CHAPTER IV

STRUCTURE AND METHOD
IV. The Study : Structure and Method

4.1. Introduction

Man is an enigma. Each individual in a society reveals in himself the range of experience, configurations of self may vary, but the basic components are the same. The child's view of his environment and his place in this environment determines his reactions and his behaviour. Personality traits of any person is established in the early years of childhood. Since the physical and mental development of children in early years are incomplete, the investigator needs to depend on their mothers information to get the complete behavioural pattern of the children.

Since the parents are in constant observational contact and in continuous interaction with their babies it was decided that carefully conducted interview with the mother (principal care taker) was the most feasible approach to collect necessary observational data. This approach is advocated by Thomas, etal, (1971). The authors report on agreement at .01 level of significance between direct observation and parental interview in their New York Longitudinal study of infant behavioural profile, behaviour pattern interview schedule were chosen as one tool and face to face interview was conducted.

For obtaining information regarding, preference in the selection of clothes for the children, an interview schedule was prepared and face to face interview was conducted.

A tool was made for studying relationship exist among colour, pattern or design and shade, preference of children.

For measuring the self - concept of children, the pre - schooler's self-concept and picture test (PSCPT) was prepared with the help of a child psychology expert and an artist.

Schedule was devised to collect the information regarding the expressive behaviour of the children. In this a list of positive and negative characteristics was entered and after observation of the child for a day he was rated on a scale (five point) that represented the behaviour of the child when he is well dressed and ordinarily dressed.
### 4.2 Design of the Study

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<th>Aspects of measurement</th>
<th>Criteria of measurement</th>
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<td>2.</td>
<td>Mother’s preferences to children’s clothing.</td>
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The present study is intended to compare the behavioural Profile or temperament, self-concept and expressive behaviour of pre-School children who dress well and those who carelessly dress. Carefully conducted interview with mothers of the sample children and tests conducted with children is to give a correct picture of the personality pattern.

4.3. Nature of the study.

The Present study is basically a comparative study. It compares the temperament self concept and expressive behavioural profile, self concept and expressive behaviour of children belonging to different income group, well dressed and; ill dressed children and also their preference of colour, design and value of colour preferences.

4.4. Sample

The investigator fixed the age group of the sample between four and five years. A narrow range in age group gives more accuracy in answers. For the study, 150 pre-school children are drawn, 50 each (25 girls and 25 boys) from three income group of urban and rural areas. The home environment was almost similar for all the families belonging to each income group-in terms of extensiveness of the child's personal world, parental education, number of children and the like.

For selection of institutions random method was followed. A creche, a kindergarten, and four anganwadies were selected by lottery method and from these institutions the samples were drawn.

For studying mother's Preferences for dresses, colour, design and behaviour patterns, all the mothers of the samples formed the subjects.

The urban family atmosphere and the rural setting was not different because rural families were staying very close to the town and were sending their children to creche, Anganwadies and play schools which were on boundaries of urban areas.

Since Angamaly is situated in Ernakulam district the investigator consulted G.C.D.A. Cochin office for getting correct grouping according to the income and found that Low income is up to Rs. 2,665/- Middle income is up to Rs. 6,000/-per month and High income is above Rs. 10,000/-.
The children from high income and middle income were better placed in terms of physical, social and economic status which has a direct influence in clothing selection, selection of toys, books etc. their parents were higher in their educational level which affect the self-esteem of the children. The children from the low income families were disadvantaged because of their poor living conditions, poor educational level of their parents, non-availability of toys and dresses of their interests and the difficulty of the mothers in attending to their other needs.

4.5. Identification of areas

It consists of two processes

1. A series of discussions and consultations with the mothers and

2. drawing informations from the available literature.

Ten mothers of pre-school children between four and five years were choosen for the discussion. In the course of discussion, informations were drawn from each mother, regarding her child's activities, behaviour, self-concept, preference of colours, design, value of colour and preference of various styles of dresses for different occasions, mother's preference of colour, design and fabrics for her child's dresses.

The guide lines, the investigator kept in mind while conducting the discussions were based on the study of Hunt (1959) for colour, design, value of colour and preferences of various dresses. Yamamatto (1972) for PSCPT test for self-concept and ideal self-concept, Thomas (1994) for expressive behaviour. On the basis of these discussions and references, tools were constructed.

4.6. Tools for the measurement

The steps in the construction of the tools are described under the following headings.

Construction of the tools

The tool description

Administration of the test

Scoring

Tools for the measurement
Observation schedule for expressive behaviour of Pre-school children when they are dressed in dressy dresses and in ordinary dresses.

Pre-schooler’s self-concept picture test (PSCPT)

Test to investigate children’s preference of colour, design, value of colour and dresses for various occasions.

Parent questionnaire to elicit informations on selection of dresses.

Parent questionnaire for measuring temperament or behavioural profile for pre-school children

4.6.1 Construction of the observation schedule for expressive behaviour of pre-school children when they are dressed in dressy dresses and in ordinary dresses (vide appendix Ila and II b).

Based on the assumption that the stable, well adjusting child is one that is satisfied with himself. When a child dresses elaborately, he shows more self-confidence, vivacious and Proud. (Thomas 1994). A schedule has been devised to determine to what degree a subject meets this criterion.

First form

For constructing the observation schedule Lipsitt (1972), was referred to, in studying how the child behaves to others in different situations. It is a self-concept inventory with 15 positive and 13 negative items, scheduled for school going children. It is a five point scale with each item depicting expressive behaviour of the child.

Final form

The inventory was converted to an observation schedule as the samples are Pre-school children in the present study. Three more items were included which the investigator found as prevalent characteristics of Pre-schoolers. The schedule is a five point scale where the investigator has to indicate the range of behaviour from not at all, not very often, some of the time, most of the time and all of the time. The items of the schedule are as follows :-
Positive characteristics:
(18 items)
Pleasant, joyful, friendly, give up easily, attentive, energetic, happy, intelligent, obedient, polite, relaxed, secure, outgoing, proud, co-operative and popular, self-confident and generous. These occur due to positive instincts and motivation.

Negative characteristics:
(13 items)
Degree to which child’s behaviour can be interfered with or altered in contrast to pleasant or friendly behaviour.
(Distractible, lazy, depressed, dull, disobedient, rude, anxious, insecure, reserved, taciturn, aggressive, jealous and selfish)

Administration of the schedule.

The investigator is to observe the child on two days. First observation is to be done when the child is dressed in ordinary dress and on the next day the child is to be observed after wearing dressy dress. These judgements are to be made to the best of one’s ability, based on how the child expresses his behaviour on these consecutive days.

Scoring

The scores the investigator decided to give are as follows. Scores of one to five for each positive behaviour depending on the degree that the child indicates while observing. The scoring for negative expression of behaviours are to be reversed.

4.6.2. Construction on of the Pre-schooler’s self concept picture test (PSCPT)
(Construction and description of the tool vide appendix III).

The guide lines of PSCPT is taken from Yamamoto (1972) who designed and developed for the Pre-schooler. It consists of ten plates with paired pictures on each plate which represent personal characteristics those can be observed in Pre-schoolers.
The characteristics which are depicted on ten plates are related to the needs, concerns and developmental tasks of Pre-school children.

The investigator with the advise of the adviser, first tried with pictures of two temperaments and tested on five samples. An artist drew the temperaments/ emotions on drawing of girl child. Preliminary study showed that the boys were hesitant to answer when the illustrations of girl children were shown.

**Final form**

the investigator selected the most commonly observed seven items and made 14 sets (Separate sets for boys and girls) of pictures. Each item has two opposite extremes to depict, each indicating a positive and a negative characteristic.

The selected items represent the following characteristics.

Relaxed / Anxious

Outgoing / Reserved

Talkative / Taciturn

Energetic / Dull

Alert / Lazy

Friendly / Rude

Generous / Selfish.

These emotions are roughly sketched by a child Psychologist and with the help of an artist, the investigator drew two sets of pictures for both genders. These pictures are sent to five experts (child psychologists and artists) for their suggestions. According to their opinion necessary changes are made by redrawing a few pictures.

**Administration of the test.**

The test is to be administered individually. The child is to be seated on a chair in a quiet room free from distractions. Felt board is to be placed approximately a foot from the child. The board is to be located in a place with plenty of day light. Illustrations depend
(one set contains two illustrations one positive and one negative) as per gender is to be arranged in a single line. Throughout the test the degree of interest of the child is to be maintained. The child's attention is to be drawn to the picture and is to be asked “Which boy (girl) are you?” A second time they are asked to answer “which boy (girl) would you like to be?” Answer to the first question represent the child's self-concept. Answer to the second question represent his ideal self-concept. The greater the agreement between these two sets of answers, the greater the degree of satisfaction the child has for himself/herself.

Scoring

For positive answer one and for negative answer zero score is to be given. So when a child says all seven positive answers he/she gets 'seven' scores and vice versa.

4.6.3. Construction of the test for colour, design, value of colour preference, identification of dresses for various occasions (vide appendix -IV, IVa, IVb, IVc, and IVd)

Construction of the tool

Test for preference of hues

Hue is the name of the colour family. To investigate colour Preference, six hues were selected. Hues selected are red, orange, yellow, green, blue and violet. These are selected from Primary and secondary colours of the Prang colour chart. Six illustrations of shirts (for boys) and frocks (for girls) one in each of the standard hue formed the tool. Each hue in the illustrations are as highly saturated as possible.

Test for Preference of design.

To investigate pattern Preferences, simple and familiar patterns, a plan, a narrow vertical stripe, a small check, a geometric design are selected because these designs are commonly used for the printing of fabrics. Five designs drawn on shirts for boys and on frocks for girls in all six hues formed the tool. Totally there are 30 illustrations for boys and 30 illustrations for girls.

Test for preference of value of colour.

The lightness or darkness of a colour is called a value or tone. Any colour can be
lightened with white to make a tint or darkened with black to make a shade. To investigate value preferences, three levels are chosen, light, standard, and darker values, because with only three levels this combination of light, standard and dark, offer the best possibilities for making comparisons. The light value selected is approximately half way between the standard colour and white, the darker level approximately half way between the standard colour and black. Six sets of shirts for boys and frocks for girls, each set containing three illustrations (total there are 18 shirts and 18 frocks) formed the tool. For preparing the value, Mun sell's scale values (10) is considered. This is a ten point scale from black (0) to white (10). In each case the brightness level of the standard colour is determined by comparing it with the scale.

Tests for identification of style.

To study the identification of styles, four frocks for girls and four dresses for boys are bought as ready to wear shop. Regarding style, though there are numerous possible avenues of investigation, garments are limited to outer wear. Seasonal garments, fads and high fashions are not included. Styles are limited to those which are generally considered appropriate for children of the subject group and three income level. In this case it was obviously necessary to have two sets of illustrations, one set for boys and another set for girls. Each set, however, contain four styles ranging from school uniform to occasional dresses. These dresses form the tool for the study. To investigate style Preference or relationship between occasion and style, the subjects are to be asked which of the four styles the child would choose for a specific occasion. The four occasion selected are wedding ceremony, party, evening wear (home) and for school. The Pre-school children, included in this study are enrolled either in a nursery school or a day care and are therefore familiar with 'School uniform'. The wording of the question was given careful consideration. Simple words and short sentences are framed. The instructions to the subjects are to be given as to 'put your finger on the one you like best' for the specific occasion mentioned.

The tool description

To investigate preference of Hues, a test was constructed with illustrations of six shirts and six frocks in selected six hues namely red, orange, yellow, green, blue and violet.
For pattern Preferences, a plain and four simple and common patterns such as stripe, check, geometrical and naturalistic designs are selected. These five designs are illustrated on shirts for boys and on frocks for girls in all six hues. So there are 30 illustrations for boys and 30 illustrations for girls.

To study the value of colour preferences six sets of shirts for boys and six sets of frocks for girls, each set containing three illustrations (in light, standard and dark value) formed the tool.

For identification of dresses for various occasions, four simple and common dresses of two sets (one set for boys and one set for girls) were bought from ready to wear shop. Four styles consist of school uniform, party dresses, daily wear and dresses for wedding ceremony.

Administration of the test

The test is to be administered individually. The child is to be seated on a chair in a quiet room free from distractions. Felt board is to be placed approximately a foot from the child. The board is to be located in a place with plenty of day light. Illustrations (hues, pattern, value of colour and styles of dresses) depending on gender of the child is to be arranged on the felt-board. Throughout the test the degree of interest the child maintains is to be noted. The child's attention is to be drawn to the pictures/garments and asked him/her, to point out with a pointer (wooden stick) his/her preference. While he is pointing out, the investigator should mark the Preference by giving scores on the paper.

Scoring

For the preference of colour, score is to be given from six to one. For red highest score (six) is to be given. This is because red is the warmest hue which has a high intensity. For violet the least score (one) is to be given which is a combination of warmest and coolest hue (red and blue) which has a very low intensity.

For the Preference of Patterns highest score (five) is to be given to solid colour. This is because children belong to both sexes showed a common Preference. Least score (one) is to be given to naturalistic design because only female children preferred this.
Scoring for the value of colour is to be done by highest score (three) for light, (two) for standard and one for darkest value.

For appropriateness in selection of clothes, highest score (four) is to be given for wedding wear and least one for uniform.

A test-retest method (Anasthasi 1991) was used for finding out reliability of the test. While conducting test an retest, after making first and second preference ranked the remaining in sequential order. So the investigator repeated the presentation a number of time, by changing the order of the test for getting a constant preference of colour. Surprisingly, the investigator noticed that at this young age the children have their own preference for the colour, design and value of colour.

4.6.4. Interview schedule to Mothers.

An interview schedule was prepared to collect information regarding the selection of clothes, for Parents of the children, in order to investigate mother-child agreement in clothing preferences. Gupta (1991) opines that in face to face, interview the interviewer asks the questions pertaining to the survey and collects the information which will be first hand or original in character.

The investigator herself conducted a study in (1992) in same town by using the same questionnaire which was pretested and modified for the present study before implementing, and found very applicable. (Vide appendix V).

Description of the Schedule

The interview schedule elicits, informations regarding family background, clothing budget, purchasing habit, preference of material for different occasions, clothing selection of Previous year, factors influencing clothing consumption and satisfaction derived, selection of colours for children.

scoring.

Except for the selection of colours for children, for all the other questions numbers are taken into consideration.
4.6.5. Parent questionnaire for studying the behavioural profile of children.

Questionnaire developed by Thomas and Chess (1969, 1974), was used to gather information, on the way the child behaves in different situations of everyday life. (Vide appendix - VI).

It is a 72 item scale designed for pre-school children. It is a seven point scale with each item depicting behavioural pattern of the child in day to day situation. The nine dimensions of temperament and number of items under each category are as follows.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Number of Questions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity level</td>
<td></td>
<td>The amount of typical (7 questions) movement by the infant and the amount of active time each day.</td>
</tr>
<tr>
<td>Rhythmicity</td>
<td>(7 questions)</td>
<td>The Predictability or unpredictability of the child's daily patterns</td>
</tr>
<tr>
<td>Approach - withdrawal</td>
<td>(7 questions)</td>
<td>The child's initial response to a new stimulus.</td>
</tr>
<tr>
<td>Adaptability</td>
<td>(9 questions)</td>
<td>How easily the child's initial response to a new stimulus can be changed.</td>
</tr>
<tr>
<td>Threshold of responsiveness</td>
<td>(10 questions)</td>
<td>The intensity of some stimulus required to trigger a response.</td>
</tr>
<tr>
<td>Intensity of reaction</td>
<td>(9 questions)</td>
<td>The level of energy of the child's response, regardless or whether it is positive or negative</td>
</tr>
<tr>
<td>Quantity of mood</td>
<td>(7 questions)</td>
<td>Pleasant, joyful and friendly behaviour in contract to unpleasant or unpleasant behaviour</td>
</tr>
</tbody>
</table>
Distractability: Degree to which child’s behaviour can be interfered with or altered by an outside event (7 questions)

Persistence and attention span: How long the child purpose anyone activity, even in the face of obstacles. (9 questions)

These nine dimensions are clustered into two basic types by Indulekha (1977), based on their temperamental description as ‘Reaction pattern’ and ‘Intensity of reaction’, of children.

The reliability of the parent questionnaire - the temperamental scale to measure children’s personality in Indian setting (Kochi) was analysed and was already established. The split half reliability of the questionnaire was found and spearman Brown Prophecy formula was calculated. The reliability score obtained by Sarah (1991) was high (r=.91).

Parent questionnaire had scale values ranging from one to seven for alterations hardly ever, infrequently, once in a while, sometimes, often, very often and almost always, respectively. The total number of questions are 72. The subject has to circle any one of the choices, 1, 2, 3, 4, 5, 6, 7 and the more positive the answer is higher the score will be. A person who circles 7 get the highest score and one who circles ‘1’ will get the lowest score. The reverse pattern of scoring is to be followed for negative answers. The maximum score a subject could get is 504 and the minimum is 72. The total scores for each child is to be calculated.

A personal data sheet is attached to the interview schedule helped in drawing all possible information regarding the family composition, the member of people taking part in the care of the children and personal history of the child. It was filled up by the investigator before starting on main schedule.

4.7. Pilot study

A pilot study was conducted on 60 Pre-school children and their mothers to find out the reliability and validity of the list. Schedule for colour, design, colour value and style
preference, Pre-school children picture test (PSCPT), and schedule for expressive behaviour were considered.

A test retest method by Anastasi, (1991) was used for reliability of the tests. The results are presented in the following table.

**Reliability co-efficients**

<table>
<thead>
<tr>
<th>Tools</th>
<th>Method</th>
<th>Co-efficients</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSCPT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>what you are</td>
<td>Test retest</td>
<td>0.60</td>
<td>.01</td>
</tr>
<tr>
<td>what you</td>
<td>Test retest</td>
<td>0.78</td>
<td>.01</td>
</tr>
<tr>
<td>would like</td>
<td>Test retest</td>
<td>0.96</td>
<td>.01</td>
</tr>
<tr>
<td>to be.</td>
<td>Test retest</td>
<td>0.98</td>
<td>.01</td>
</tr>
<tr>
<td>way of dressing</td>
<td>Test retest</td>
<td>0.96</td>
<td>.01</td>
</tr>
<tr>
<td>ordinarily dressed</td>
<td>Test retest</td>
<td>0.96</td>
<td>.01</td>
</tr>
<tr>
<td>well dressed</td>
<td>Test retest</td>
<td>0.98</td>
<td>.01</td>
</tr>
</tbody>
</table>

A study of table indicates that for all the tests, the reliability co-efficient obtained are significant at .01 level. From this, it is clear that the PSCPT and expressive behaviour schedule are highly reliable.

**Validity**

Face validity was taken into account in the present study. The pilot study revealed that the tools are highly reliable and same tool can be used for the main study.

**4.8. Main study**

After establishing the reliability and validity for the tools the main study was conducted. Since the results confirm test reliability and meets the criterion of face validity the same tests were replicated for the main study.
Measurement

To study the expressive behaviour, the prepared schedule had a list of positive and negative characteristic behaviours. The investigator without child’s knowledge observed the child when she/he wore ordinary dress. A second observation was administered another day, when the child was dressed in a dressy cloth. On the previous day a note was sent to the mother for dressing the child well. Observations on both days were administered in normal daily works such as in the morning when she/he played, when she/he attended classes and when they had their tiffin. Only by observing all various activities the investigator could get answers for all questions in the schedule. While observing the investigator circled the score on a five point scale. For negative answers scoring was done in reverse manner.

Pre-school self-concept picture test containing seven sets (separate sets for boys and separate sets for girls) of paired pictures, which represents personal characteristics inherent the cultural environment of each Pre-schooler. The investigator visited concerned schools. After establishing good rapport with children, each child was called to a separate room free from distractions and she/he is seated on a stool. A felt board was placed approximately a foot from the child. The board was located in a place with plenty of day light. Illustrations (one set contained two pictures, one positive and one negative) depended, as per gender were arranged. The child’s attention was drawn to the picture and asked “which boy (girl) are you”? A second time he/she was asked to answer which boy/girl would you like to be”? one score was given for positive answers and zero for negative answers.

To study the preference of colour, the test was administered on individual child in a room with good lighting facilities. The illustrations of shirts for boys and frocks for girls one in each of the following colours (red, orange, yellow, green, blue and violet,) were pinned on the felt board as for the Previous test. Highest score six was given for red and the least score one was given for violet. The test was administered as it was given in the PSCPT test.

For studying the preference of design, six sets (in each hue) of five printed shirts for boys and frocks for girls were pinned on the felt board as for the colour preference
test. The order was from a solid colour, stripe, a check, a geometric design and in the end a naturalistic design. The child was asked to point out the best preferred design, second preferred design and in the same order till the last preference. Pattern preferences were presented to the samples only in his/her best liked colour, because there was a possibility that pattern preference might be affected by colour preferences. Scores were given in the order as five for solid colour, four for stripe, three for check, two for geometric and one for naturalistic design.

To test the value preference, light, standard, dark values were selected. Value preference were presented to the sample only his/her best liked colour. The test was administered in the same way as for the previous tests. For scoring highest score three was given for light value, two for medium and one for dark colour.

To identify the ability of the child to identify relationship between occasion and style, the subjects were asked which of the four styles would be chosen for a specific occasion. The four occasions selected were wedding, party, evening wear (daily wear) and school uniform. The test was administered as given earlier. The subjects were asked to point his/her finger on the dress she/he prefers for a particular occasion. Highest score four was given for identifying wedding wear, three for party wear, two for evening wear and one for school uniform.

Since transfer effects could occur among the sub parts or a systematic change in interest take place, the sequence of the presentation was randomised among subjects in order that such effects equally distributed over all conditions. For similar reasons, the order of arrangement of the illustrations on the felt board was also randomised among subjects. This randomisation was completed prior to the administrators of the specific sequence and order for a particular subject being recorded in the appropriate spaces provided in the answer sheets.

For studying the selection of clothes and dresses for children an interview schedule was used. It gave informations regarding factors influencing clothing purchases and preference of dresses. For the study number of respondents are taken into consideration for all the question. Scores were given only for the question regarding preference of colour for children.
An interview schedule was used to study the behavioural profile or temperament of Pre-school children. Face to face interview was conducted with each mother. Each question was a description of a behaviour in a specific situation with seven alternatives to choose from, the investigator just to circle the appropriate answer obtained from mother.

Personal data sheet attached to the interview schedule helped in drawing all possible information regarding the family composition, the number of people taking part in the care of the children and personal history of the child.

The target 150 subjects were selected from appropriate institutions which were selected by means of random sampling procedure. Prior permission was sought from authorities of the institutions, i.e., playschool, creche and four Anganwadies. The investigator with the request letter of her principal, personally contacted the authorities of the institutions. For each subject, all together it took two and a half hours for completing the schedules. It took one hour with each mother of the subjects to finish the two interview schedules. Another one and a half hour was taken with each child to complete interview schedule and the picture tests. Each day the investigator could complete studying three children. So it took almost 45 days for the compilation of the data collection. Before starting the collection of data the investigator visited the institutions very frequently and became familiar with parents / mothers of the children which enabled to clear all their doubts regarding the study and also the investigator could arrange the interview according to their convenience. This was very important because mothers were working during day time and few were unable to come to the institution due to some personal problems. So in such cases the investigator personally went to their houses and conducted the interview of the mothers and the tests for children were conducted in the institution itself. Thus it took the investigator nearly, two and a half months to complete the data collection.

4.9. Treatment of the data
The collected data was consolidated and statistically analysed.

The consolidated data was treated statistically by applying:
**F - test - (analysis of variance)**

*F* test was administered to find out the difference in personality Pattern, colour, design, value of colour and identification of dresses for various occasions of three income groups.

*F* is defined as:

\[
F = \frac{\text{Variance between the samples}}{\text{Variance within the samples}}
\]

symbolically:

\[
F = \frac{S_{1}^{2}}{S_{2}^{2}}
\]

*F* is always computed with the variance between the sample means as the numerator and the variance within the samples means as the denominator. This denominator is computed by combining the variance within the *K* samples into a single measure.

*F* does not pin point exactly where the differences are in a pair-wise way. That is, the three group differ significantly.

If the calculated value of *F* exceeds (0.05 df) the table value, it is concluded that the difference in sample means is significant at 5% level.

**Summary : Analysis of variance**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>sum of squares</th>
<th>Meansquare (Variance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>C-1</td>
<td>SSC</td>
<td>MSC-SSC/ (C-1)</td>
</tr>
<tr>
<td>Within samples</td>
<td>n-c</td>
<td>SSE</td>
<td>MSE - SSE/(n-c)</td>
</tr>
<tr>
<td>Total</td>
<td>SST</td>
<td>N-1</td>
<td></td>
</tr>
</tbody>
</table>
SSC - sum of squares between samples
SSE - sum of squares within samples
SST - Total sum of squares
MSC - Mean square between samples
MSC - Mean square within samples

T-test

T-test for small samples was chosen as the one of the statistical tool for finding out the overall differences between self-concept of well dressed and ill dressed; identification of dresses, and colour, design and value preference of well dressed and ill dressed children. To find out the significant difference in preferences of well dressed and ill dressed children.

The philosophy underlying this method is that significant differences rarely exist between every pair of treatment.

For the application of this method the treatment means (ill dressed) are to be arranged or sorted out from the general data and the well dressed are randomly selected from rest of the data. Every fourth subject of the well dressed samples were taken into account. Scores of well dressed and ill dressed subjects were calculated by applying the formula

\[
t = \frac{\bar{X}_1 - \bar{X}_2}{S\sqrt{\frac{1}{n_1 + 1/n_2}}} \quad \text{or} \quad \frac{\bar{X}_1 - \bar{X}_2}{S\sqrt{E_b}}
\]

\[
s = \frac{(x_1 - M_1)^2 + (x_2 - M_2)^2}{(N_1 - 1) + (N_2 - 1)}
\]

\[
SE = SD\sqrt{\frac{n_1 + n_2}{n_1 n_2}}
\]

\[
\bar{X} = \text{the mean of the sample}
\]

\[
n = \text{the number of observations}
\]

\[
SD = \text{the standard deviation of the samples}
\]
Ex1 = Sum total of one variable

Σx2 = Sum total of second variable

M1 = Mean of one variable

M2 = Mean of second variable.

If the calculated value of 't' exceeds 0.05 the difference is significant at 5 percent level, if it exceeds to .05. The difference is said to be significant at 1 percent level.

degree of freedom \( r = (n-1) \)

**Critical ratio**

The critical ratio was applied to find out the difference in the expressive behaviour of Pre-school children. Where the sample size is 75 each. The formula used for critical ratio is as follows.

\[
CR = \frac{m_1 - m_2}{\sqrt{\frac{\sigma^2}{n_1} + \frac{\sigma^2}{n_2}}}
\]

Where \( m_1 \) and \( m_2 \) are the means of the two groups, \( \sigma \) are the standard deviation of the two groups and \( n_1 \) and \( n_2 \) are the sample size of the two groups.

The formula used to complete the standard deviation was

\[
SD = \sqrt{\frac{N\Sigma x^2 - (\Sigma x)^2}{N}}
\]

The level of significance was found from the statistical table.

**Correlation**

Correlation is the relationship between two or more variable. The degree of relationship is measured and represented by the co-efficient of correlation. Of the several method of measuring correlations, the Karl Pearsons method, popularly known as pearsonian co-efficient of co-relation is most widely used in practice.
Where

\[ r = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{N\sum x^2 - (\sum x)^2} \cdot N\sum y^2 - (\sum y)^2}} \]

\[ \sum X = \text{sum of the } X \text{ scores} \]
\[ \sum Y = \text{sum of the } Y \text{ scores} \]
\[ \sum X^2 = \text{Sum of the squared } X \text{ scores} \]
\[ \sum Y^2 = \text{sum of the squared } Y \text{ scores} \]
\[ \sum XY = \text{sum of the products of paired } X \text{ and } Y \text{ scores} \]
\[ N = \text{number of paired scores}. \]

The value of co-efficient of correlation lie between ±1. when \( r = +1 \), there is perfect correlation between the variables. when \( r = -1 \), there is perfect negative correlation between the variables.

Correlation was calculated from the data between colour and self-concept, design and self-concept, shade and self-concept, self-concept and ideal self-concept, self-concept and temperament, preference of colour and design by mother and child. Correlation of reaction pattern and colour, intensity of reaction and colour.

**The chi square Test**

The \( \chi^2 \) test applies only to discrete data, counted rather than measured values. It is a test of independence. The \( \chi^2 \) is not a measure of the degree of relationship. It is merely used to estimate the electhood that some factor other than chance account for the apparent relationship. A significant \( \chi^2 \) finding indicates that the variables probably do not exhibit the quality of independence, that they tend to be systematically related and that relationship transcends pure chance or sampling error.

It is defined as:

\[ \chi^2 = \frac{(O - E)^2}{E} \]
Where O refers the observed frequencies and E refers to the expected frequencies.

To determine the value of $\chi^2$ the steps required are:

(i) Calculate the expected frequencies, in general the expected frequency for any cell can be calculated from the following equations:

$$E = \frac{RT \times CT}{N}$$

**Expected frequency**

\begin{align*}
RT &= \text{The row total for the row containing the cell.} \\
CT &= \text{The column total for the column containing the cell.} \\
N &= \text{The total number of observations}
\end{align*}

(ii) Take the difference between observed and expected frequencies and obtain the squares of these differences, i.e., obtain the value of $(O - E)^2$.

(iii) Divide the values of $(O - E)^2$ obtained in step (ii) by the respected expected frequency and obtain the total $E (O - E)^2 / E$. If $\chi^2$ is zero, it means that the observed and expected frequencies completely coincide. The greater the discrepancy between the observed and expected frequencies, the greater shall be the value of $\chi^2$.

The calculated value of $\chi^2$ is compared with the table value of $\chi^2$ for given degrees of freedom at a certain specified level of significance. If at the stated level (generally 5 percent level is selected) the calculated value of $\chi^2$ is more than the table value of $\chi^2$, the difference between theory and observation is considered to be significant.

If on the other hand, the calculated value of $\chi^2$ is less than the table value, the difference between theory and observation is not considered as significant.

**Yates Correction**

The Yates correction, also called Yates corrections for continuity are introduced
because the theoretical chi-square distribution is continuous whereas the tabulated values are based on the distribution of discrete statistic. The correction has the effect of reducing the calculated value of chi-square as compared to the corresponding value without correction.

In a special case of 2 x 2 contingency table the approximation may be improved, and bias arising out of the use of small theoretical frequencies may be reduced, by means of correction proposed F. The correction involves the reduction of deviation of observed from theoretical frequencies which of course reduce the value of chi-square. The working rule for the application of the correction is, adjust the observed frequency in each of the 2 x 2 table in such a way as to reduce the absolute deviation of the observed from the theoretical frequency for that cell by half; adjustment for all the cells are to be made without changing the marginal totals. The operation will increase f_{o} that is observed frequency, by half in each of two cells, and will reduce f_{e}, by half in inch of two cells. Another method of adjustment which gives the same result as the above procedure is:

\[
\text{(corrected)} = \frac{(O_{1} - E_{1}) - 0.5^2}{E_{1}} + \frac{(O_{2} - E_{2}) - 0.5^2}{E_{1}} + \frac{(O_{k} - E_{k}) - 0.52}{E_{k}}
\]

or

\[
\frac{(O - E^2/0.5)^2}{E}
\]

The results are presented in the following chapter.