## CHAPTER V
FINDINGS, DISCUSSION & EDUCATIONAL IMPLICATIONS

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CHAPTER - V
FINDINGS, DISCUSSION & EDUCATIONAL IMPLICATIONS

5.1 Introduction

The present investigation entitled 'A Study of Scientific Temper in Relation to Personality and Environment' was conducted on a sample of 505 science students, both girls and boys, studying in plus two classes of schools of Sonepat district. Sample schools were taken randomly from rural and urban areas of the district. Students of one school were taken as cluster. The data were collected with the help of the following tools -

1. Scientific Temper Scale
2. Eysenck's Personality Questionnaire
3. Home Environment Inventory
4. School Environment Inventory

The data were analysed using statistical techniques consonant with the objectives and hypotheses of the study.

5.2 Objectives Restated

The following were the objectives of the study

- To develop and standardise tool for measuring scientific temper.
- To investigate relationship between scientific temper and extroversion personality.
• To study the relationship between scientific temper and neuroticism personality.

• To investigate the relation between scientific temper and school environment dimensions.

• To study the relation between scientific temper and home environment dimensions.

• To study the significance of difference, if any, in scientific temper of rural and urban school students.

• To study the significance of difference, if any, in extroversion personality of rural and urban school students.

• To study the significance of difference, if any, in neuroticism personality of rural and urban school students.

• To compare significance of difference, if any, in scientific temper and extroversion personality of rural students as well as that of urban students.

• To investigate the significance of difference, if any, in scientific temper and neuroticism personality of rural students as well as that of urban students.

• To study the significance of difference, if any, between school environment dimensions for rural and urban students.
• To investigate the significance of difference, if any, between various home environment dimensions for rural and urban students.

5.3 Findings and Discussion

Extroversion personality is positive and significantly correlated with scientific temper \( (r=0.1892 \, p < .01) \). It is clear that extrovert, pupils who are active in the outer world activities have significant positive relationship with scientific temper. Thag (1979) reported that creative students were significantly better in abstract thinking, self concept independence, self sufficiency, intelligence and were more adventurous, relaxed, controlled and doubting.

Manjula (1995) viewed science literacy as to enable people to become aware of their surroundings, to apply the knowledge required in everyday life situations, to use their reason and critical ability in making decisions regarding their daily life and to participate effectively in issues and matters relating to impact of science on their lives and human races.

Neuroticism personality is found to be negative correlated with scientific temper and significant \( (r = -0.1483 \, p < 0.01) \). It means that a neurotic who is not stable and of wavering mind is not able to face the life situations boldly. Higher stability ensures scientific temperament. In other words less neurotic personality has greater scientific temper. Thag (1979) also reported that creative students were significantly better in emotional stability.
Coefficient of correlation of various dimensions of school environment such as creative stimulation ($r=0.2602$), cognitive encouragement ($r=0.3233$) acceptance ($r=0.2247$), permissiveness ($r=0.092$) and control ($r = 0.2258$) are positive and significantly (at 0.01 level) correlated with the scientific temper of the students. Creative stimulation provided with by the teacher to the students in their school makes children active in thinking and doing. Cognitive encouragement by the teachers encourages the students to know more about things. He is thus well equipped with scientific temper to face the world by attacking the problems and solving it scientifically. Further the 'acceptance' of the personality of child by giving him sufficient freedom to take responsibility of handling the problems through utilisation of his all potentialities, results into the change of his thinking and thus scientific temper is inculcated and developed in the students during schooling. Permissiveness provided by the teachers in the school, helps him to express his feelings freely and discuss the situations with his classmates and teachers resulting in sharpening and widening his outlook. Control in the school puts restrictions in order to discipline the students' behaviour and help them to keep on track. Though autocratic behaviour of the teachers is in bad taste but fruitful in some respects. No doubt, strict discipline is required to inculcate scientific temper. One dimension of school environment - rejection is negative but significantly related with scientific temper ($r=-0.2633 \ p < 0.01$). Rejection puts restrictions on child's behaviour so much that he can not deviate and act freely as an independent individual. This hinders his thinking
and affects his scientific temper. Hence lower the rejection higher the scientific temper. No doubt, it is manifest that school environment is an important factor for the development of scientific temper among students. It can be concluded that there is a significant relationship between scientific temper and school environment. Misra (1982) found that a significant relation existed between school environment (perceived by students) and scientific creativity. So school environment plays a greater role in developing scientific temper. Srivastava (1980) found that the amount of scientific knowledge or general exposure to science courses made impact on scientific attitude positively. Sarah (1983) found that the pupils' achievement was poor in general, in respect of understanding and application, as compared to their achievement in respect of the skills, knowledge and objectives of teaching general science in high schools.

Various dimensions of home environment such as control ($r=0.1019 \ p<0.05$), protectiveness ($r=0.1226 \ p<0.01$) punishment ($r=0.1456 \ p<0.01$), conformity ($r=0.2296 \ p<0.05$), reward ($r=0.2189 \ p<0.01$) and nurturance ($r=0.1125 \ p<0.01$), six dimensions out of ten are positive and significantly related with the scientific temper. 'Control' of the home disciplines the behaviour of child at least in the early period of his life and is very essential for the development of scientific temper. Over protection given to child at home does not help to make him independent but the results show that protectiveness is positively related with scientific temper in a significant way. This disposition can
not withstand the empirical testing and needs further investigation. Physical and affective 'punishment' both meted out to the child by the parents to avoid the occurrence of undesirable behaviour of child is considered desirable but that punishment should not be severe and at an improper time. Then alone it can be said to be encouraging scientific outlook/temper. Conformity implies that children act and work according to parents' desires, expectations and directions. This can be helpful for the development of scientific temper only when parents are oriented towards science. Reward, whether material or symbolic given by parents from time to time increases the probability of the desired behaviour of child. Reward is more effective than punishment in developing scientific temper. Nurturance implies parents' excessive, unconditional physical and emotional attachment with the child, which helps to inculcate scientific temper among students.

Four dimensions of home environment such as social isolation \((r = -0.1207 > p < 0.01)\), deprivation of privileges \((r = -0.0951 \ p < 0.05)\), rejection \((r = -0.1923 \ p < 0.01)\) and permissiveness \((r = -0.1524 \ p < 0.01)\) are negative and correlated in a significant way. Social isolation means that a child is isolated from beloved ones for negative sanctions. It badly affects his thinking which results into less development of scientific temper in the child. When the children are deprived of their rights to seek love, respect and care from their parents, it results in affecting their thinking badly. Thus, it hampers the development of scientific temper. Rejection implies putting further restrictions on child's behaviour and he
is not allowed to deviate, to act freely and hence cannot develop independent thinking, an essential requirement for scientific temper. Same is the case in school environment. Permissiveness of parents means that child is given opportunities to express his views freely and act without any interference from parents. Thus the disposition is difficult to interpret and needs further study. Further it is contrary to the result of permissiveness of the school teachers ($r=0.0920$ $p < 0.01$). Hence it needs further investigation. It is, thus, found that dimensional of home environment are correlated significantly with scientific temper; some negatively and some positively. None is insignificantly correlated. Saran (1970) also found that individual development of child with regard to curiosity, creativity, constructiveness and practical competence depends largely upon the presence of proper environment at home. Misra (1982) also found that significant relationship exited between home environment and scientific creativity.

Deopuria (1984) reported that the environmental approach showed greater cognitive gain in knowledge, understanding and application of science concepts related to environmental education at primary, middle and secondary school level.

Rai (1982) found that the creative and non-creative groups of students differed significantly in their problem solving ability.

Golwasker S. (1986) reported that non-tribals had higher level of creativity than the tribals on fluency components.
Pattnaik (1986) found that length of urban living didn't strongly correlate with scientific temper and science students were better on scientific temper. Singh (1988) reported that technology, society and teachers' own level of science and technology did not affect the attitude of teachers.

There is no significant difference between scientific temper of urban and rural school students. Thag (1979) found that the urban students were superior to the semi-urban students in scientific creativity.

Dani (1984) also found that the rural students have lower level of scientific attitude as compared to urban students. Shinde (1982) found that scientific attitude differed region wise.

There is no significant difference in extroversion personality of urban and rural students. Thag (1979) found that there was no difference in the pattern of personality correlates of creative children from the urban and the semi-urban areas. The semi-urban- students are more shy, restrained different and timid than their urban counterparts. The semi-urban boys were more rule bound, persevering, venturesome, socially bold, precise and self disciplined than the urban boys.

There is a significant difference between neuroticism personality of urban and rural students. Rural students are more neurotic than the urban students. It may be due to lack of employment opportunities and uncertain future due to many factors inherent in their environment.
There is no significant difference between scientific temper and extroversion personality of urban and rural students due to their concomitant nature.

There is significant difference between scientific temper and neuroticism personality of the urban students. It indicates that scientific temper may be negatively affected by the neuroticism personality in urban students due to their concomitant nature. There is no significant difference between scientific temper and neuroticism personality of rural students. This is difficult to interpret and needs further investigation.

There is a significant difference between creative stimulation of school for urban and rural students; between acceptance of school for urban and rural students. Dani D.N. (1984) reported that city students possessed higher field independence ability than the town and village students.

There is no significant difference in urban and rural students in respect of cognitive encouragement, permissiveness, rejection, control of school environment.

There is a significant difference in urban and rural students in respect of protectiveness, punishment, conformity, reward permissiveness of home environment. There is no significant difference between urban and rural students in respect of control, social isolation, deprivation of privileges, nurturance and rejection of home environment.
In view of the fore-going discussion, following conclusions appear tenable:

- There is a positive relationship between scientific temper and extroversion personality.
- There exists no significant difference between scientific temper and extroversion personality of rural and of urban students.
- There is negative relation between scientific temper and neuroticism personality.
- There is no significant difference between scientific temper and neuroticism personality of rural students. Rural students have more neuroticism than urban students.
- There exists a significant difference between scientific temper and neuroticism personality of urban students.
- No significant difference exists between scientific temper of urban and rural students.
- There is no significant difference between extroversion personality of rural and urban students.
- Dimensions of school environment viz., permissiveness acceptance control cognitive encouragement and creative stimulation have positive relationship with scientific temper. Rejection dimension of school environment have negative relation with scientific temper.
• There is a significant difference in creative stimulation and acceptance dimensions of school environment between rural and urban students.

• Six dimensions only of home environment such as control, protectiveness, punishment, conformity, rewards and nurturance have positive and significant relationship with scientific temper, and the others like social isolation, deprivation of privileges, rejection and permissiveness, have negative relation with it.

• Significant difference is only in protectiveness punishment, conformity, reward and punishment of home environment, between rural and urban students.

5.4 Educational Implications of the Study

The present study entitled "A Study of Scientific Temper in Relation to Personality and Environment" was undertaken by the investigator in order to find out such factors related to the students, which are responsible for the inculcation of scientific temper in the context of personality - extroversion and neuroticism and environment prevailing in schools and homes of students.

The investigator realised it very well that there are many factors which are attributed to the inculcation of scientific temper among students. Eysenck, is of the view that personality is made up of more or less stable components, Neuroticism, Extroversion and Psychoticism were considered important components of personality which are more or less fixed. Psychologist like Allport
G.W. (1937) considers scientific outlook/temper more or less hereditary and permanent. It has been found that extroversion personality does affect the scientific temper of the man. By applying EPQ Eysenck Personality Questionnaire, we can guide the students through analysis of their behaviour pattern, with a view to helping them, to develop scientific temper. Some other psychologists and behaviourist like Skinner, Mcdougal, Watson are of the view that the scientific temper/outlook can be developed/acquired through the environment of school and home. The two important factors school and home environment have been playing a great role in shaping, moulding, designing the behaviour of the students. This is supported by the analysis of the results and findings that school environment is a fundamental and the only factor that can do miracles in the life as a whole and may inculcate and developing scientific temper among the students, the future scientists who have to deal with the more complex problems of ethics and science, religion and philosophy. World peace is the responsibility of all of us. Young or old, student or farmer, the rich and the poor alike has to ponder over these problems. Only scientific temper can be a ray of hope to mankind who is wandering in the darkness of complexities of Modern Life and New Science. Scientific temper is the crying need of the hour and, therefore, the present study can be of immense use for the parents, teachers, planner, bureaucrats, technocrats and scientists in particular and man in the street, in general. It can help the authorities in selecting and admitting pupils to the science courses at the university level, in early identification of
exceptionally talented students in the field of science, creative and non-creative ones. The findings can be of much use to the curriculum framers/planner, administrators and science teachers.

5.6 Suggestions for Further Studies

As is usual with the correlation research, there is a partial support to the hypotheses proposed. Therefore, the partial support arrived at is sufficiently satisfactory under the field setting. The inconsistency of the findings are mainly due to interaction of many factors leading to a sort of forced levelling of the results. But no worker should feel complacent which may lead to scientific scotoma. Thus field studies should be considered to be of exploratory nature. The present investigation should be treated as such and a pointer for search for other variables. The present research tries to bring out the significance of relation between personality factors; extroversion and neuroticism, school environment and home environment with respect to scientific temper. But any study, however, wide it may be, its scope can not claim to be all inclusive and points out the scope for further investigation with other equally relevant variables. In an attempt for solution of the problem, new problems arise.

It is from this point of view, some suggestions are being made for further investigation of some of the important issues that seem to originate from the present work.
I. Similar studies may be conducted at college level.

II. Correlation studies may be undertaken related to scientific temper, adjustment and anxiety of secondary school students.

III. Similar studies may be conducted in special group of children such as handicapped, gifted and backward.

IV. A comparative study for the development of scientific temper in students of different faculties may be undertaken.

V. Longitudinal studies of development of scientific temper may be undertaken.

VI. Projective techniques may be used to study the behaviour pattern of those students who are having strong scientific temper.