ABSTRACT
                This paper presents a research study that explored
the nature of the cognitive preferences of school administrators. It
offers insight into the school administrators' mode of information
processing. The first of three sections concerns the informational
centrality of school principals. Citations from the literature are
used to present the ways administrators handle information. The
second section gives background and discussion on cognitive
preferences. The work of Heath (1964) and the development and
modification of the Cognitive Preference Test provide the starting
point for the study. The third section concerns the study of school
principals' cognitive preferences. Discussed is the development of a
Management Cognitive Preference questionnaire, its internal
consistency, and its validation. The test was administered to 134
school administrators in Israel. The results were compared to those
of previous studies to highlight similarities in the
interrelationships among the different cognitive preferences. Tables
include demographic information, the differences in cognitive
preferences among school principals according to different role
categories, intercorrelations of scores in cognitive preferences, and
varimax factor analysis. Conclusions are tentative as the study is
the first conducted with school administrators. (Contains 32
references.) (RR)

THE COGNITIVE PREFERENCES OF SCHOOL PRINCIPALS

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The Cognitive Preferences of School Principals*

The purpose of this study is to explore the nature of the
cognitive preferences of school administrators, thus opening up a new
line of inquiry which may provide a base for future studies on
administrative behavior. In particular it offers an insight into the
school administrators' mode of information processing and thus may
add explanations to the way schools operate and for the possible
static nature of schools and holds implications for the preparation
of school administrators.

The discussion will be elaborated as follows: First, analyzing
the central role of school principals as an information nerve center.
Second, elaborating the roots of the "cognitive preference" idea.
Third, describing, analyzing and discussing an explorative study of
school principals' cognitive preference, ending with some
orientations for future studies.

The Informational Centrality of School Principals

There is a strong belief that school principals hold a crucial
position in influencing educational processes and in generating
school effectiveness (Pitner, 1988). Different approaches to study
the mechanism by which such influence operates have been developed.
Pitner (1988) summarized five models of relating the school principal
or the school administrator to the various characteristics c' school

effectiveness -- the direct effect model, the moderate effect model, the antecedent effect model, the reciprocal causation model and the mediating effect model.

One of the common denominators of the five models is the perception of the key position that the school principal or administrator holds as a coupling agent between the environment and the school on the one hand, and between the inner school components, such as school climate, teachers' behavior, and students' work and achievements on the other. The importance of this position can be better understood in viewing the school system as a loosely coupled system (Weick, 1976). This can be seen, for instance, in Bossert et al.'s (1982) model of school principal's influence which places the principal management behavior between personal characteristics, such as intelligence, skills, orientations, and preparation, between environmental characteristics, such as rules, policies, community expectations, and program requirements, and the inner school components of school climate, instructional organization and student learning. In this model the personal and environmental character- istics precede the school principal management behavior. Similarly, Ellet and Walberg (1979) place the school principal perception, intent and behavior as the major variables in their linking reciprocal model. In both models the school principal has a major role in mediating outside information through personal attributes.

School principals, in their boundary-spanning or linking agent role (Scott, 1981), interact with the environment in two major modes, by linking strategies that forge connection between the organization

and the environment, and by buffering strategies which close the organization artificially from perceived outside disturbances and uncertainties (Scott, 1981). Most interestingly, one of the major buffering strategies is through information processing (Hallinger and Murphy, 1986; Goldring, 1990). The school principal as a boundary spanner becomes responsible for the flow of information into the organization.

This strategy clearly parallels Mintzberg's (1973) metaphorical view of the administrator position as an organization information nerve center. This metaphor emphasizes the central position school administrators are engaged in in receiving, processing, and moving information. More specifically, Mintzberg (1973) distinguishes among three informational roles: the monitor role, in which the administrator receives or seeks information, the disseminator role, in which the administrator regulates and passes information into the organization, and the spokesperson role, in which the administrator transmits information from the school outside. Therefore, the way administrators perceive and treat information - their cognitive preference of information - the way information is selected, regulated, processed and transmitted into the school becomes of major importance. How do school principals confront information? Do they relate to it as knowledge to be remembered, or do they refer to it according to its applicability? Do they try to look for the principles behind knowledge? Or do they question or criticize information? Furthermore, are there differences in these respects among school principals according to personal variables as age,

gender, experience and education?

Cognitive Preferences - Background and Discussion

The conceptualization of the term cognitive preferences was first introduced by Robert Heath in 1964 in *Educational and Psychological Measurement* (Heath, 1964) as an innovative means to measure and evaluate the achievements of the new curriculum reforms in science that had been initiated in the 1960s. Heath's underlying assumption was that what is important is not only whether the student can identify correct and incorrect information but also what he/she is likely to do with information intellectually. The differing modes attending to information he termed cognitive preferences (op. cit., p. 241).

Heath differentiated among four modes of cognitive preferences: a) relating and recalling information without considering its implications, practicabilities, or limitations; b) relating to information according to its practical applications in various connections and situations; c) posing critical questions about the information's validity, its generalizeability, completeness, or limitations; d) relating to information according to the fundamental principles, concepts, or relationships it represents. These were termed "memory for specific facts or terms" (R), "practical application" (A), "questioning" (Q), and "fundamental principles" (P) (op cit., p. 243).

To test the idea of the different cognitive preferences, an instrument was developed called the Cognitive Preference Test, which

consisted of twenty-four option multiple choice items. Each of the four options represented one of the cognitive preference modes. All the alternatives were factually correct, and the students were clearly told so. The instructions were to "choose the option that has the most appeal or is most satisfying to you" (op cit., p. 242). An example of an item follows:

The pressure of a gas is directly proportional to its absolute temperature.

A) The statement, as given above, fails to consider effects of volume changes and changes of state.

B) Charles' or Gay-Lussac's Law.

C) The statement implies a lower limit to temperature.

D) This principle is related to the fact that overheated automobile tires may "blow out."

The selection of alternative A represents a Questioning preference, B will contribute to the score on Memory, C stands for student's Fundamental Principle preference, and D will add a point to the Practical Application score. Each student received four scores, one score for each of the preferences. Each of these four scores represents the sum of scores of the various items. The profile of all four scores constitutes the preference pattern of the student.

Since the inception of the cognitive preference construct in 1964, as was discussed by Tamir's meta-analysis, over 100 studies have been conducted (Tamir, 1985). Most of them focused on comparing various cognitive preferences of high school students as related to

different curriculum orientations, mainly in science. A few, however, compared cognitive preference of students to those of their teachers (Tamir, 1977, 1979), and some expanded the scope to include older students, such as college students (Tamir and Kempa, 1977) or medical school teachers (Tamir and Cohen, 1980).

Different researchers developed their own tests according to the specific subject matter, where the number of items ranged between 20-40. In some cases the scoring method was changed when those tested were asked to choose the most and the least preferred alternative, or to rank the preferences (Kempa and Dube, 1973). When ranking is used the four scores in the test are interdependent, or ipsative (Cattel, 1944; Baurenheind, 1962; Hicks, 1970) and certain statistical treatments are precluded. The advantage of this procedure is that "all responses appearing in an item contribute to a student's overall cognitive preference profile, unlike in the normal procedure of response selection where rejected options are treated as equally unattractive" (Kempa and Dube, 1973, p. 281). Different researchers followed different patterns, and the debate as to whether to prefer ipsative or the normative response design has not been resolved (Brown, 1975; Tamir and Lunetta, 1977; Williams, 1975).

The question to what degree do cognitive preferences differ or add to the classical treatment of cognitive styles was debated as well, when the main argument was that cognitive styles presuppose relative stability over time, and to a large extent are independent from the information content (Siegel and Siegel, 1965; Witkin et al., 1967). The reactive argument, summarized by Kempa and Dube

(1973) and Tamir (1977), was that studies have found distinct differences in thinking styles to emerge from various curricula treatments, and that cognitive preferences are pervasive across disciplines, possessing consistent patterns of interrelationships.

The major question of the validity of the construct itself was challenged by several researchers (Brown, 1975; Jungwirth, 1978; Rost, 1983; Van den Berg, 1979). Several studies concentrating on empirical validation were conducted over the years (Tamir 1981; Van den Berg et al., 1982), providing answers to specific questions. A comprehensive meta-analysis (Tamir, 1985) offered the following conclusion: the results of the meta-analysis "indicate that the cognitive preference construct demonstrates a reasonable level of validity, (and) that cognitive preferences make significant contribution to learning" (p. 13). This has been the starting point for this study.

The Study of School Principals' Cognitive Preferences

The study was carried out in Israel, but as an exploratory study the emphasis was to explore the possibilities in adopting the cognitive preferences idea to administrative behavior rather than to diagnose Israeli school administrators.

A Management Cognitive Preference questionnaire was developed. To the best of our knowledge, with the exception of medicine, this is the first time that the study of cognitive preferences was adapted outside the realm of school subjects, such as biology or chemistry. Undoubtedly, this poses serious problems in developing a suitable

instrument, since we are moving from relatively "tame" issues to "wicked" issues (Rittel and Webber, 1973), which are less defined and do not have a clear and unequivocal set of evaluative categories.

One of the trends that educational administration as a field of inquiry appears to be moving toward is the increased awareness of the complexity and comprehension of educational administration as a subject and of the school administrator as a role (Willower, 1988). In building the questionnaire an attempt was made to differentiate among the variety of components which comprise the school principal's role. The categorization was based on three components: pedagogical, human relations, and administrative (Caspi and Inbar, 1979; Inbar 1980). This categorization is a conjunction of several distinct analytical frames developed by various scientists in the field: Katz's (1955) three-skill analysis (technical, human, and conceptual skills); Griffiths' (1956) tridimensional framework of the job, the person, and the social setting, when the job is classified into improving educational opportunities, developing personnel, community relationships, and maintaining funds and facilities; Mintzberg's (1973) three categories of managerial role activities, the interpersonal, the informational, and the decisional; Gorton and McIntyre's (1978) role classification used in NASSP's study on secondary school principals (statesperson, educational, supervisory, organizational, administrative, and team role); Miklos' (1980) approaches to school administration emphasizing different administrative processes, task areas, and school principal activities (school program, student population, staff, community relations,

physical facilities, and management); and Sergiovanni's (1987)
forces of educational leadership (the technical force, human force,
educational force, symbolic force, and cultural force). Obviously
there is no claim that this categorization is absolute; other and
different ones can and should be tested as well in future studies.
Since each of the three categories consists of only nine to ten
items, the differential analysis by subtests should be treated
cautiously, focussing more on the total score analysis.

The first questionnaire developed contained 38 items and, after
a pilot test, ten items were eliminated, either because their scores
did not have any distribution or because they caused problems in
understanding. The questionnaire was constructed according to
Heath's original style. It was based on a statement with four
multiple choice answers, when each of the four options represented
one of the cognitive preferences. As in all cognitive preference
questionnaires, all the options were correct, and the subjects were
asked to "choose the answer that has the most appeal or is most
satisfying to you." Four sample items follow:
One of the social theories assumes that common activities will
increase the possibility of group crystallization.

    a) By initiating more common activities the school principal
        can crystallize the teachers as a team. (Application)

    b) Group crystallization is increased by common activities
        of its members. (Recall)

    c) This statement implies that inner group identification
        increases as a function of common activities. (Principle)

d) The statement as given above fails to consider the possibility that common activities might sharpen disagreements. (Questioning)

Leadership behavior influences the group behavior it operates on.

a) The ability of the leader to influence derives from group agreement to accept his/her influence. (Principle)

b) It is possible to influence group behavior by replacing the leader. (Application)

c) It is still important to know in what circumstances will group behavior differ from the leader's expectations. (Questioning)

d) There is a connection between leader behavior and group behavior. (Recall)

Sociometry is an instrument that can assist the teacher in measuring interpersonal relationships in the classroom.

a) Sociometry helps the teacher to understand the relationships among the classroom pupils. (Recall)

b) Is it possible to rely only on sociometric tests to diagnose classroom interrelationships? (Questioning)

c) Sociometry measures forces of attraction and rejection that are operating among pupils in the classroom. (Principle)

d) Sociometry can facilitate the teacher's group work in the classroom. (Application)

Every organization should enforce some control on its members.

a) It would be interesting to know what types of control the organization can exert on its members. (Questioning)

b) The need for control is derived from the organizational hierarchical structure. (Principle)

c) Through control of information it is possible to control the members of the organization. (Application)

d) Control over organization members is part of organization responsibility. (Recall)

The classification into cognitive preference modes was judged by a group of ten experts, and every option which had not been agreed upon by at least 90 percent of the judges was rewritten. Then the categories were tested for internal consistency, as will be shown below. However, the classification of answers to four predesignated modes needed further validation. Hence, our results were compared to the results of previous studies in order to bring to light similarities in the interrelationships among the different cognitive preferences.

We adopted in this study Kempa and Dube's (1973) approach by asking those tested to arrange the options within an item in an order of preference by allotting four votes to the most preferred option, three votes to the next preferred, two to the next one, and one vote to the least preferred response. As an exploratory study the advantage of this procedure is its broader range and that all responses appearing in an item contribute to the overall cognitive preference profile of the school administrator.

The test was administered to 134 school administrators in Israel: 35 senior school administrators as department chairs and 99

school principals and vice principals, characterized by the following distribution:

Gender:	26% men	Age:	<35	13.3%
	74% women		36-40	26.5%
			40-45	25.8%
			46-50	20.3%
			50>	14.1%

Experience in teaching:	up to 10 years	29.5%
	11 to 20 years	19.0%
	21 to 30 years	43.9%
	31 years and above	7.6%

Experience in administration:	up to 5 years	43.5%
	6 to 10 years	26.7%
	11 to 20 years	26.0%
	21 years and above	3.8%

Level of education:	only teaching certificate	14.9%
	B.A. degree	59.0%
	M.A degree	26.1%

Type of school:	1-6 grade elementary schools	38.8%
	1-8 grade elementary schools	27.6%
	special schools for handicapped	5.2%
	middle (junior high) schools	11.9%
	high schools	16.4%

The relatively high percentage of women reflects the high proportion of elementary schools in the study, which have a greater number of female principals. Age and experience are grouped here, but in the analysis itself they are computed as continuous variables. Although the 134 school administrators are distributed along the variables, thus reflecting the general school administrator distribution in Israel, most of them came from the Jerusalem area. Hence, they are not necessarily a representative sample of Israeli school administrators.

The questionnaires were collected by two methods. The first group of 24 questionnaires were collected during a Jerusalem school

administrators' meeting in which 30 administrators attended. (The
rate of return was thus 80 percent.) The second group of 110
questionnaires were collected by visiting most of the schools in the
Jerusalem district and 8 schools outside the district. This personal
approach yielded full cooperation and only a handful of school
administrators did not return the questionnaire. (The rate of return
was 92 percent.)

It has to be reemphasized that the purpose of this study was to
explore the possibilities inherent in the cognitive preference idea
rather than to classify the Israeli school administrators according
to their preferences.

Cognitive Preference Profiles

As an exploratory study which for the first time employs the
cognitive preference construct to school administrators, when the
importance of reliability and of consistency in results are of major
importance, it seems to be necessary to present the results in
comparison with other major results, mainly those where adults
(medical school teachers and college students) were the focus of the
study, as well as with the meta-analysis outcomes, all of which might
strengthen its theoretical construct.

Table 1: Differences in Cognitive Preferences among School Principals According to Different Role Categories

Cognitive Preference Mode	Total		Administrative		Human Relation		Pedagogical		Medical School Teachers*	
	X	SD	X	SD	X	SD	X	SD	X	SD
R	2.68	.32	2.72	.43	2.62	.39	2.68	.45	2.47	.40
A	2.55	.24	2.45	.33	2.70	.30	2.52	.46	2.63	.47
Q	1.82	.44	1.90	.50	1.75	.51	1.78	.51	2.23	.50
P	2.93	.27	2.92	.34	2.91	.42	3.03	.38	2.67	.61

*Tamir and Cohen (1980)

Two major findings can be derived from this table. First, the strongest preference of school administrators is the Principle mode, most notably with regard to pedagogy. The higher Principle preference in pedagogical issues may be an indication that in such issues various statements are looked upon as value based principles to follow. This, of course, should be taken only as a suggestion for further investigation. The second important result is the low preference of Questioning, which implies the acceptance of information with relatively little critical consideration of its completeness, general validity or limitations. If this, indeed, reflects the way school administrators relate to information, the implication this has on those who translate information into action is far-reaching. It implies a situation in which information is considered normative knowledge, and highly unquestioned. It may be argued that if one does not question the validity of information, or does not approach it more critically, and stresses the importance of

information that is perceived to be close to one's fundamental principles or value system, such configuration would yield a conservative approach, which underscores continuity rather than change, indeed an interesting line to follow.

A striking result to be seen in Table 1 is the similar preference profiles found among school administrators and those of medical school teachers (Tamir and Cohen, 1980). In other studies dealing with adults, it turned out that science teachers were found to be "high P, Q, A, low R," and college students "medium R, P, low Q, high A" (Tamir, 1985, p. 8). Israeli students were found to have a mean score of P much higher than the other three scores (Rogel, 1974; Tamir, 1975). To what degree are the results influenced by the school administrators' background variables?

Background Variables and Cognitive Preferences

Generally speaking no significant differences were found among cognitive preferences according to the background variables. In an overall correlation coefficient matrix a few correlations were found statistically significant, as will be presented below. However, in computing so many intercorrelations this may be expected to occur by chance.

Since, in one of the few studies which reported gender differences, it was found that among high school students, "females possess a higher preference for P while males have a higher preference for Q and A" (Tamir, 1975, p. 245), it was interesting to notice some small differences in the gender category which were

statistically significant. In the overall analysis women tended to

score higher in the Principle cognitive preference than men, while in

the subtests analysis -- the pedagogical and the human relation

categories -- men scored higher in Application. No differences were

found in the administrative category. One wonders whether the

tendency for women to favor the Principle preference more than men

may be attributed to cultural or gender-related socialization. But,

again, this is far too early to address this issue which needs a more

direct study with different sampling.

Another finding is that school administrators with less

experience -- fewer years in administration -- tend to be higher in

Critical Questioning than older ones, particularly in the pedagogical

category. No difference was found between school principals and

other school administrators. But again, for all the differences,

since no real pattern has emerged in preferences, these findings

should be considered only as preliminary clues for further studies.

Because of the overall low correlations between background variables

and cognitive preferences, no regression or analysis of variance were

conducted.

Internal Structure of School Principals' Cognitive Preference

Table 2 presents the intercorrelations of the four preference

modes, again compared to those obtained in two other studies -- Kempa

and Dube (1973) and Tamir and Kempa (1977) who studied college

students -- and in the meta-analysis of 54 studies on cognitive

preferences (Tamir, 1985). The interpretation of the correlation

coefficients requires some caution, since, as Kempa and Dube (1973)
mentioned in their correlation analysis, "it must be realized that
the ipsative nature of the cognitive preference test would per se
result in a low negative correlation between scores in one area and
those in the remaining areas (for a random score distribution over
all areas, r-values of -.33 would be expected)" (p. 283). Hence, the
normal procedure of estimating significance levels cannot be applied
to the present correlation coefficients, and the proper approach will
be to consider the magnitude of the deviation from the expected
theoretical values (Tamir, 1975).

Table 2:   Inter-correlations of Scores in Cognitive
           Preferences (compared with other studies)
                        (N=134)

	R		A		Q	
Recall (R)						
Application (A)	-.17	(-.17*) (-.48**) (-.23***)				
Questioning (Q)	-.68	(-.71*) (-.55**) (-.63***)	-.31	(-.22*) (.24**) (-.15***)		
Principles (P)	.09	(-.44*) (-.09**) (-.07***)	-.18	(-.65*) (-.57**) (-.33***)	-.58	(.24*) (-.45**) (-.28***)

*   Kempa and Dube (1973)
**   Tamir and Kempa (1977)
*** Tamir's meta-analysis (1985)

It seems that two strong relationships exist among the four cognitive preference modes as measured in this study: Recall scores appear highly and negatively correlated with the Critical Questioning scores, as do Principles scores with those of Critical Questioning. We notice the Q-R negative correlation was found in all previous studies as well. The strong negative correlation between A-P which is found in several other studies is weaker, though, among the school administrators, and a new interrelationship of Q-P appears.

The relationships suggested by the correlation analysis were further examined by Varimax factor analysis of the cognitive preference scores. Kempa and Dube (1973) were the first to suggest that cognitive preferences are predominantly oriented along two, independent, bipolar axes, the Recall----Critical Questioning, and the Application----Fundamental Principles, which were termed as the Curiosity Scale and the Utilization Scale respectively. In this study only the first scale, the Curiosity Scale, as suggested by Kempa and Dube (1973), can be identified among the school administrators, and this scale is different since the pole opposite to Critical Questioning is loaded not only with R but also with P (see Table 3). If we apply this categorization to school principals' orientations toward information, one could argue for the distinction between a Challenging Scale and Acceptance Scale, or between the distinction of Change and Maintenance, something along the line of conservatism as discussed above.

school principals' role categories, an interesting picture was
revealed.   Again, because of the small number of items in each
category, the results should be interpreted cautiously (see Table 4).

Table 4:   Results of Varimax Factor Analysis of Cognitive
           Preference Scores According to Role Categories

	Administrative Category		Human Relation Category			Pedagogical Category		
	Factors		Factors			Factors		
	I	II	I	II	III	I	II	III
Recall (R)	.84	-.04	-.08	.99	-.12	.96	-.29	-.07
Application (A)	.14	.84	-.05	-.07	.99	-.19	.97	-.14
Questioning (Q)	-.97	.05	-.71	-.59	-.37	-.66	-.51	-.55
Principles (P)	.24	-.79	.98	-.15	-.16	-.02	-.14	.99
Percentage of Variance	43.8	32.2	41.0	30.1	28.8	41.8	33.1	25.1

It is still too early to develop a theoretical construct to
explain the differences of factors across the subtest categories,
although one is tempted to do so.   Nevertheless, some observations
can be presented.   The first and striking observation is the
appearance of the "classical" two bipolar axes, as was developed by
Kempa and Dube (1973),   the Recall----Critical Questioning and the
Application----Fundamental Principles, i.e., the Curiosity Scale and
the Utilization Scale in the Administrative category.   Second, the
Curiosity Scale appears in all categories, all of which might
strengthen the universality of this scale, on the one hand, and the
validity of the Management Cognitive Preference questionnaire, on the

school principals' role categories, an interesting picture was
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strengthen the universality of this scale, on the one hand, and the
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other. In relating these outcomes to those observed in Table 1, where the school administrators scored relatively high in Recall (R) and very low in Questioning (Q), which means that they do not seek to extend the initial information and they do not call explicitly or implicitly for the information to be questioned or extended beyond its original confines, one might suggest that school principals tend to be low in the Curiosity Scale, which supports the inference that school principals have a conservative approach to their work. It would be premature at this point to go beyond these basic observations.

Discussion

Caution should be used in any discussion of the results. As can be seen in the following table the reliability in some categories is low, and in the Application category it falls behind the general reliability of the commonly used student tests:

Table 5: <u>Alpha Cronbach Internal Consistency Coefficient</u>
<u>(as compared with other tests)</u>
N= number of items

Cognitive Preference Mode	Current test	Tamir and Kempa (1977)	Tamir and Cohen (1980)		Tamir's Meta-analysis (1985)	
	N=28	N=30	N=18	N=18	N=20 or less	N=21-40
R	.67	.78	.72	.55	.68	.75
P	.57	.58	.54	.51	.55	.67
Q	.85	.81	.71	.58	.57	.76
A	.38	.60	.68	.79	.61	.67

As mentioned above, without external validity the importance of reliability and of consistency in results are of major importance. Since this is the first study conducted with school administrators in a different subject matter, it was important to compare results to previous studies, even though they were focused on science.

It has been suggested (Tamir, 1975) that cognitive preference styles consist of three elements: first, a general characteristic of the individual, which may by itself consist of two components, an inherited component and a component acquired through experience; second, a broad discipline-related element, which was up to now reflected mostly in the natural sciences; and, third, a specific subject matter area. Consequently, the results of this study should be viewed with all three dimensions in mind.

The distribution of cognitive preferences obtained here is thus a function of individual differences according to personal characteristics and experience, and of the actual subject matter of the study. Furthermore, the differences revealed according to the various role categories of school administrators -- the pedagogical, the human relations, and the administrative -- strengthens the assumption of differences in cognitive preference occurring according to specific subject matter in the same disciplinary realm. Only with the accumulation of results of many studies may it be possible to differentiate the weight of the individual and the subject matter components.

To what degree do cognitive preferences reflect an inner pattern beyond individual and subject matter differences? The meta-analysis

of the last twenty years of studying cognitive preferences (Tamir, 1985) clearly shows interrelationships beyond individual differences and specific subject matter. Kempa and Dube (1973) have suggested a consistent inner pattern by assuming that "cognitive preferences are predominantly oriented along two independent bipolar axes : Recall----Critical Questioning, and Application----Fundamental Principle" (p. 287). Is this assumption, as well as the interrelationships revealed through the meta-analysis, consistent only with cognitive preferences in the realm of natural science? For the reliability of this study it is a critical question.

The finding of the Curiosity Scale (the Recall----Critical Questioning axis) in the total score analysis in this study and the appearance of the bipolar axes in the subtests analysis by different role category is thus of major importance for two reasons. First, it strengthens the validity of the questionnaire developed and employed in this study, and second, it lays down the theoretical ground that at least the Curiosity Scale is a basic cognitive preference attribute beyond disciplines. Since a high positive score on this scale (Q-R) assumes willingness to acquire more and to question existing knowledge, while a low score implies "intrinsic satisfaction with knowledge already gained" (Tamir, 1975, p. 245) it might be of great interest in understanding school principals' behavior. Given the current pressure to critically appraise the low rate of change in school organization and school practices (Cuban, 1984), this study might supply a different way of challenging the problem.

Summary

As an exploratory study this is only the beginning, a spring-board for studies to follow. It opens a new way of looking at the relationships between information processing and decision making, and perhaps offers a new and interesting insight into managerial behavior. There is still a long way to go.

There are many questions unanswered, for instance, to what degree are preferences in managerial issues reactions to specific sets of items, i.e., to a particular content, or do they represent a relatively stable style of cognitive behavior? Are there relationships between different modes of cognitive preferences and different processes of decision making, or types of solutions, and if so, what are they? Furthermore, do different cognitive preferences relate to different managerial behaviors? Is being high or low on the Curiosity Scale related to the differentiation between leadership and management (Inbar, 1987)? Are such differences related to different organizational climates? As may be seen, we are proposing here a clear agenda for future studies.

If, as has been shown previously in many studies, teaching might change students' cognitive preference profiles, this may have direct application to the development of new school principals' training programs, to be involved in professional development activities which would particularly challenge them to engage in critical questioning and inquiry. In our opinion the results of this exploratory study demonstrate the potential of this approach in understanding managerial information processing, and perhaps even management behavior, thus justifying encouragement to be given to studies in this direction.

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