

PUPIL'S ACADEMIC SELF-CONCEPT AND ACHIEVEMENT IN SCIENCE : THE EFFECTS OF HOME ENVIRONMENT

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Home is the social institution which has the most far reaching influence on the development of the child. It does not only provide the hereditary transmission of basic potentials for his development, but also provides environmental condition, personal relationships and cultural pattern, favourable and unfavourable, positive and negative, as reflected from its structure, social-economic and cultural status and the pattern of relationship and emotional state among its members (Kundu, 1977). The home also sets a pattern for the child's attitude towards people, things and institutions.

In view of the great significance of the family in shaping of children's personality development, numerous researchers made attempts to study the several factors of family ecology in relation to children's development and scholastic achievement. Mishra, et al (1960) found that children coming from high quality environment achieve better in school than their counterparts coming from low quality home environment. Morrow and Williamson (1961) while analysing the background of family factors responsible for higher achievement of school children, concluded that more congenial home environment, less parental domination and sympathy are

responsible for the achievement of the children. Studies by Dave (1963), Dayer (1967), Kellaghan (1977) found positive relationship between family environment and measures of academic achievements. Tabackman (1976) found gifted adolescents saw themselves as more independent, permissive and intellectual. These families were structured and cohesive than the families of non-achieving students.

Pandey (1985) reported punishment aspect of the home environment is negatively related to achievement among deprived and non-deprived girls. Other aspects of Home Environment (HE) viz., control, protectiveness, permissiveness, nurturance and reward are not significantly related to achievement in Hindi. She concluded that if proper punishment is given, children must perform in the school.

The nature and extent of relationship between home and specific academic self-concept appears to be a subject which though of great importance theoretically, has been largely unexplored at the hands of research workers. It has been postulated that specific academic self-concept develops in a stimulating environment. Since children pass more of their precious and active time during formative years in the home, its

influence cannot be ruled out. It seems that the effect of home has not been studied in depth with empirical approach. Hence, the present study aims to study the effect of family socio-psychological environment on Academic Self concept Scale in Science (ASCSSc) of junior secondary school students.

Hypotheses

The following hypotheses were tested:

- i) There is no significant relationship between HE dimensions and ASCSc of students.
- ii) There is no significant relationship between HE dimensions and ASc of students.
- iii) The students having low and high ASCSc do not differ in HE dimensions.
- iv) The students having low and high (achievement in science) do not differ in HE dimensions.

Sample

The sample constituted of 291 students (187 boys and 104 girls) studying in Class VIII in five different schools of Shadol (a tribal dominated) district of Madhya Pradesh.

Tools

The investigator used two instruments. The descriptions are as under:

(i) Home Environment Inventory (HEI)

The Home Environment Inventory prepared by Mishra (1989) measures ten dimensions of home

environment, such as control, protectiveness, punishment, conformity, social-isolation, reward, deprivation of privilege, nurturance, rejection and permissiveness. One hundred items are equally distributed and arranged in cyclic order according to the dimensions of the scale.

(ii) Academic Self-concept in Science Scale (ASCSc)

A Linkert type scale was developed by the author (1993) for his study. The scale consists of 50 items (25 pairs of bipolar items) arranged in cyclic order according to the dimensions in the scale. The reliability coefficients as calculated by test-retest methods was found to be 0.84. Internal consistency coefficients were calculated by using Cronbach procedure. The coefficients for the five dimensions of the scale ranged between 6.71 and 6.82. Intercorrelation coefficients between various dimensions were also calculated.

(iii) Achievement in Science

The marks obtained by the students in science subject in the annual examination of the previous class was taken from the school records.

Collection, Scoring and Tabulation of Data

The data were obtained by administration of the tools mentioned above to the subjects of the sample. The responses of the subjects recorded in the answer sheets were scored following the instructions given in the manuals and the scoring keys provided for the purpose. The scores were tabulated and necessary statistical treatments were given to analyse the data.

Results

(1) Relationship between HE Dimensions with ASCSc and ASc

Assuring normality in distribution of scores in ten HE dimensions, ASCSc and ASc, product-moment correlation coefficient has been calculated. The 'T' values are given in Table 1.

Table 1

Correlation Coefficient between HE Dimensions with ASCSc and ASc

| HE Dimension | ASCSc | ASc |
|---------------------------|---------|----------|
| Control | 0.17** | 0.31** |
| Protectiveness | 0.18** | 0.82** |
| Punishment | 0.06 | 0.09 |
| Conformity | 0.08 | 0.08 |
| Social Isolation | 0.21** | 0.02 |
| Reward | -0.02 | 0.01 |
| Deprivation of Privileges | -0.1 | -0.04 |
| Nurturance | -0.01 | -0.13* |
| Rejection | -0.01 | -0.26** |
| Permissiveness | -0.11 | -0.25** |
| | *P<0.05 | **P<0.01 |

- (a) Table 1 reveals that correlation coefficient between ASCSc and HE dimensions viz. control, protectiveness and social-isolation are positive and significant at 0.01 level. Other seven correlations are low and some are

negative or negligible. Therefore, hypothesis of no-significant relationship between these dimensions is rejected in former three cases and accepted in later seven cases.

- (b) ASc is positively and significantly correlated with control and protectiveness at 0.01 level. Again, ASc is also significantly correlated with nurturance, rejection and permissiveness at least at 0.01 level but negatively. Other five correlations are low and non-significant. Thus, the hypothesis of no-significant relationship between these dimensions is rejected in former five cases but accepted in later five cases.

(2) Comparison of HE Dimensions of High and Low ASCSc

The groups of students having high and low ASCSc were formed by taking into consideration the mean and standard deviation of scores. The mean and standard deviation of the scores of 291 students were found to be 113.69 and 10.64 respectively. Students having ASCSc scores ($M + SD = 113.69 + 10.64 = 124.33$) 124 were assigned to the group of students having 'high ASCSc'. Similarly, students having ASCSc scores less than ($M - SD = 113.69 - 10.64 = 103.05$) 103 were assigned to the group of students having low ASCSc. In a sample comprising 291 students, 55 fell into high ASCSc and 58 into low ASCSc group. Mean and SD of HE dimensions are summarised in Table 2. The t-values were also calculated to test the significant of difference in the HE dimensions of the two groups of students.

Table 2
Mean, SD and t-values of Scores on Ten Dimensions of HEI of High and Low ASCSc of Students

| HE Dimension | High Group | | Low Group | | t-values |
|---------------------------|------------|------|-----------|------|----------|
| | Mean | SD | Mean | SD | |
| Control | 23.77 | 2.87 | 23.45 | 3.30 | 0.55 |
| Protectiveness | 24.87 | 3.16 | 24.70 | 3.52 | 0.27 |
| Punishment | 25.16 | 3.45 | 25.02 | 3.33 | 0.22 |
| Conformity | 25.68 | 2.63 | 25.85 | 2.73 | 0.34 |
| Social Isolation | 20.98 | 3.31 | 21.27 | 3.71 | 0.45 |
| Reward | 23.80 | 3.36 | 24.05 | 3.17 | 0.41 |
| Deprivation of Privileges | 19.36 | 3.41 | 20.49 | 4.35 | 1.56 |
| Nurturance | 20.46 | 3.57 | 21.19 | 3.69 | 1.08 |
| Rejection | 18.70 | 2.98 | 18.90 | 4.20 | 0.30 |
| Permissiveness | 18.16 | 3.52 | 19.84 | 4.04 | 2.42* |
| | *P<0.05 | | | | |

As it is clear from Table 2, high and low ASCSc groups differed significantly in 'Permissiveness' of the home. Therefore, hypothesis of no difference in means of ASCSc scores of both the groups is rejected in favour of low ASCSc group. No significant difference was found in between the other nine dimensions of high and low ASCSc groups. Hence, the null hypothesis is retained in these cases.

(3) Comparison of HE Dimensions of High and Low ASC

High and low groups on the basis of ASC scores were formed as per the above procedure. The Mean and SD of 291 students were found to be

45.54 and 10.37, respectively. Students having (45.54 + 10.37 = 55.91) 56 were assigned to the high ASC group and (45.54 – 10.37 were 35.17) 35 were assigned as the Low ASC group. In the sample, 47 fell into high ASC and 95 into low ASC group. Mean SD of HE dimensions are summarised in Table 3. The t-values are also calculated to test the significance of difference in the HE dimensions of the two groups of the students.

Table 3
Mean, SD and t-values of Scores on Ten Dimensions of HEI of High and Low ASCSc of Students

| HE Dimension | High Group | | Low Group | | t-values |
|---------------------------|------------|------|-----------|------|----------|
| | Mean | SD | Mean | SD | |
| Control | 24.89 | 2.78 | 22.83 | 3.88 | 3.88** |
| Protectiveness | 25.02 | 3.12 | 24.37 | 3.46 | 1.12 |
| Punishment | 26.19 | 2.65 | 24.97 | 3.38 | 2.35* |
| Conformity | 25.87 | 2.29 | 25.69 | 3.11 | 0.39 |
| Social Isolation | 20.10 | 4.05 | 20.77 | 4.02 | 0.93 |
| Reward | 23.94 | 3.72 | 24.49 | 3.05 | 0.89 |
| Deprivation of Privileges | 19.38 | 3.82 | 19.95 | 3.77 | 0.84 |
| Nurturance | 20.00 | 4.41 | 21.77 | 3.35 | 2.42* |
| Rejection | 16.34 | 3.04 | 18.98 | 3.07 | 4.89* |
| Permissiveness | 17.40 | 3.13 | 19.99 | 3.65 | 4.39* |
| | *P<0.05 | | **P<0.01 | | |

It is obvious from Table 3 that high and low ASC groups differed significantly in their scores of control, punishment, nurturance, rejection and permissiveness. Therefore, hypothesis of no

difference in means of these HE dimensions is rejected in these cases. The high group outscored the low group in control and punishment aspects whereas the low group outscored high group in nurturance, rejection and permissiveness dimensions. No significant difference was found between the means of other five HE dimensions of high and low ASC groups. Hence the null hypothesis is retained in these cases.

Conclusion

It can be concluded that 'control' and 'protectiveness' are positively and significantly

correlated with both ASCSc and ASC whereas 'nurturance', 'rejection' and 'permissiveness' are negatively and significantly correlated with ASC. 'Social-isolation' is also correlated with ASCSc significantly.

'Less permissiveness' at home is the characteristic of high ASCSc and ASC pupils. More control, punishment, less nurturance, rejection and permissiveness is the nature of high ASC pupils.

Thus, the homes of high ASCSc are controlled, protective, socially isolated and less permissive and the high ASC are controlled, protective, punishing, less nurtured, less rejected and less permissive.

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