to most psychological tests. It is time-consuming. 
The experience of having taken the test the first time might result in some 
learning or improved skills, so that individuals on the second occasion are no 
longer ‘the same’ in all respects as they were on the first. If the test is 
repeated immediately, many subjects will recall their first answers and spend 
their time on new material thus tending to increase their scores, so the first 
and second testing should take place after some reasonable interval of time, 
in order to minimize the possible influences of intervening factors of 
developmental and chance changes. [5], [1], [8] &[6]

It is common to distinguish between reliability, which is the ratio of true to 
observed variance, and temporal stability, which refers to the consistency of 
test scores overtime. If true scores are likely to change overtime, this
distinction is both theoretically and practically important. Thus, test-retest correlations are often thought of as stability coefficient rather than reliability coefficients. This technique is most useful when one is interested in the long-term stability of a measure. [8]

As there are two different ATTRACTION SCALES, two different reliability coefficients of both the media were computed by using the Pearson Product moment formula \( r_{xy} = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2 \sum_{i=1}^{n} (y_i - \bar{y})^2}} \). The tables are presented in the following chapter.

2. SPLIT-HALF METHOD

In the split-half method, the test is first divided into two equivalent ‘halves’ and the correlation found for these half-tests. This technique is also used to find internal consistency.[5], [1] and[6]

Split-half methods of estimation reliability provide a simple solution to the two practical problems which plague the alternate forms method:
- (a) The difficulty in developing alternate forms, and
- (b) The need for two separate test administrations.

The reason behind this method is quite straightforward. The simple way to create two alternate forms of a test is to split the existing test in half, and use the two halves as alternate forms. The split-half method of estimation reliability thus involves:
- (a) Administering a test to a group of individuals,
- (b) Splitting the test in half, and
- (c) Correlating scores on one half of the test with scores on the other half.[8]

The split-half method is regarded by many as the best of the methods for measuring test reliability. One of its main advantages is the fact that all data for computing reliability are obtained upon one occasion; so that variations brought about differences between two testing situations are eliminated. A marked disadvantage of the split-half technique lies in the fact that chance errors may affect scores on the two halves of the test in the same way thus, tending to make the reliability coefficient too high. The reason is that the test is administered only once. The longer the test the less the probability that effects of temporary and variables disturbances will be cumulative in one direction, and the more accurate the estimate of score reliability.[6]

The investigator, for estimating reliability coefficient of split-half method used Spearman-Brown Prophecy formula \( r_{xy} = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2 \sum_{i=1}^{n} (y_i - \bar{y})^2}} \). after setting the two halves correlated. For doing so both the scales were equally divided into two halves. The first half of scores, consists of scores on odd items and the second half scores on the even -numbered items. Since this correlation would be for half the test. Spearman – Brown prophecy formula was used to augment the result for the whole test.
The results of reliability coefficient of both the scales for split—half method and the use of Spearman—Brown prophecy are tabulated and reported in the fourth chapter.

3. RATIONAL EQUIVALENT METHOD

The method of rational equivalent represents an attempt to get an estimate of the reliability of a test, free from the objections raised against the other methods of reliability outlined in the above section. This method of rational equivalence stresses the inter-correlation of the items in the test and the correlation of the items with the test as a whole.\[6] \&[1]

To estimate the reliability coefficients by the rational equivalence method for the ATTRACTION SCALE, the investigator made use of 'Kuder-Richardson formula 21', which is also known as 'K21'(\[1\]) \[\gamma_{11} = \frac{n \sigma^2 + \sum_{i} n_i \sigma_{i}^2}{\sigma^2 + \sum_{i} n_i \sigma_{i}^2}\]. The results of this method are tabulated in the forthcoming chapter.

In addition to all these methods of reliability mentioned in the above section, the investigator has also computed the coefficient of correlation by making use of 'Cronbach alpha coefficient. The formula is: \[2 \left(1-\frac{\sigma^2}{\sigma^2 \text{total}}\right)\]

The results are tabulated and reported in the fourth chapter.

V. VALIDITY:

Undoubtedly, the most important question to be asked about any psychological test concerns its Validity, that is the degree to which the test actually measures what it purports to measure.

Validity provides a direct check on how well the test fulfills its function. The determination of validity usually requires independent external criteria of whatever the test is designed to measure. The validity coefficient (high correlation) enables us to determine how closely the criterion performance could have been predicted from the test scores.

Before the test is ready for use, its validity must be established on a representative sample of persons. The more valid and reliable the test, the smaller will be the margin of error.

Validity tells us more then the degree to which the test is fulfilling its function. By studying the validation data, we can objectively determine what the test is measuring. It would thus be more accurate to define validity as the extent to which we know what the test measures.\[5, 1, 8 \& 6\]

There are two main approaches to measure validity: Logical approach and Empirical approach. The logical approach consists of logical analysis of the test score to decide what test measures. The empirical approach consists of experimental studies in which test scores are correlated with various criterion measures. [7]
TYPES OF VALIDITY

In the 1940's and the early 1950's, research on psychological measurement was characterized by a bewildering array of methods of defining and assessing validity. One of the many contributions of the American Psychological Association standards for psychological tests (1954) was the development of a fairly simple system for classifying procedures for assessing validity. The standards recognized various different ways of defining validity. [8]

1. FACE VALIDITY

This is a term used to characterize test materials that attempt to measure what the test's author desires to measure. That is, the test contains items that seem to be related to the variable being measured. The content of the test seems to be relevant to its stated purpose; and there is no further effort to confirm the assumption objectively. The earlier test makers used this criterion when there was scarcity of other available sources.

However, if face validity itself appears irrelevant, inappropriate, silly and childish to the person concerned then the results will be poor, regardless of the actual quality of tests. Thus it is not necessary that the test should be valid empirically, but it also requires having face validity to become effective in actual practice. According to this type of validity, the test content should appear to be relevant to its purpose. This too, is an operational conception of validity, based upon subjective judgement.

Face validity can often be improved by merely reformulating test items in terms that appear relevant and plausible in the particular setting in which they will be used. [1]

As the purpose of these scales is to measure attraction, the scales were given to the various experts for their inspection. The experts finalized the scales and verdict that each and every item of the ATTRACTION SCALE is valid on the face of it.

2. CONTENT VALIDITY

In a particular research project, the degree to which the independent and dependent variables accurately reflect or measure what they are intended to measure is called construct validity (Cook & Campbell, 1979; Judd Smith, & Kidder, 1991)[4].

To gather evidence for the validity measurement is to examine the content of the test. Judging the adequacy of the content of the test is the process called content validation. Content validity is established by showing that the behaviors sampled by the tests are a representative sample of the attribute being measured. Thus, content validity depends on both the test itself and on the process involved in responding to the tests. [8], [6] & [3].
Validity of content however, should not depend upon the subjective judgement of only one specialist. It should be based upon the careful analysis by several analysts.

Examination content validity therefore, requires judging whether each item - and the distribution of items as a whole – covers what the investigator wants to measure. This judgement rests on the test user more on the test author. The pattern set by the test author will rarely correspond perfectly to what the investigator intended to measure. [3]

In order to establish the validity of content, both the scales were given to the experts for examination of each statement, which contains various factors as well as determinants. In the expert panel, the investigator took opinions of psychologists, sociologist, a professor of psychology and lay public such as beauticians, models and theater artists (actors and actresses). Finally, the items that were selected by the experts were corrected to incorporate the expert’s suggestion.

3. FACTORIAL VALIDITY

Developed as a means of identifying psychological traits, factor analysis is particularly relevant to construct validation. Essentially, factor analysis is a refined statistical technique for analyzing the interrelationships of behavior data. [1]

In the process of factor analysis, the number of variables or categories in terms of which each individual’s performance can be described is reduced from the number of original tests to a relatively small number of factors, or common traits. A major purpose of factor analysis is to simplify the description of behavior by reducing the number of categories from an initial multiplicity of test variables to a few common factors, or traits. After the factors have been identified, they can be utilized in describing the factorial composition of a test. Each test can thus be categorized in terms of the major factors determining its scores, together with the weight or loading of each factor. Such a correlation is known as the factorial validity of the test. [1]

All the techniques of factor analysis are statistical and based upon the correlation and coefficient. After the statistical calculations have been made it is necessary for the investigator to bring to bear her psychological insights to interpret and name her statistical findings. [5]

All the techniques begin with a complete table of inter-correlation among a set of tests. Such a table is known as a correlation matrix. Every factor analysis ends with a factor matrix, that is a table showing the weight of loading of each of the factors in each test.

By factor analysis, three types of factors are distinguished: General, Group and Specific. A specific factor is present in one test but not in any of the others under study. A group factor is present in more than one test. A general factor is found in all the tests. If all correlations among a set of tests are
positive one can find a general factor. If there are any zero or negative correlation, among some sub-tests, a general factor does not appear. [3]

Several different methods for analyzing a set of variables into common factor have been derived. As early as 1901, Pearson (1901) pointed the way for this type of analysis; and Spearman (1904, 1927) developed a precursor of modern factor analysis. Kelley (1935) and Thurston (1947b) in America and Burt (1941) in England did much to advance the method. Many others have developed alternative procedures, modifications and refinements. The availability of high-speed computers is leading to the adoption of more refined and laborious techniques. Although differing in their initial postulates, most of these methods yield similar results. However, a comprehensive and much more advanced treatment can be found in Gorsuch (1983). [1]

The investigator has done the factor analysis of both the scales separately. In all, 15 factors were extracted, in each of both scales. However, out of these 15 factors, only 5 factors are taken into consideration as they were more prominent. The results of the factor matrix of both the scales are tabulated and the interpretation of this factor matrix are discussed the forthcoming chapter.

VARIABLES

Any research study includes variables of both types: Independent and dependent. In the present investigation, the variables under study are:

I. INDEPENDENT VARIABLES:

Physical, Social and Psychological factors.
Proximity, Similarity, Novelty, Complementarity and Physical Attractiveness which may be taken as determinants.
Socio-economic status: High-income group, Middle-income group and Low-income group.
Educational factors: Higher Secondary level and Under Graduate.

II. DEPENDENT VARIABLES:

Responses of the samples of students in both scales.

RESEARCH DESIGN

With the help of experts, the investigator designed two experimental layouts for both the mediums. The layouts were identical. Models of these designs is shown in the next page.
### Table 1.

DESIGN FOR ENGLISH MEDIUM STUDENTS

<table>
<thead>
<tr>
<th>Socio Economic Status</th>
<th>Income ([B_1]) High</th>
<th>Income ([B_2]) Middle</th>
<th>Income ([B_3]) Low</th>
<th>Income ([B_1]) High</th>
<th>Income ([B_2]) Middle</th>
<th>Income ([B_3]) Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher Secondary (C_1)</td>
<td>1)N=30</td>
<td>2)N=30</td>
<td>3)N=30</td>
<td>4)N=30</td>
<td>5)N=30</td>
<td>6)N=30</td>
</tr>
<tr>
<td></td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
</tr>
</tbody>
</table>

### Table 2.

RESEARCH DESIGN FOR GUJARATI MEDIUM STUDENTS

<table>
<thead>
<tr>
<th>Socio Economic Status</th>
<th>Income ([B_1]) High</th>
<th>Income ([B_2]) Middle</th>
<th>Income ([B_3]) Low</th>
<th>Income ([B_1]) High</th>
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<td>5)N=30</td>
<td>6)N=30</td>
</tr>
<tr>
<td></td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
<td>N=60</td>
</tr>
</tbody>
</table>
The above table indicates that the investigator took the same variables for both the mediums. These variables are describe in the following section:

**GENDER**
The investigator carried out the research on respondents of both the gender:
- Male
- Female

**SOCIAL ECONOMICAL STATUS**
In social economic status, the investigator took three levels:
- High-income groups above i.e. those parents were earning more than Rs.10,000 per month.
- Middle income group i.e. those parents were earning between Rs. 5,000 to 10,000.
- Lower income group i.e. those parents were earning less than Rs. 5,000.

**EDUCATIONAL FACTOR**
As the investigator attempted to measure the depth of attraction of adolescents, two periods of adolescence viz. middle adolescence period 15-16 years of age and late adolescence period 19-20 years of age were studied. The investigator took the responses of Class XI students who falls under the category of middle adolescence. The student of Second Years of college comes under the heading of the late adolescence.

**TOOLS**
The specific tool or scale employed for this purpose of the study was:
- Attraction Scale (English Medium)
- Attraction Scale (Gujarati Medium)
- Attraction –Checklist (English Medium)
- Attraction – Checklist (Gujarati Medium)

**SAMPLE**
The investigator for her research has selected the Stratified Cluster Sample also known as Multi-staged sample.

It is a Stratified sample, because of the following reasons:
1. The research was carried out on the two adolescent periods
   (a) Middle
   (b) Late
2. The investigator attempted to measure the levels of attraction of:
   (a) Students of both the gender.
(b) Students belonging to socio-economic status of the three levels viz. High-income group, Middle income group, and Low-income group.
(c) Students studying in both media: English and Gujarati.

Secondly, it is a Cluster sample, because the investigator administered her tests to the whole classes of both school and college students.

Thirdly, the institutions were selected on basis of three elements viz. Medium of language, socio-economic levels, and area wise. The name of this institution along with their location is printed in the Appendix [1].

The total number of persons in the sample is 720. The sample is equally divided into 360 each for both males and females. The distributions of the samples are showed in the research designs reported in the VI stage. However, all the samples were taken exclusively from Ahmedabad City as the study was aimed at only the urban students.

DATA COLLECTION

After preparing the scales, fixing the research design, and selecting different variables and samples, the investigator carried out the data collection process. The procedure was carried out in a formal manner.

In the first step, the investigator made lists of various schools and colleges of both the media. The finalization of the lists was carried out in such a manner, that the research was flanked to various areas. A formal letter was formulated and typed. A model of this letter is attached in the Appendix (J).

As the research was conducted on the adolescents group of Middle (15-16 years of age) and Late (19-20 years of age) period, the investigator made sure the selection of the samples. The samples were students of XI classes and of Second year of the College.

In order to carry out the research in a controlled situation, the institutions provided separate classes for the investigator so that the test could be administered peacefully. A class was composed of approximately 30-35 students. In order to satisfactorily carry out testing, help was taken of one more person (a student of psychology) as an assistant supervisor.

She then introduced herself and her task to the students of each class in the beginning. This introductory script is attached in the Appendix [K] section. At the time of the test administration, the investigator first of all, established a rapport with the students and tried to clear their doubts or confusion regarding the test. Then, the investigator with the help of an assistant distributed the papers bearing the scales and rating sheets among the students. After collecting the rating sheets and the scales, the investigator given out the checklists to the students. The whole work took approximately 40-45 minutes in each group.
The same procedure was carried out for both English and the Gujarati medium students. The only difference was that all the instructions were delivered in Gujarati language in Gujarati medium and in English in English medium classes. The introductory script delivered in Gujarati language is attached in the Appendix [ L ].

At the completion of the data collection process, the investigator processed the given responses and carried out the next stage (Use of statistical Methods).

NORMS

Norms is the average or typical score (Mean Median) on a particularly test made by a specify population. [1]

The test user is more concerned with the inference to be made from the test scores than with the actual number of items correctly answered. In psychological measurement, norms are averages obtained under prevailing conditions.

One of the most useful ways describing a person's performance on a test is to compare his or her test score to the test scores of some other person or group of people. [8]

When a person's test score is interpreted by comparing that score to the scores of several other people, this is referred to as a norm-based interpretation. The scores to which each individual is compared are referred to as norms, which provide standards for interpreting test scores. [3]

STEPS IN DEVELOPING NORMS

I. DEFINING THE TARGET POPULATION

A primary concern in the development of norms is the composition of the normative group. A general principle in developing norms is that the composition of the normative group is determined by the intended use of the test. A critical first step in the development and interpretation of norms is to ensure that the target group on which the norms are based is relevant and appropriate. [8]

As the investigator wanted to measure the level of attraction of the Middle as well as the Late period of adolescence, the target population were girls and boys of Higher Secondary and of the Under graduate levels of both the media. The students of Higher Secondary level viz. 15-16 years of age, falls under the Middle category of adolescent period, while the Under Graduate students viz. 19-20 years of age will come in Late adolescent period.
II. SELECTING THE SAMPLE

Once the test development has been fixed, the appropriate target group from which to obtain norms, is the second important step to obtain a representative sample of each of these groups. [8]

Selecting of the samples was carried out very carefully. As the study was conducted on the urban adolescent group, the investigator took the samples from urban area only. Representative samples were taken from different schools and colleges of both the media ranging from different areas of the city.

Secondly, the investigator also desired to measure the attraction level of the adolescents coming from Higher, Middle and Lower economic strata. For that purpose, the investigator made sure that the three economic groups viz. Higher, Middle and Lower are included in the representative sample.

As the research was carried out for both English and Gujarati medium’s students through two different scales, the representative samples for both the media were carefully selected. The total number was 880 in the sample that was carefully selected. The total number of persons in the sample was 440 of the English medium students of both the genders. The size of the sample for the Gujarati medium was also 440 students of both the genders. Overall, therefore, were 880 the number of the persons in the entire sample.

III. STANDARDIZING CONDITIONS

After the target population is carefully defined and the appropriate sampling techniques to obtain a representative sample are selected, the next step is to carry out the test administration. The conditions of measurement were an important concern. This is particularly true when norms are used in interpreting test scores. Unless conditions of measurement are adequately standardized valid comparisons of individual test scores for fixing test norms would be impossible. [8]

Keeping the third step of developing the norms in mind, the investigator administered the test for both mediums in standardized conditions.

IV. TYPES OF NORMS

There are various types of norms. Four of the most common forms are Percentile Norms, Age norms, Grade norms and Profiles.

For this research, the investigator opted for the Percentile Norms. The age of the students was more than 16, so age norms could not be determined as they form only one group.
PERCENTILE RANKS

The most common form of norms is percentile ranks, which represent the simplest method of presenting test data for comparative purpose. The easiest way to make comparisons is to rank scores from highest to lowest. Ranks depend on the number of persons in the group. If one wishes to examine change in standing from one occasion to another, we have difficulty because the size of the group changes. To avoid such difficulties, ranks are changed to percentile scores (also called Percentile Ranks and Centile Ranks). A percentile score is the rank expressed in percentage terms. Various writers use various terms; Percentile scores; Percentile rank; Percentile; Centile all these have only slight difference in meaning.

However, a person’s Percentile rank tells what proportion of the group falls below him.

By this method of computation, the person exactly in the middle of the group is at the 50th percentile. The 50th percentile is called the median of group. The median can be thought of as the performance of a “typical” person. [1], [8] & [3]

Percentile scores have several advantages. They are easy to compute and can be readily understood, even by technically untrained person. Moreover, percentiles are universally applicable. They can be used equally well with adults and children and are suitable for any type of test. It is apparent that percentiles show each individual’s relative position in the normative sample but not the amount of difference, between scores. The formula of percentile rank is \[ \text{Percentile rank} = i + \left( \frac{P - E}{100} \right) \times \frac{N}{4} \] (1)

The Percentile tables of both the media are reported in the next chapter with their graphs.

STATISTICAL ANALYSIS (ANOVA)

Most psychological research has progressed beyond the stage where there are only two conditions, an experimental and a control one that are compared with each other. To evaluate the results of such an experiment with multiple groups, the analysis of variance (abbreviation ANOVA) is used.

The heart of the analysis of variance procedure is a comparison of variance estimates. However, the researchers have found the null hypothesis a useful tool in testing the significance of differences. Null hypothesis means that there is number true significant difference between two population means, and that the difference found between sample means is, therefore, accidental and unimportant. The null-hypothesis is akin to the legal principle that a man is innocent until he is proved guilty. However, if the null hypothesis is untenable, it has to be rejected.

ANOVA uses F test for detecting the difference among various groups. The person who originated this test was the British statistician R.A. Fisher, and the
test is referred to as F test in his honor. The $F$ test is simply a ratio of the between-groups variance estimate to the within-group variance estimate. [4] & [5]

The investigator has formulated 14 hypotheses, viz. seven hypotheses each for both English and Gujarati medium. The entire 14 hypothesis along with the $F$ test tables is discussed in the following chapter.

As for the checklists, however, no statistical formulae have been applied. Instead, the investigator rounded up the percents of responses and tried to find out which items got the highest rank. The results are given in the next chapter.
REFERENCES