

Cognitive Style and the Level of Cooperation Between the Library Media Specialist and Classroom Teacher

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National standards and guidelines established by the American Library Association and the American Association of School Librarians set high expectations for cooperation between school library media specialists and classroom teachers.(1) More than 75,000 school library media specialists in the United States are expected to work with all teachers in their schools to identify materials for use in teaching situations and to integrate library media, research, and study skills into every classroom curriculum. Are these, in fact, realistic expectations?

Many factors affect how well school library media specialists and classroom teachers cooperate. Not the least of the factors is the set of operating perceptions. The manner in which an individual's perception is influenced by sensory data is often called "cognitive style." Cognitive styles are the ways in which individuals think and order their environments, the sensory preferences of individuals, and the way in which individuals formulate and communicate ideas. Individuals usually have a tendency toward particular cognitive styles. Various cognitive styles have been identified, measured, and shown to affect the manner in which individuals perceive their environments. Such styles include field dependence or field independence; scanning; breadth of categorization; conceptualizing styles; cognitive complexity or simplicity; reflectiveness or impulsivity; leveling or sharpening; constricted or flexible control; and tolerance for incongruous or unrealistic experiences.(2)

Field independence and field dependence as defined by Witkin and others are related to those characteristics of individual functioning that surface in social, intellectual, and perceptual domains of human behavior.(3) Studies by Witkin and Goodenough identify a continuum of various characteristics of field-independent and field-dependent individuals.(4) For example, field-independent individuals perceive objects as separate from the field, abstract figures from a field, impose personal structures on the environment, set self-defined goals, work alone, choose to deal with abstract subject matter, are socially detached and rely on their own values, and are self-reinforcing.

In contrast, field-dependent people tend to rely on the field for clues about an object, prefer a structure provided by the environment, experience the environment more globally, are interested in people, use externally defined goals, receive reinforcement from others, focus on socially oriented subject matter, and prefer to work with others.

Such differences in this aspect of cognitive style may relate to perceptions of the library media program. Because field independent people may use their own internal skills to structure their environments and field-dependent people rely more heavily on social or environmental cues, these differences may affect the way in which individuals perceive and interact with each other. These two aspects of field dependence and independence may make a major difference in the interaction between individuals who teach together. Other variables found to be related to field independence and field dependence include age, sex, achievement, and career selection.

Cognitive style (field independence and field dependence) may be related to the way in which a library media specialist and teacher work together. A study by Saracho on teachers and students who were matched and mismatched in regard to field independence and field dependence showed that field-independent and field-dependent teachers differed significantly in their perception of student ability.(5) While both field-independent and field dependent teachers ranked students who matched their own field dependency/independency close to the students' actual standardized achievement score rankings, field-dependent teachers tended to have greater negative discrepancy scores in ranking field-independent (i.e., mismatched) students. When Saracho and Dayton examined the relationship of teachers' cognitive styles and pupils' academic achievement gains, they found that students of field-independent teachers showed higher academic gains than students of field dependent teachers.(6) Thus, there appears to be a relationship between field independence/dependence and achievement or the perception of achievement.

Cooperation between the library media specialist and the classroom teacher is very significant in library, media, research, and study skills instruction. Investigations suggest that the level of cooperation between the library media specialist and the classroom teacher is related to the perception of the role of the library media specialist in the instruction of students. Mohajerin and Smith developed a survey to measure perception of the library media specialist's role and studied the perceptual differences between various educational groups.(7) No significant conflicting perceptions were found between the principal and library media specialist, but differences were found between library media specialists, teachers, and other educators. These differences in perception of the level of involvement in instruction by the library media specialist also have been shown by Corwin, Cox, Lombard, Pemberton and Smith, and Cantor.(8)

Stroud and Loertscher examined the services offered by the school library media program and measured the differences in perceptions of teachers, library media specialists, and students.(9) Discrepancies in the perceptions of these groups were revealed. Services identified by library media specialists were found to be teacher oriented, although classroom teachers often were unaware of the available services.

Because national and many state guidelines and standards recommend that library media skills be taught cooperatively by the classroom teacher and the library media specialist for maximum instructional effectiveness, the cognitive styles of the classroom teacher and the library media specialist may have an effect on the students' library media skills achievement. If library media skills instruction is done cooperatively, the perception of student achievement as well as the perception of the instructional partner's teaching ability might be related to differing cognitive styles. In fact, many of the characteristics of cognitive style relate to Herrin, Pointon, and

Russell's list of the characteristics of library media specialists who operate successful programs.(10) The level of involvement in library media skills instruction may therefore be related to the cognitive styles of the classroom teacher and library media specialist.

The level of involvement of the school library media specialist in curriculum development was studied by Loertscher and Land,(11) and Loertscher,(12) who developed a taxonomy that classifies the levels of involvement of library media specialists in instructional design and curriculum development. This taxonomy was used to develop a series of instruments for principals, classroom teachers, and students to assess the perceived involvement of the library media specialist in the school's overall educational program.(13) The taxonomy provides a method for measuring at least nine levels of the library media specialist's curriculum involvement, ranging from no involvement at all to complete team-teaching with classroom teachers. The nine levels listed in the taxonomy have been used to evaluate how much cooperation occurs between the library media specialist and the classroom teacher and how they work as a team in teaching library skills in combination with classroom curriculum.

Assuming that field independence and field dependence are elements of cognitive style, that classroom teachers and library media specialists differ in their perceptions of library media services, and that a match or mismatch in cognitive style (field dependence/field independence) affects perceptions of ability and achievement, the major research question in the present study was as follows: What is the relationship between matches and mismatches in the cognitive styles (field dependence/field independence) of library media specialists and classroom teachers and their perceptions of the level of cooperation in planning and teaching library media skills?

Specific questions related to the main question were: How is the field dependence/ field independence of the library media specialist and the classroom teacher related to the perception of each regarding who provides more direct library media skills instruction? How is the field dependence/field independence of library media specialist and classroom teacher related to the perceived amount of time spent planning for cooperative library media skill instruction? How is the field dependence/field independence of the library media specialist and the classroom teacher related to the perceived level of cooperation in teaching library media skills? How is the field dependence/field independence of the library media specialist and classroom teacher related to the chosen method for teaching library media skills cooperatively?

Methodology

A total population of ninety-two female elementary school library media specialists in one large suburban school system, using a single library media skills curriculum, and working under a single personnel evaluation system, were invited to be tested using the Group Embedded Figures Test (GEFF) developed by Oltman, Raskin, and Witkin to measure the field independence/dependence of individuals.(14) The test is designed for timed group administration and requires individuals to locate a figure embedded within another figure.

Forty volunteers who scored in the upper or lower third of the test and top or bottom quartile of the test were selected. Each library media specialist worked in one elementary school with a number of teachers. In each school, all teachers were asked to participate voluntarily in the study.

They were selected to participate based on their scores on the GEF. If the teachers scored in the extreme upper or lower third of the GEF and top or bottom quartile of the GEFT, they were part of the study. Ten field-independent library media specialists were matched with ten field-independent classroom teachers; ten field-independent library media specialists were matched with ten field-dependent classroom teachers; ten field-dependent library media specialists were matched with ten field-dependent classroom teachers; and ten field-dependent library media specialists were matched with ten field-independent classroom teachers. Thus, dyads (one library media specialist and one classroom teacher) were established so that one half of the dyads (twenty) were matched in cognitive style and the other half (twenty) were mismatched (see table 1).

Table 1. Cognitive Style Dyads

Field Independent LMS (10)	Field Independent LMS (10)
Field Independent CT (10)	Field Independent CT (10)
Field Dependent LMS (10)	Field Dependent LMS (10)
Field Dependent CT (10)	Field Dependent CT (10)

LMS=Library Media Specialist, CT=Classroom Teacher

Each dyad was given *A Self-Evaluation Checklist for the Taxonomy of Teacher Uses of the Library Media Center Staff and Services* developed by David Loertscher, which measures perception of involvement in instruction, time spent providing instruction (number of units planned cooperatively), and level of commitment to library media skills instruction.(15) The checklist was modified and validated for the purpose of this study. The modified checklist was submitted to a panel of eleven experts in the library media and education community, who completed the instrument and retested it after a two-week interval. Reliability was .71. A split-halves model for testing reliability also was used on the survey data results. The computed score for the Spearman Brown reliability formula was .73.

Means, standard deviations, variation, and range were calculated for each survey item on *A Self-Evaluation Checklist for the Taxonomy of Teacher Uses of the Library Media Center Staff and Services*. The fifty-two survey items were grouped to correspond with the main research question and four subquestions. The items related to the main question and each subquestion were examined as a group using a repeated-measures multivariate analysis of variance as well as a univariate analysis of variance. The dyad scores of the library media specialists' and classroom teachers' responses were used as the dependent variable, whereas cognitive style and the match or mismatch of cognitive style were used as independent variables. The library media specialists' scores were used as the unit against which the classroom teachers' responses were compared. A Linivariate method of hypothesis testing also was used because of the small sample size. Significance of F was measured at the $p < .05$ level. Reliability was tested using a split-halves model.

Findings

A repeated-measures multivariate analysis of variance test was performed using the data related to the four subquestions. Statistical differences of effects were measured both among all subjects and within subject groups (i.e., individuals by job types, matched and mismatched cognitive styles by individuals, and cognitive style by individual). Wilks' Lambda test showed no statistically significant differences of effects among subjects with matched and mismatched cognitive style, or type of cognitive style by match or mismatch. Wilks' Lambda showed statistically significant differences at $p < .05$ for cognitive style of subjects as an effect on the perception of library media specialists of their level of cooperation when planning and teaching library media skills. There were no statistically significant differences for effects *within* subject groups (see table 2).

Table 2. Repeated Measures Multivariate Analysis of Variance Summary Table of Results Related to the Relationship Between Cognitive Style Matches and Mismatches of Library Media Specialists and Classroom Teachers and Their Perception of the Level of Cooperation in Planning and Teaching Library Media Skills

Source	Value	Approximate F	Hypothesis DF	Error DF	Significance of F
Among Subjects' Effects					
Cognitive style	.67043	4.05544	4.0	33.0	.009
Match/mismatch	.91126	.80335	4.0	33.0	.532
Cognitive style by match/mismatch	.94807	.45188	4.0	33.0	.770
Within Subjects' Effects					
Individual	.79478	2.13024	4.0	33.0	.099
Match/mismatch by individual	.91212	.79490	4.0	33.0	.537
Cognitive style by individual	.87859	1.14007	4.0	33.0	.355
Cognitive style by match/mismatch by individual	.95978	.34568	4.0	33.0	.845

The cognitive style of the library media specialist was shown to be statistically significant when using the library media specialists' responses as the dependent variable. No other independent variables were shown to be statistically significant for effects among or within subjects. Results for the four subquestions which included direct instruction, planning time, level of cooperation, and strategies and materials were grouped and tested using a univariate analysis of variance.

Four subquestions related to the main question were investigated as part of the study. Data related to the four subquestions were examined using univariate F statistical tests. Results of the univariate F tests provided significant results at $p < .05$ for two of the areas of investigation. First, the results were significant for cognitive style of the subject in relation to the perception of time spent planning for cooperative library media skills instruction. Results of the univariate analysis of variance test are reported in table 3.

Table 3. Source of Variation Between Library Media Specialists' (LMS) and Classroom Teachers' (CT) Responses Concerning the Amount of Time Spent for Planning for Joint Instruction and Cognitive Style

Source	df	Sum of Squares	Mean Square	Univariate F	Significance of F
Among Subjects' Effects					
Cognitive style (FI/FD)	1	708.050	708.050	9.59381	.004
Match/mismatch	1	0	0	0	1.000
Cognitive style (FI/FD) by match/mismatch	1	4.050	4.050	.05488	.816
Error	36	2656.900	2656.900	—	—
Within Subjects' Effects					
Individual LMS/CT)	1	57.800	57.800	1.99291	.167
Match/mismatch by individual (LMS/CT)	1	.800	.800	.02758	.869
Cognitive style (FI/FD) by individual (LMS/CT)	1	84.050	84.050	2.89800	.097
Cognitive style (FI/FD) by match/mismatch by individual (LMS/CT)	1	1.250	1.250	.04310	.837
Error	36	1062.900	29.525	—	—

The scores of the classroom teachers were compared to the scores of the library media specialists. Because the cognitive style of the individuals was statistically significant, the library media specialists' and the classroom teachers' responses were analyzed for cell means and standard deviations. The library media specialists grouped by cognitive style showed differences

in their responses to the items related to the amount of time spent planning for joint instruction. Distribution results are reported in table 4.

Table 4. Means and Standard Deviations for Field-Independent and Field-Dependent Library media Specialist's Responses to Items Related to the Question about the Amount of Time Spent Planning for Joint Instruction and Cognitive Style

	Means	SD
Field Independent (FI)	17.600	5.292
Field Dependent (FD)	25.600	7.522

Statistical significance at $p < .05$ was also found for cognitive style of the subject and the perceived level of cooperation in teaching library media skills. Results of the univariate test are reported in table 5.

Table 5. Source of Variation Between Library Media Specialists' (LMS) and Classroom Teachers' (CT) Responses Concerning the Perception of the Level of Cooperation and Cognitive Style

Source	df	Sum of Squares	Mean Square	Univariate F	Significance of F
Among Subjects' Effects					
Cognitive style (FI/FD)	1	143.1125	143.1125	5.96544	.020
Match/mismatch	1	2.1125	2.1125	.08806	.768
Cognitive style (FI/FD) by match/mismatch	1	13.6125	13.6125	.56742	.456
Error	36	863.6500	23.9902	—	—
Within Subjects' Effects					
Individual LMS/CT)	1	25.3125	25.3125	1.16879	.287
Match/mismatch by individual (LMS/CT)	1	23.1125	23.1125	1.06721	.308
Cognitive style (FI/FD) by individual (LMS/CT)	1	56.1125	56.1125	2.59097	.116
Cognitive style (FI/FD) by	1	15.3125	15.3125	.70705	.406

match/mismatch by individual (LMS/CT)					
Error	36	1062.900	29.52	—	—

The evaluation instrument scores of the classroom teachers were compared to the scores of the library media specialists. Because the cognitive style of the individuals was statistically significant, the library media specialists' and the classroom teachers' responses were analyzed for cell means and standard deviations. The library media specialists grouped by cognitive style showed differences in their responses to the items related to their perception of the level of cooperation when teaching. Distribution results are reported in table 6.

Table 6. Means and Standard Deviations for Field-Independent and Field-Dependent Library media Specialist's Responses to Items Related to the Question about the Perception of the Level of Cooperation and Cognitive Style

	Means	SD
Field Independent (FI)	7.900	3.697
Field Dependent (FD)	12.250	4.374

Conclusions and Recommendations

The results of the study suggest that the cognitive style of the library media specialist makes a difference in response to questions about working together with teachers when teaching library media skills. Because the match or mismatch in cognitive style was not found to be statistically significant, cognitive style of the library media specialist may be more important than the match or mismatch of cognitive style in pairs of library media specialists and teachers working together. This finding supports those of Saracho, Saracho and Dayton, Saracho and Spodek, and Saracho, who found that the cognitive style of classroom teachers makes a difference in student learning, and that the cognitive style of the classroom teacher makes a greater difference in student learning than the match or mismatch of style between classroom teachers and students.(16) In this study, the data provide further support for the notion that there are effects among subjects related to cognitive style.

The cognitive style of the library media specialists and classroom teachers in relation to the amount of time spent planning together for cooperative instruction had a significant effect among subjects. No studies were found that examine the relationship of time perception and cognitive style. Definitions and descriptions of general characteristics of cognitive style (field independence and field dependence) do not include information about time perception; however,

the definition encompasses ways in which a person structures the environment. The measure of time used in this survey was the number of cooperative instructional units. This measure might be seen as a structural device for organizing an environment.(17)

Mean scores for field-dependent library media specialists were higher than those of the field-independent library media specialists. The higher means corresponded with a perception of field-dependent specialists of more units planned cooperatively. Since field-dependent people are generally characterized as more social than field-independent people, this finding is consistent with the characteristics of field dependence.(18)

The data related to library media specialists' and classroom teachers' perceived level of cooperation when teaching library media skills showed statistical significance for cognitive style of the subjects. This finding appears to support studies of communication and group performance. In the present study, cognitive style was related to perception of cooperation. This supports other studies related to cognitive style and cooperation within groups. For example, Oltman and others found that groups with field-dependent members are more effective in conflict resolution than groups without field-dependent members.(19) DiBiasio found that mixed groups form coalitions.(20) Field dependence appears to make a difference in relation to cooperation.

Mean scores of the field-dependent library media specialists were found to be higher than those for the field-independent library media specialists. Higher means corresponded with a perception of greater cooperative efforts. These scores support the characterization of field dependent people as more social than field independent people.(21)

A large body of knowledge related to field independence and field dependence has accumulated during the past forty years. Beginning with the work of Witkin, a definition and theoretical constructs of field independence and field dependence have been outlined and refined. The present study sought to test some of the assumptions about this aspect of cognitive style in a related educational field of study-library media-to see if the theory is applicable. Cognitive style was found to have a statistically significant effect on the responses of library media specialists and classroom teachers in relation to perception of the level of cooperation when teaching library media skills.

For the researcher, this study examined another aspect of the field-independence and field-dependence element of cognitive style in terms of perceptions of direct instruction, planning time, cooperation, and instructional strategies. Earlier research on the relationship between cognitive style and student and teacher achievement suggested that cognitive style of teachers is related positively to student achievement.(22) The results related to perceived level of cooperation reported herein suggest further examination. For example, what elements of cooperation are affected by cognitive style? Cooperation assumes a willingness to accept the goals and objectives of others. What is the relationship between this behavioral characteristic and cognitive style? What is the relationship between cognitive style, perception of cooperation, and level of motivation in performing library media functions? How are these relationships related to other groups of subjects with whom the library media specialist must interact (e.g., the principal, reading teacher, students, staff, and parents)?

Implications for Researchers

The implications of the present study suggest many avenues for further research. Given the statistically significant effect of the library media specialists' cognitive style on perception of planning time and cooperation, further research on how cognitive style is related to effective instructional relationships between library media specialists and classroom teachers is certainly indicated. Such research might include the use of case studies to explore how cooperation differs between field independent and field-dependent library media specialists and classroom teachers. Such approaches might investigate how time is perceived by these cognitive-style extremes. Is there a direct relationship between field independence and field dependence and an individual's sense of time or time-bound relationships?

The present study was limited to an examination of cognitive style in the relationship between library media specialists and classroom teachers. The effects of cognitive style on the relationship between principals and library media specialists is equally important because of the strong influence of the principal on the school environment. This warrants future study.

A validated instrument for quantifying instructional relationships in the library media field would be of great service to practitioners and to researchers. Such an instrument would be useful in defining the instructional role and in establishing standardized baseline data for the profession. For example, the practitioner might use it for self-evaluation or for school level evaluation of the role of the library media specialist in the overall instructional program. On the other hand, researchers might collect and analyze data that contribute to a better understanding of instructional roles in library media centers.

Implications for Practitioners

Knowledge and awareness of cognitive style may be useful to individuals for purposes of self-management. By knowing one's own style, one can expand on its strengths and learn techniques for mitigating the negative aspects or weaknesses. If one knows that one has a tendency toward extreme field dependence, one can learn methods for structuring one's environment with such devices as outlines, time lines, and questioning techniques. Practicing library media specialists and classroom teachers may use tests to identify personal cognitive style, which may foster insight into the general reasons for certain behaviors among staff members and contribute to mutual respect.

Finally, schools of higher education- colleges both of education and of library science-might use cognitive-style instruments in general and career counseling. If cognitive style truly affects perceived instructional interactions, knowledge of personal style might be of real benefit in making initial career choices.

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