SUMMARY AND SUGGESTIONS
7.1 Summary

The present investigation was designed to study the antecedents of two cognitive styles. Field Dependence-Independence and Locus of Control. The term cognitive style refers to the characteristic ways in which individuals conceptually organize the environment.

Vitkin (1962/1974) provided the concept of Field Dependence-Independence (FD-I) cognitive style. This dimension reflects the degree to which people function autonomously of the world around them. In a field dependent (or global) mode of functioning, the overall organization of the field dominates perception; in a field independent (or articulated) mode of perceiving, the parts of the field are experienced as separate from the surrounding field (Vitkin et al., 1972; Vitkin et al., 1974).

Locus of Control (LOC) cognitive style refers to the degree to which an individual perceives that the events that happen to him or her are dependent on his own behaviour.
(internal control) or are the result of fate, luck, chance or powers beyond his personal control and understanding (external control). This concept originated as an expectancy variable in Rotter’s (1966) Social Learning Theory.

Berry (1966, 1971, 1974, 1976) and Sitkin and his associates (1974, 1975) have argued that cognitive style develops as a function of socialization and ecological and cultural 'press' that tend to form distinctive patterns of perceptual style between cultures differing along certain parameters of ecology and culture. A number of models have been developed within which a variety of independent variables have been examined as antecedents of cognitive styles (e.g. Berry, 1966, 1971, 1975, 1979; Dawson, 1967, 1969, 1975, 1981; Van Leeuwen, 1978). In this study the antecedents which have been studied are derived from Berry's (1979) Soc-Cultural Model. Ecology and acculturation are two independent variables which through cultural and biological adaptations influence cognitive styles. Sex differences (role diversity) and family authority structure are cultural adaptations while degree of urbanism and socio-economic status are acculturative variables. Family size and birth order determine an individual’s role diversity. In view of the above, antecedents were divided into two categories: socio-cultural antecedents (sex, intelligence, socio-economic status and degree of urbanism)
and family antecedents (family authority structure, family size and birth order). The relevant antecedent variables for this study have been chosen on the basis of the survey of the related literature (Western as well as Oriental).

This review suggests that though quite extensive Western data regarding antecedents of cognitive styles are available, there are very few relevant researches in India. Moreover, a number of cross-cultural studies have highlighted different patterns of antecedents in different cultures (Nedd and Schwartz, 1978).

Berry (1980) also emphasizes the importance of cross-cultural psychology and states that cross-cultural research seeks to comprehend the systematic covariation between cultural and behavioural variable and can also infer causal relations. Moreover, Wachtel (1972) suggested that any determination of the perceptual articulation dimension of cognitive style should involve more than one measure if the interpretation of the result is to be consistent with the original study (see also, Witkin et al., 1954). Keeping this in view, two measures of field dependence-independence i.e. the EFT and the INBD were employed. In addition, Bloom (1964) and Vernon (1969) have pointed out that there is usually a syndrome of mutually interacting factors that affect cognitive development. A multivariate research suggests that influential factors are closely linked in the environment and that clusters of 'benign'
context factors are necessary to promote the development of field independence. Consequently a multivariate approach has been preferred in this study. In addition, Reid and Ware (1971) argued that it should become possible to make differential prediction of highly specific types of behaviour as subareas of perceived control are identified. Due to this argument a tridimensional scale of locus of control is employed in the study.

**Design**

The study was conducted in two Phases. For Phase I, $2 \times 2 \times 2 \times 2 \times 3$ i.e. sex x intelligence x socio-economic status x degree of urbanism, between groups factorial designs were employed to study the main and interactive effects of these independent variables on the EFT (two indices), KBD as well as three dimensions of locus of control i.e. 'Internality', 'Powerful Others' and 'Chance'. The variables of age, educational level, nature of schools (i.e. Government schools) were controlled.

In Phase II of the study, students were matched in terms of intelligence level, socio-economic status, area of residence, sex, age, educational level, etc. The differences in family antecedents between field dependents and field independents (defined in terms of the EFT and the KBD) were investigated. Similarly on 'Internality', 'Powerful Others' and 'Chance'
dimensions of locus of control the differences due to these family antecedents between internals and externals were also studied.

Sample

1314 High school students of High and Higher Secondary Schools of Delhi city, Mandi towns and rural areas of Mandi, Himachal Pradesh participated in the study. These schools were randomly selected. Out of these students, equal number of high and low intelligent boys and girls at high and low SES from urban, semi-urban and rural areas were randomly selected. There were a total of 24 subgroups having 12 students in each subgroup. Hence Phase I of the study comprised of a total sample of 288 students.

The students for Phase II of the study were selected out of the sample involved in Phase I of the study. The field dependents and field independents (on the basis of the EFT and the KBD) designated as such were separated out and matched pairs of boys and girls were chosen. Similarly the designation of 'internals' and 'externals' was carried out on the basis of 'Internality', 'Powerful Others' and 'Chance' dimensions, separately.

Tools Used

Following tools were used for Phase I of the study:
(i) Raven's Progressive Matrices (Raven et al., 1977).
(iii) Embedded Figures Test (Witkin et al., 1971).
(iv) Koh's Block Design Test.
(v) Tridimensional locus of control scale (Levenson, 1974).

For Phase II of the study, Children's Interview Schedule (Nijhawan, 1972) was employed.

Data Collection

Phase I: The students were administered Raven's Progressive Matrices. High intelligent (percentile 75 or above) and low intelligent (percentile 10 or below) students were chosen; and SES Scale was administered on them. On the basis of $M\pm SD$, equal number of high and low SES students (boys and girls) from urban, semi-urban and rural areas were selected. The EFT and the KBD were administered under the standard instructions. Tridimensional locus of control questionnaire was also filled in by these students.

Phase II: Pairs of field dependent and field independent students on the EFT and KBD were separated out. They were matched in terms of level of intelligence, socio-economic status, area, school, age, etc. Similarly matched pairs of 'internals' and 'externals' in terms of 'Internality',
'Powerful Others' and 'Chance' dimensions were selected. All these selected students were asked to fill the Children Interview Schedule dealing with their family authority structure. Information about their family sizes and birth order was collected when the socio-economic status scale was administered. A family with five or less members was designated as 'small family' and with more than five members as 'large family'.

Statistical Analyses

Phase I

(i) Three $2 \times 2 \times 2 \times 3$ ANOVAs were applied for the EFT (two indices) and KBD measures.

(ii) Three $2 \times 2 \times 2 \times 3$ ANOVAs were conducted to study the three dimensions of locus of control.

(iii) Scheffe's tests were applied wherever interactions were found to be significant.

(iv) Five correlation matrices were computed to study the intercorrelations of intelligence, EFT (two indices), KBD and locus of control ('Internality', 'Powerful Others' and 'Chance') among high as well as low SES boys and girls.
Phase II

(i) Chi-square tests were applied to study the differences between 'first' and 'later born' field dependents and field independents (defined in terms of the EFT and the KBD) and 'internals' and 'externals' on 'Internality', 'Powerful Others' and 'Chance' dimensions of locus of control.

(ii) 't' tests were computed to study the differences between field dependents and field independent boys and girls attributable to family authority structure. Similar analysis was carried out for 'internals' and 'externals'.

(iii) 't' tests were also applied to study the difference between field independents and field dependents, and internals and externals due to family size.

Major Findings

Phase I : Socio-Cultural Antecedents

Section A : Field Dependence Independence

(1) Boys are more field independent than girls. But this finding holds good at higher level of intelligence only. At lower level of intelligence, no such differences are present. Moreover, high intelligent girls are more
field independent than low intelligent boys, so intelligence acts as a moderator in sex differences on FD-I (all indices). Further, in case of KBD only boys are more field independent than girls, only at higher level of intelligence with low SES. At high SES, boys are more field independent than girls at higher as well as lower level of intelligence.

(ii) Regardless of sex, socio-economic status and degree of urbanism, the higher the level of intelligence, the more field independent a high school student will be (both EFT and KBD).

(iii) High SES fosters field independence in students more than the low SES (EFT). This statement is true in case of boys only. Further, the observed sex differences are present at high SES only. When variables of sex and SES are considered together in the study of PD-I, these two variables operate in such a manner than one variable tends to reduce the effect of the other variable. SES does not emerge as an antecedent of PD-I measured by the KBD.

(iv) Urban and semi-urban students are more field independent than their rural counterparts (all indices). However, this finding holds good at higher level of intelligence.
only. No such differences are found at lower level of intelligence. Moreover, high intelligent rural students are more field independent than low intelligent urban and semi-urban students. Thus intelligence acts as a moderator in the study of differences on PD-I due to degree of urbanism.

(v) In case of KBD, low SES-high intelligent students are more field independent than their high SES-low intelligent counterparts. Further, high SES girls are more field independent at both levels of intelligence. No such differences are present in boys.

Section B: Locus of Control

(i) Sex does not emerge as an important antecedent variable of locus of control (all dimensions). However, in case of 'Powerful Others' and 'Chance' dimensions it interacts with intelligence and degree of urbanism significantly in affecting locus of control.

(ii) In both 'Powerful Others' and 'Chance' dimensions of locus of control high intelligent students are less external than their low intelligent counterparts regardless of sex, socio-economic status and degree of urbanism.
(iii) High SES students are less external on 'Chance' dimension of locus of control than their low SES counterparts regardless of sex, intelligence and degree of urbanism.

(iv) Urban and semi-urban high school students are less external than their rural counterparts on 'Powerful Others' dimension of locus of control regardless of sex, intelligence and socio-economic status. However, only in case of girls (both 'Chance' and 'Powerful Others' dimension) semi-urbarans are less external than rurals at higher level of intelligence while no such differences are observed at lower level of intelligence. Further, in case of 'Powerful Others' dimension, urban boys are less external than their rural counterparts at lower level of intelligence only.

Phase II: Family Antecedents

(1) Family size does not emerge as an important antecedent of two cognitive styles i.e. Field Dependence-Independence and Locus of Control.

(ii) Family authority structure is not an important antecedent variable in determining field dependence independence and 'Internality' and 'Powerful Others' dimensions of locus of control.
(iii) In case of 'Chance' dimension of locus of control, the wife-dominating family authority structure is more prevalent in 'external' girls than their 'internal' counterparts.

(iv) In case of 'Chance' dimension of locus of control more home tension is perceived by 'external' than 'internal' boys.

(v) Birth order does not emerge as an antecedent variable of field dependence independence and locus of control.

**Secondary Findings**

(i) Intelligence as measured by RPM and PDI as measured by EFT and KBD are significantly related.

(ii) Students at higher level of intelligence are less external on 'Powerful Others' dimension of locus of control than the students at lower level of intelligence.

(iii) Two indices of EFT can be used interchangeably and KBD can be used as an important and additional measure of FD-I.

(iv) The students external on 'Powerful Others' dimension of locus of control are likely to be external on 'Chance' dimension of locus of control. But such is not the case with 'Internality' dimension of locus of control.
Possible interpretation of the observed findings have been put forth.

7.2 Suggestions for Further Research

Field Dependence-Independence

(i) A high correlation between intelligence and PD-I measures calls for convergence studies among different measures of cognitive styles.

(ii) Future studies can do well to check inferences about the specific consequences of analytic ability by also examining (a) groups equated on analytic IQ but differing in verbal IQ and/or (b) groups which differ in analytic IQ but which are equated in total IQ.

(iii) There are many mutually interacting factors of socio-economic status like schooling, nutrition, education, parents' education, income etc. It will be interesting to study in future the description and classification of specific, environmental context factors and their separate, differential impact on the cognitive development of males and females.

(iv) Increased perceptual abilities, test taking skills, and the encouragement of using one's cognitive skills may
influence measures of cognitive style substantially. These are results of formal education. This variable can be studied in future research.

(v) The family authority structure taken in the study is perceived family authority structure. An indepth analysis of families with the help of parental interview will be in order.

**Locus of Control**

(i) The absence of sex differences suggests that researchers should develop I-E assessment instruments that either eliminate sex role bias in responding or are designed so that different aspects of the scale are appropriate for males and females and are scored differentially.

(ii) The alteration of the IPC Scale format, in which the resp one options were reduced, may have adversely affected the discriminant validity of the Scale. Thus it is suggested that further research be conducted, using the original format.

(iii) More extensive research is needed on cognitive styles associated with birth order and sex. Further, birth order researchers should consider (a) analysis by family size or control for family size, (b) analysis of 'only' children as a separate category from 'first born'
children with siblings and (c) analysis for sex and SES differences.

(iv) Investigators must exercise considerable caution in cross-cultural research involving the I-E construct, since its various components may have different meanings in different populations.

(v) A rather low correlation between SES and locus of control is not surprising, since the range of SES taken was not wide and sample come from a relatively homogeneous middle class background. So diverse group in terms of SES should be included.

(vi) The stability and independence of the subscales of Levenson's Scale need to be established for culturally divergent populations.

(vii) Analysis of individual items can contribute toward a better understanding of what the scale measures across different variables.