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Perceptual Modality Preference Effect of Student Performance

Terry J. Castle
The College at Brockport

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PERCEPTUAL MODALITY PREFERENCE

EFFECT ON STUDENT PERFORMANCE

THESIS

Submitted to the Graduate Committee of the
Department of Curriculum and Human Development
State University College at Brockport
in Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Education

by

Terry J. Castle

State University College at Brockport

Brockport, New York

SUBMITTED BY:

Jerry J. Castle

APPROVED BY:

W. R. Smith 10.24.86
Thesis Advisor Date

Robert B. Pille 11/26/86
Second Faculty Reader Date

Robert B. Pille 11/26/86
Chairman, Graduate Policies Committee Date

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ABSTRACT

Past research indicates that a person's individual learning style is unique. Certain interactions take place in the classroom that occur as a result of student's and teacher's learning styles and these interactions can have an effect on how well a student learns. Some researchers have suggested that matching students' learning styles with complementary teaching styles can have a positive, significant effect on student performance or achievement.

The purpose of this study was to investigate the premise that students and teachers whose styles matched would be reflected on student performance. Student performance in this study was measured by students' grade point averages. The intent was to determine if students with a visual or auditory perceptual preference, taught by a teacher with a similar perceptual modality preference, would have higher grade point averages than students who did not exhibit the same perceptual modality preference as their teachers.

The Learning Styles Inventory by Jerry F. Brown and Richard M. Cooper was the diagnostic instrument administered to both the teachers and the students in this study to determine their perceptual modality preferences. Four

teachers and 96 students were the population for this study. Students who matched or mismatched their teachers according to perceptual modality preference was determined by giving students and teachers the inventory lists in the appendices. The researcher was also provided with all the grade point averages of the students who participated in the study and the mean of the four grade point averages for the 1985-1986 school year was determined. It was hypothesized that students with a visual or auditory perceptual preference taught by a teacher with a similar preference would have a higher grade point average than students whose preferences do not match their teachers.

Results indicated that students with a perceptual modality preference similar to their teachers' preferences did not have higher grade point averages than students who mismatched their teachers.

Student performance did not differ between students whose perceptual modality preferences matched or mismatched their teachers as measured by grade point averages. Students apparently adapt to different instructional techniques and materials that require the use of different perceptual modalities despite their stronger preference.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Statement of the Problem	1
Purpose of the Study	2
Definitions	2
II. REVIEW OF RELATED LITERATURE	5
Academic Performance, Achievement, and Grades	5
Students' Perceptual Modality Preference and Performance	8
Factors of Perceptual Modality Preferences and Achievement	12
Matching Students' and Teachers' Styles	14
Style as a Unidimensional or Multidimensional Approach	15
III. METHODOLOGY	18
Research Design	18
Selection and Content of the Learning Styles Inventory	18
Presenting the Experiment to the Teachers	19
Evaluation of the Teachers	19
Presenting the Experiment to the Students	19
Evaluation of the Students	20
Hypotheses	21

Chapter	Page
IV. RESULTS	22
Teachers Visual and Auditory Scores . . .	22
Influence of Teacher Preference on Student Preference	24
Relationship Between Teachers' and Students' Perceptual Modality Preferences	26
The Grade Averages of Students Whose Preferences Matched Those of their Teachers	28
The Grade Averages of Students Whose Preference Matched or Mismatched the Preferences of their Teachers . . .	30
V. SUMMARY AND CONCLUSIONS	32
Summary of Results	33
Limitations on the Study	34
BIBLIOGRAPHY	37
APPENDICES	41
A. Learning Styles Inventory	42
B. Learning Styles Inventory Printout Information	44

LIST OF TABLES

Table	Page
1. Teachers' Learning Styles Inventory Scores	23
2. Individual Teachers and their Students' Perceptual Modality Preferences	25
3. Grouped Teachers and their Students' Perceptual Modality Preferences	27
4. Number of Matched Students and their Grade Category	29
5. Grade Averages of Students Who Matched and Mismatched Teachers	31

CHAPTER I

INTRODUCTION

Statement of the Problem

Physically, psychologically, and emotionally no two people are alike. Yet, in schools, most of the time students are expected to learn under the same conditions by use of the same techniques. However, research indicates that everyone learns in ways that are unique to that individual. The environmental, physical, sociological, psychological, and emotional conditions which affect the way a person learns and performs is called learning style, and may have a bearing on students' performance and attitudes about school and themselves.

Students are not the only actors in the classroom to exhibit individual learning styles. Teachers' learning styles can have an effect on the teaching styles used in the classroom. Research indicates that in some cases matching students and teachers with similar learning style preferences, or matching students with the environment or techniques that best suit their learning styles, can have a positive effect on student performance. Other studies on matching have not reported significant results on student performance or achievement.

Purpose of the Study

This research study explored the effect on student performance when students' learning styles matched the learning styles of their teachers. The perceptual modality preference of both students and teachers was the element of learning style chosen for investigation in this study.

The intent of this researcher was to determine if students with a particular perceptual modality preference who were taught by a teacher with a similar perceptual modality preference would have higher grade averages than students who did not share their teacher's perceptual modality preference.

Definitions

In this study, the students' grade point averages were used as a measure of performance. The assumption was also made that teachers tend to teach in a style that is similar to their learning style.

The following definitions were operant for this study.

Learning style as defined by Hunt (1979) states that this concept "describes a student in terms of those educational conditions under which he is most likely to learn" (p. 27). Dunn (1983) observes learning styles as

"the way individuals concentrate on, absorb, and retain new or difficult information or skills" (p. 496).

Therefore, learning style consists of the ways in which a person learns best and the conditions under which a person optimally performs. Dunn (1984) indicated there are twenty-one elements of learning style that interact to affect the way a person learns. This does not necessarily mean that every person will be affected by all twenty-one elements. One person will have particular elements that contribute to his or her learning style that may not affect someone else's learning style.

According to Messick (1978), cognitive styles are "conceptualized as stable attitudes, preferences, or habitual strategies determining a person's typical modes of perceiving, remembering, thinking, and problem solving" (p. 5). Keefe (1982) says that "each learner has preferred ways of perception, organization, and retention that are distinctive and consistent. These characteristic differences are called cognitive styles" (p. 45).

Cognitive style will differ from person to person as does learning style, and students will have particular preferences for environmental conditions when learning as a result of their cognitive styles. Although

similarities may appear between the definitions of learning style and cognitive style, both concepts tend to relate to how a person learns best. Keefe (1979), as cited by Hyman and Rosoff (1984), made the observation that the terms learning style and cognitive style are often used in the same context to mean the same thing but states that "learning style, in fact, is the broader term and includes cognitive along with affective and physiological styles" (p. 37). Dunn, Dunn, and Price (1979) seem to agree with Keefe in the belief that cognitive style is part of learning style when they state their belief that cognitive style is "one subcategory of learning style- the psychological component" (p. 54).

Perceptual modality preferences according to Keefe (1982) "describe learner tendency to use different sensory modes to understand experience" (p. 45). These sensory modes include visual, auditory, tactile and kinesthetic as identified by the Dunn's (1978). Some people exhibit a definite preference for a particular perceptual modality while others do not and will prefer to use a few or all of these perceptual modalities.

This study will focus only on perceptual modality preferences. Is it the matching of perceptual modality preference that contributes to the academic achievement of students?

CHAPTER II

REVIEW OF RELATED LITERATURE

Academic Performance, Achievement, and Grades

The assumption was made that grade point averages are a measure of academic performance or achievement. Many researchers in their studies on learning styles or cognitive styles have used the achievement of students as a measure of whether or not students gain from being taught through methods that are congruent with their preferred learning styles. Other investigators, such as Eiszler (1983), have used grades or grade point averages as an indication of student performance. This study reflects the same choice for determining academic performance.

When using grade point averages as a measure of academic performance, several characteristics of grading and learning performance need to be considered. According to Sperry (1972), "learning style, instructional style, and expectations are three factors that can influence learning performance" (p.6). Sperry says that how a student learns best, what methods a teacher uses in the classroom, and the expectations of the teacher as well as those of the student will have an effect on a student's learning performance.

Lavin (1965) reports similar information concerning the influences on learning performance. He states "positive attitudes toward school, such as beliefs in the value of intellectual pursuit and of education in general, are positively related to academic performance" (Lavin, 1965, pp. 68-69), and that student attitudes, expectations, and success in school are closely related. Concerning these three factors, a cycle can develop which perpetuates itself that will undoubtedly have an effect on student performance, achievement, and grades. If a student exhibits positive attitudes toward school, a teacher may then have higher expectations for that particular student than for a student who has more negative attitudes. Academic performance and grades may then be higher for the student who exhibits the more positive attitudes in combination with sensing the teacher's higher expectations which is a result of the student's attitude and subsequent performance. On the other hand, the student whose teacher does not have high expectations for him or her, as a result of the student's negative attitudes about school, may not perform as well academically as a consequence of the student's attitudes and the teacher's expectations.

Lavin (1965) found that subjective criteria enters into the grading process and says "certain characteristics

of the student, such as his sex and social class background, affect the quality of the relationship between the student and the teacher" (p. 20). A teacher cannot be completely objective in many of the items that he or she grades; subjectivity works its way into a teacher's system of grading. One of those areas of subjectivity might be perceptual modality preference.

Studies have been done on various determinants of grades. Battle (1957), as cited by Lavin (1965), found "students whose value patterns were closer to the teacher's ideal would have higher grades than students whose patterns diverged more from the teacher's ideal" (p. 139).

In a study conducted by Carter (1953), as cited by Lavin (1965), the sex of the student was a factor in the grading process. Carter found that male high school algebra teachers gave male students higher grades than female students, while no differences were reported between the grades of male and female students taught by female algebra teachers.

Lavin (1965) explains that there are "uncontrollable sources of variation in grades themselves" (p. 19). Different criteria are used by teachers when giving a grade to a student. He suggests that the assignments teachers consider more important than others varies from

one teacher to the next which can have a definite effect on students' grades.

As Sperry (1972) and Lavin (1965) have shown, teacher attitudes, student attitudes, and the day to day interactions between both teachers and students need to be considered when discussing grades as a measure of student or academic performance. Therefore, many elements, direct and indirect, help determine a student's grade. If in fact they do, and the evidence is strong, then perhaps another subtle influence on grades is perceptual modality preference. When teachers are cognizant of these influences, then they can counteract them. Or, student achievement could be raised if student and teacher were matched.

Students' Perceptual Modality Preferences and Performance

Perceptual modality preference on the part of the student has been the topic of research conducted mainly at the elementary school level, based on the assumption that utilizing teaching methods consonant with students' preferred perceptual modalities will result in higher academic performance or achievement. The concern of this researcher was whether or not this same assumption made by those researching at the elementary school level

could be made at the secondary school level. This researcher can find only a limited amount of research directly related to perceptual modality preference at the secondary school level.

A limited amount of research at the elementary school level concerning using teaching methods complementary to students' perceptual modality preferences reports positive findings. Daniel and Tacker (1974) concluded that "a child's preference for modality of stimulus input is an important variable which influences learning" (p. 257). These researchers found that positive results on achievement resulted when students were taught through their preferred perceptual modalities.

Carbo (1980), as cited by Dunn (1983), found that when students are taught in a manner consonant with their strongest perceptual modalities, students learn more easily and have better retention abilities. Findings similar to Carbo were discovered by Urbschat (1977), as cited by Dunn (1983), but he also found that visual presentation was preferred by most of the subjects regardless of their perceptual preferences. This finding raised the question of why the majority of students preferred a visual method of presentation even if it was not compatible with their preference. Perhaps the visual method was the one used most by teachers and, therefore,

the students were more used to it and felt more comfortable with it. This raised an interesting question as to whether or not students at the secondary level would also prefer a visual method of presentation even though they may prefer another perceptual modality.

Most of the research at the elementary school level found results that were not significant in regards to teaching students through methods that match their perceptual modality preferences. These findings were intriguing because it seems logical that a student would perform better if the methods and materials were complementary to his or her preferred perceptual modality.

Waugh (1973) found that there was "no interaction nor any statistical significance between the performances or groups of auditory and visual subjects" (p. 469). These findings led Waugh to conclude that the data from his study did not support the premise that "certain children have a preferred modality that facilitates recall and recognition of words" (p. 469). Translating this into a secondary school context, it became a cause of concern if the same could be true of secondary students. Would the results of this researcher's study show that grade point average is not influenced by complementary methods and materials and students' preferred modality preferences?

Similar findings by Robinson (1972) lend support to the conclusions of Waugh (1973). Robinson concluded that "neither a phonic or a sight method of teaching reading proved to be significantly more effective with children who exhibited the most marked differences in visual or auditory modalities" (p. 35). These results were interesting as Daniel and Tacker (1974), Carbo (1980), and Urbschat (1977) found completely different results in their studies. This researcher began to question what elements influenced positive results in some studies and negative results in others.

Miller's (1974) findings lend support to those of Waugh (1973) and Robinson (1972). Miller stated that "no relationships were demonstrated between either the components or total modality-preference scores and word recognition scores regardless of the method employed in teaching" (p. 1355-A).

The results of studies conducted by Freer (1972) and Schleif (1970) also support the premise that there is no interaction between method and modality. However, both researchers discovered that both visual and auditory learners learned better by the visual method than through any other method. Could the reason for this be that perhaps the visual method was preferred by both visual

and auditory students as suggested by Urbschat (1977) and, therefore, the students learned better?

These studies have raised the question as to whether these findings would also be found at the secondary school level. This researcher questioned the possibility that perhaps the age of the students may have an effect on the results of the study. Perhaps secondary school students taught in a manner that was compatible to their preferred perceptual modality would have higher grade point averages. Would there be a significant method-material-modality interaction at the secondary level? This was the concern of this researcher.

Factors of Perceptual Modality Preference and Achievement

The Dunn's (1978) have identified four perceptual modalities that contribute to a person's learning style. These are the visual, auditory, tactile, and kinesthetic modalities. Eiszler (1983), in a study conducted using ninth graders, suggested that the perceptual modalities identified by the Dunn's may not actually be what these students exhibited. He found that there are actually ten factors within the visual, auditory, tactile, and kinesthetic modalities. Eiszler concluded that "as an aspect of the learning style of adolescents, modality preference is a complex phenomenon and not adequately or

accurately expressed in terms of four equally important categories" (p. 236). This research has contributed to the refinement of what we know about learning styles.

Eiszler (1983) looked at these ten factors of perceptual modality and their effects on achievement. He found that the two factors "shown to be significantly related to achievement (as represented by grade-point average) were aspects of a visual preference" (p. 238). The factors of the visual modality preference were preferred by both high and low achieving students.

Marcus (1979) reported similar results regarding perceptual modality preference and achievement. From his study on seventh graders, Marcus found that "only one student in the 'below-average' group responded to 'auditory' as a preferred learning style, compared with 29 percent in the 'average' group, and 37 percent in the 'above-average' class" (p. 380). What Marcus is suggesting is that perhaps "below-average" students are being taught many times through auditory means which may not be the preference of many of these students. This may then have an effect on how much success this particular group is experiencing in the classroom.

As both Eiszler (1983) and Marcus (1979) have shown through their research, low achieving students seem to prefer factors of the visual preference.

Matching Students' and Teachers' Styles

The assumption is being made that a teacher's individual learning style can influence his or her teaching style. The Dunn's (1979a) believe that "teachers teach the way they learned" (p. 241). Therefore, the techniques, methods, and materials utilized by a teacher may very well coordinate with his or her own learning style.

Fischer and Fischer (1979) view teaching style differently than the Dunn's (1979a). They do not equate teaching style with a teacher's method of instruction. Rather, they view it as "a classroom mode, a pervasive way of approaching the learners, that might be consistent with several methods of teaching. Two teachers may use the same method of instruction but still differ indentifiably from each other" (p. 251). Fischer and Fischer also suggest that individuals do not exhibit purely one learning style or teaching style, but rather what occurs is a blending of several styles.

In accordance with matching learning style and teaching style and the subsequent influence on achievement, the Dunn's (1979a) expressed the belief that "a student's perceptual strengths and weaknesses are extremely important, for no matter how motivated a youngster might be, inability to absorb and retain through an inappropriate

sense tends to dampen motivation and, certainly, inhibits achievement" (p. 244).

Farr (1971), as cited by the Dunn's (1979a), states that "extensive observations and research verify significant improvement in both student achievement and motivation when learning and teaching styles are matched" (p. 242). Good and Stipek (1983) support Farr's findings in their belief that "students tend to achieve more in subject matter areas that are compatible with their cognitive styles" (p. 34).

Copenhaver (1979), as cited by Dunn (1983), also discovered in his study of high school students that when students' styles were similar to their teachers' styles, the students exhibited more positive attitudes. Therefore, this could have an effect on students performance.

Style as a Unidimensional or Multidimensional Approach

The issue of whether or not it is sufficient enough to judge academic achievement or performance on the basis of one dimension of learning style as compared to a multidimensional approach has been suggested by Letteri (1980). He proposes that by using a multidimensional approach it is possible to get an "analysis of the dynamic interrelationship among the seven dimensions of the cognitive profile to accurately

predict levels of academic achievement and, perhaps, identify specific learning deficits" (pp. 197-198).

Doyle and Rutherford (1984) also believe "there is little reason to expect that one dimension of learners, such as style will account for a large amount of variance in achievement" (p. 24).

Good and Stipek (1983) agree with Doyle and Rutherford (1984) and state that "the choice of any two dimensions on which students vary is bound to be somewhat arbitrary because there are so many individual difference variables that influence learning" (p. 17). Performance in class is viewed as a product of many interactions that take place between students, teachers, and the classroom environment in general.

On the basis of matching instructional techniques and learning styles, Cronbach and Snow (1977) conclude that "basing instructional adaptations on student preferences does not improve learning and may be detrimental" (p. 170). Doyle and Rutherford (1984) agree with Cronbach and Snow by stating that "learning style clearly cannot be a sole basis for designing instruction. Nor is it always clear how styles of learners and teachers affect achievement" (p. 23).

Good and Stipek (1983) reinforce the conclusions of Cronbach and Snow (1977) and Doyle and Rutherford (1984)

when they say that "the research evidence for adapting instruction for students solely on the basis of students' cognitive styles is not compelling" (p. 35).

The Dunn's (1979b) express different feelings about this issue and remark that "both administrators and teachers should be aware that students succeed best by utilizing their own most natural learning styles" (p. 111).

CHAPTER III

METHODOLOGY

Research Design

Selection and Content of the Learning Styles Inventory. The Learning Styles Inventory formulated by Jerry F. Brown and Richard M. Cooper was administered to both the teachers and students. The Learning Styles Inventory is a 45 question diagnostic instrument that measures three dimensions of learning style. Cognitive style is the dimension that refers to the perceptual mode of taking in information. A second dimension, social style, refers to the preference for working alone or in a group. Expressive language which refers to the preferred methods of giving out information is the third dimension measured by the Learning Styles Inventory. The two perceptual modes of visual and auditory language included in the cognitive style dimension of this instrument were chosen for investigation in this study.

Each question on the Learning Styles Inventory offers the respondent a choice of one of four answers. The choices run on a continuum from 1-4, 1 being "least like me" and 4 being "most like me." The numbers 2 and 3 are

chosen if an answer is neither "least like me" or "most like me".

Presenting the Experiment to the Teachers. The Learning Styles Inventory was administered to the social studies teachers at Hilton High School. Before administering the inventory, it was briefly explained and any questions were answered. The teachers were given four days to complete it.

Evaluation of the Teachers. Analysis of the ten Learning Styles Inventories was done. Using the information from the bar graph shown on each individual print out, the researcher chose four teachers, two with a visual language preference and two with an auditory language preference. The two teachers chosen for their auditory preference were the only two of the ten teachers who indicated this preference over a visual preference. The remaining six teachers showed a stronger preference for visual than for auditory, whereby two were then randomly chosen to continue this study.

Presenting the Experiment to the Students. One 11th grade regents class was chosen from each of the four teachers to use in the experiment. A population of 96 students is represented in this study. Two separate days were chosen to administer the Learning Styles Inventory.

to the four classes. The researcher went over the directions of the inventory, answered any questions, then administered it to the students. The researcher remained in the classroom, for approximately fifteen minutes until all the inventories were completed by the students.

Evaluation of the Students. Evaluation of the students' Learning Styles Inventories was done. A chart was made for each class that displayed each student's name and his or her numeric score between 0 and 40+ for both visual and auditory language. These numeric scores were calculated from the bar graph shown on the individual print out.

The researcher noted those students whose perceptual modality preferences matched that of their teacher. Those students who had a three point or less difference between their visual and auditory language preference scores were not considered matching or mismatching their teacher but were considered neutral. The number of students with a visual language preference, an auditory language preference, and those considered neutral were then tallied for each class.

The mean grade point average of four marking periods during the 1985-86 school year was then calculated for each student who matched and mismatched their teacher. It was this grade point average that was used to determine

if students' grades differed in any way whether their perceptual modality preference matched or mismatched their teachers' preferences.

Hypotheses. (null)

- H₀1 = There is no significant relationship between the four teachers and their perceptual modality preference scores.
- H₀2 = The teachers' perceptual modality preferences will not influence their students' perceptual modality preferences.
- H₀3 = There is no significant relationship between the perceptual modality preferences of the teachers and the perceptual modality preferences of their students.
- H₀4 = There is no influence on students' grade point averages when the students' perceptual modality preferences match the perceptual modality preferences of their teachers.
- H₀5 = Students with a particular perceptual modality preference taught by a teacher with a similar perceptual modality preference will not have higher grade point averages than students whose perceptual modality preferences do not match that of their teachers.

CHAPTER IV

RESULTS

Teachers' Visual and Auditory Scores

The visual and auditory scores that resulted from the Learning Styles Inventory for each of the teachers are listed in Table 1. These scores were obtained from the bar graph information provided on each teacher's individual computer print out. The range of these scores was from 0 to 40+. The 0 end of the graph represents "least like me" and the 40+ end on the bar graph represents "most like me."

Of the four teachers, only one, V_2 (Visual), showed a marked difference between his auditory and visual preference scores. The other three teachers' auditory and visual scores are much closer.

There is some discrepancy between the observed and expected frequencies, but not enough discrepancy to not attribute it to sampling error.

The critical value of χ^2 for 3df is 7.82 at the 95 percent confidence level. The χ^2 obtained was 6.57, therefore the data in Table 1 led to the retention of:

Table 1

Teachers Learning Styles Inventory Scores

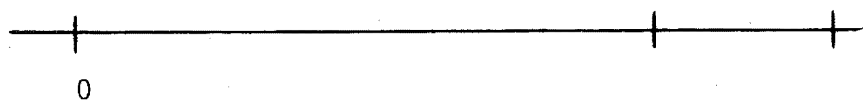
Teachers	Visual Score	Auditory Score	Row Margin
V_1	32 31.67	28 28.33	60
V_2	32 24.81	15 22.19	47
A_1	26 30.61	32 27.39	58
A_2	24 26.92	27 24.08	51
Column Margin	114	102	216

Number of Observations 216

Chi-Square 6.5664

Degrees of Freedom 3

Obtained	Critical
χ^2	χ^2
6.57	7.82



H_0 = There is no significant relationship between the four teachers and their perceptual modality preference scores.

Influence of Teacher Preference on Student Preference

The number of students with a visual, auditory, or neutral perceptual modality preference for each of the four teachers' classes are shown in Table 2.

Several noteworthy observations from Table 2 can be seen. In all four classes more students exhibited a visual preference over an auditory preference regardless of the preference of the teacher. Also, the teacher with the only marked difference in his own visual and auditory scores, V_2 (Table 1), had the class with the largest gap between students with a visual preference and those with an auditory preference.

There is not enough discrepancy between the observed and expected frequencies to not attribute it to sampling error.

For the data in Table 2, the critical value of χ^2 for 6df is 12.59 at the 95 percent confidence level. The χ^2 obtained was 6.93 which led to the retention of:

Table 2

Individual Teachers and their Students' Perceptual Modality Preferences

Teachers	Visual Preference	Auditory Preference	Neutral	Row Margin
V_1	13 14.91	7 7.88	7 4.22	27
V_2	16 13.25	5 7.00	3 3.75	24
A_1	10 12.70	9 6.71	4 3.59	23
A_2	14 12.15	7 6.42	1 3.44	22
Column Margin	53	28	15	96

Number of Observations 96
 Chi-Square 6.9333
 Degrees of Freedom 6

Obtained χ^2 6.93
 Critical χ^2 12.59



H_02 = The teachers' perceptual modality preferences will not influence their students' perceptual modality preferences.

Relationship Between Teachers' and Students' Perceptual Modality Preferences

The two visual preferred teachers and the two auditory preferred teachers are grouped together in Table 3. In addition, the total number of students exhibiting a visual, auditory, or neutral preference are grouped together for each set of teachers.

The data in Table 3 was compiled and analyzed to see if the possibility existed that a student's perceptual modality preference could be guessed by knowing his or her teacher's preference.

As shown by the observed and expected frequencies, there is not enough discrepancy between them to not attribute it to sampling error.

The critical value of χ^2 for 2df is 5.99 at the 95 percent confidence level whereas the χ^2 obtained was 2.34. This data, therefore, led to the retention of:

H_03 = There is no significant relationship between the perceptual modality preferences of the teachers and the perceptual modality preferences of their students.

Table 3

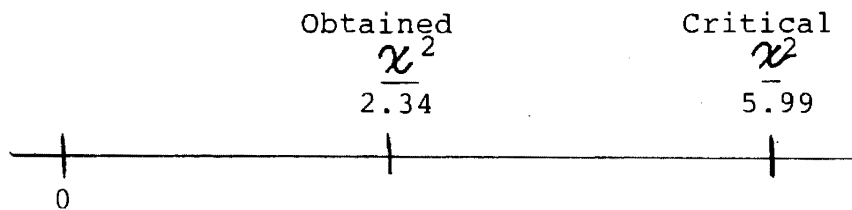
Grouped Teachers and their Students' Perceptual Modality Preferences

Teachers	Visual Preference	Auditory Preference	Neutral	Row Margin
Visual Teachers	29 28.16	12 14.88	10 7.97	51
Auditory Teachers	24 24.84	16 13.13	5 7.03	45
Column Margin	53	28	15	96

Number of Observations 96

Chi-Square 2.3439

Degrees of Freedom 2



The Grade Averages of Students Whose Preferences Matched
Those of their Teachers

The grade point averages of those students whose perceptual modality preference matched the perceptual preference of their teachers were analyzed to determine if there was an influence on students' grade point averages as a result of the matching preferences.

Only grades 92 or above, the A range, and those grades below an 82, the C and below range, were considered. Only the students whose grades fell into one of these two categories were considered in Table 4.

As shown from the data in Table 4, there is not enough discrepancy between the observed and expected frequencies to not attribute it to sampling error.

The critical value of χ^2 for 1df is 3.84 at the 95 percent confidence level and the χ^2 obtained was 1.01. The data in Table 4, therefore, led to the retention of:

H_0 = There is no influence on students' grade point averages when the students' perceptual modality preferences match the perceptual modality preferences of the teachers.

Table 4

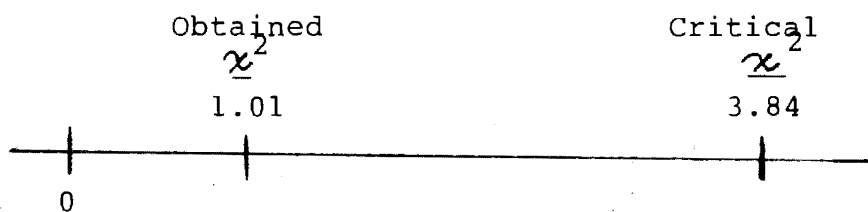
Number of Matched Students and their Grade Category

Perceptual Preferences of Teachers	Grades 92 or more	Grades Below 82	Row Margin
Matched Visual	2 1.35	23 23.65	25
Matched Auditory	0 .65	12 11.35	12
Column Margins	2	35	37

Number of Observations 37

Chi-Square 1.0149

Degrees of Freedom 1



The Grade Averages of Students Whose Preference Matched
or Mismatched the Preferences of their Teachers

The data in Table 5 was compiled and analyzed to see if a higher grade point average would result for students whose perceptual modality preferences matched that of their teachers.

The scores or grade point averages for both Group One and Group Two are the mean scores of four marking periods for each student. Group One consists of those students who matched their teachers and Group Two are the grade point averages of those students who mismatched their teachers.

As can be seen from Table 5, the mean scores for both groups were very close, the grades of those who matched and those who mismatched their teachers were not very different.

At the 95 percent confidence level, the t required is 1.96 and a 1.02 was obtained. Therefore, the data from Table 5 led to the retention of:

H_0 = Students with a particular perceptual modality preference taught by a teacher with a similar perceptual modality preference will not have higher grade point averages than students whose perceptual modality preferences do not match that of their teachers.

Table 5

Grade Averages of Students Who Matched and MismatchedTeachers

THE 45 SCORES FOR GROUP 1:

68.50	73.50	69.25	81.75	70.25	73.50	73.75	81.50
88.50	87.50	86.50	85.25	73.50	75.50	69.75	73.25
79.00	74.75	94.25	88.33	83.00	79.50	73.75	71.00
77.50	69.75	87.00	73.00	79.75	92.50	75.33	73.66
69.00	79.50	72.25	81.00	66.50	79.50	71.75	72.00
73.25	82.25	64.00	81.25	71.50			

THE 36 SCORES FOR GROUP 2:

91.75	88.50	70.00	83.25	75.50	84.75	72.25	76.00
89.50	63.00	93.50	90.50	67.25	69.00	85.25	87.25
83.75	79.75	83.00	83.25	94.00	78.75	69.75	94.50
74.75	90.00	73.75	81.25	78.00	65.75	68.50	71.00
70.50	66.50	72.75	73.75				

ITEM	GROUP 1	GROUP 2
N	45	36
MEAN	77.0571	78.9028
STANDARD DEVIATION	7.1171	9.1512

T-VALUE	1.0213
ONE TAILED PROBABILITY	0.1555
POINT-BISERAL CORRELATION	0.1142

CHAPTER V

SUMMARY AND CONCLUSIONS

The main purpose of this study was to determine if the matching of students' and teachers' perceptual modality preferences would have any significant effect on the students' performance in comparison to those students who did not match their teachers. Five questions were dealt with in this study:

1. How different are the four teachers as a result of their visual and auditory scores?
2. Would the teachers' perceptual preference influence their students' perceptual preferences?
3. Could a student's perceptual modality preference be guessed by knowing his or her teacher's perceptual modality preference?
4. Could there be any influence on the grade averages of students whose perceptual modality preferences matches that of their teachers?
5. Would those students who matched their teachers according to perceptual modality preference have higher grade averages than those students who mismatched their teachers' preferences?

Summary of Results

As a result of their visual and auditory preference scores, the four teachers were not much different from each other. Only one teacher of the four, V_2 , displayed a real marked difference between his visual and auditory preference scores.

The students' perceptual modality preferences were not found to be influenced by their teachers' perceptual modality preferences. In each of the four classes there were more students with a visual preference in comparison to an auditory preference or a neutral preference. It was shown that students retained their perceptual modality preference regardless of their teachers' preferences.

It was found that by knowing the perceptual modality preferences of the teachers was not enough to be able to predict the perceptual modality preferences of the students. Therefore, it can be said that students were not influenced by their teachers' preferences, but, rather, retained their own.

There was no influence on students' grade averages when their perceptual modality preferences matched those of their teachers. Because a student's perceptual modality preference matched his or her teacher's, did not mean that he or she would have a higher grade

average. In fact, only two students of 29 with a visual preference obtained a grade average of 92 or above, whereas, 23 students of 29 had class averages below an 82. The same resulted for the auditory students. Of 16 students exhibiting an auditory preference, none had a class average of 92 or above, while 12 of the 16 students earned a grade average below an 82.

The grade averages of both the group of students who matched their teachers' preferences (Group One) and the students who mismatched their teachers' preferences (Group Two), were quite similar. The mean score for Group One was 77.06 and Group Two's mean score was 78.90. Therefore, students who preferred the same perceptual modality as their teachers did not have higher grade averages than those students who mismatched their teachers' preferences.

Limitations on the Study

Allowing the teachers four days to complete the Learning Styles Inventory, may have affected their responses. The teachers may have chosen to change some of their responses after thinking about the questions over the four day period. They may have also discussed

the inventory and their answers with each other which may have resulted in different responses than had the inventory been given to them in a time framework similar to what was used for the students.

All 11th grade social studies regents classes were chosen for this study. Perhaps the matching principle would have had different results had a blend of students from different grade levels and from heterogeneous groupings been chosen. Also, had a different subject area or representatives from several subject areas been chosen, different results may have been obtained in regards to the matching principle.

Using grade averages as a measure of performance or achievement posed a problem. Grade point average is only one measure of student achievement. Use of a standardized test as a measure of student achievement ought to be used in future research.

Teachers with more marked preferences could be identified in future studies when examining perceptual modality preferences on students' achievement.

Teachers with marked preferences should be utilized in future studies. There was not much difference between the scores of each of the teachers with the exception of one of the teachers. Teachers did not exhibit a

significant difference between their visual and auditory preference scores. It cannot be said conclusively that perceptual modality preference does not affect student achievement.

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APPENDICES

Appendix A

Learning Styles Inventory

Sample: I would rather do work in the afternoon than in the morning.

(4) (3) (2) (1)

A number "4" response means that you prefer to work in the afternoon. A response of "1" means that you very much prefer to work in the mornings. There is no right or wrong response, only the way you feel about the statement. You may have all the time you need so please respond to every statement. Now, if there are no other questions, go on with the survey.

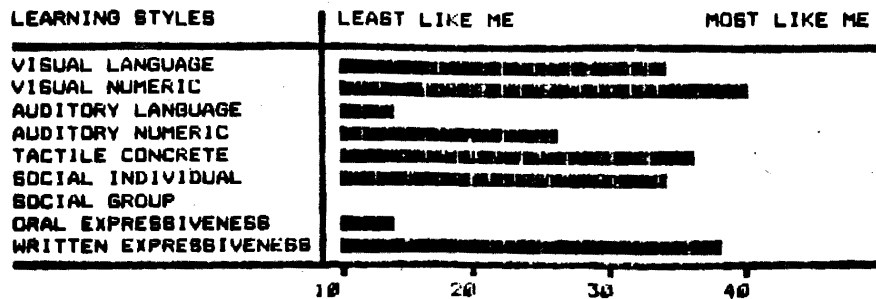
	Most Like Me			Least Like Me
1. Making things for my studies helps me to remember what I have learned.	(4)	(3)	(2)	(1)
2. I can write about most of the things I know better than I can tell about them.	(4)	(3)	(2)	(1)
3. When I really want to understand what I have read, I read it softly to myself.	(4)	(3)	(2)	(1)
4. I get more done when I work alone.	(4)	(3)	(2)	(1)
5. I remember what I have read better than what I have heard.	(4)	(3)	(2)	(1)
6. When I answer questions, I can say the answer better than I can write it.	(4)	(3)	(2)	(1)
7. When I do math problems in my head, I say the numbers to myself.	(4)	(3)	(2)	(1)
8. I enjoy joining in on class discussions.	(4)	(3)	(2)	(1)
9. I understand a math problem that is written down better than one that I hear.	(4)	(3)	(2)	(1)
10. I do better when I can write the answer instead of having to say it.	(4)	(3)	(2)	(1)
11. I understand spoken directions better than written ones.	(4)	(3)	(2)	(1)
12. I like to work by myself.	(4)	(3)	(2)	(1)
13. I would rather read a story than listen to it read.	(4)	(3)	(2)	(1)
14. I would rather show and explain how a thing works than write about how it works.	(4)	(3)	(2)	(1)
15. If someone tells me three numbers to add, I can usually get the right answer without writing them down.	(4)	(3)	(2)	(1)
16. I prefer to work with a group when there is work to be done.	(4)	(3)	(2)	(1)
17. A graph or chart of numbers is easier for me to understand than hearing the numbers said.	(4)	(3)	(2)	(1)
18. Writing a spelling word several times helps me remember it better.	(4)	(3)	(2)	(1)
19. I learn better if someone reads a book to me than if I read it silently to myself.	(4)	(3)	(2)	(1)

	Most Like Me			Least Like Me
20. I learn best when I study alone.	(4)	(3)	(2)	(1)
21. When I have a choice between reading and listening, I usually read.	(4)	(3)	(2)	(1)
22. I would rather tell a story than write it.	(4)	(3)	(2)	(1)
23. Saying the multiplication tables over and over helped me remember them better than writing them over and over.	(4)	(3)	(2)	(1)
24. I do my best work in a group.	(4)	(3)	(2)	(1)
25. I understand a math problem that is written down better than one I hear.	(4)	(3)	(2)	(1)
26. In a group project, I would rather make a chart or poster than gather the information to put on it.	(4)	(3)	(2)	(1)
27. Written assignments are easy for me to follow.	(4)	(3)	(2)	(1)
28. I remember more of what I learn if I learn it alone.	(4)	(3)	(2)	(1)
29. I do well in classes where most of the information has to be read.	(4)	(3)	(2)	(1)
30. I would enjoy giving an oral report to the class.	(4)	(3)	(2)	(1)
31. I learn math better from spoken explanations than written ones.	(4)	(3)	(2)	(1)
32. If I have to decide something, I ask other people for their opinions.	(4)	(3)	(2)	(1)
33. Written math problems are easier for me to do than oral ones.	(4)	(3)	(2)	(1)
34. I like to make things with my hands.	(4)	(3)	(2)	(1)
35. I don't mind doing written assignments.	(4)	(3)	(2)	(1)
36. I remember things I hear better than things I read.	(4)	(3)	(2)	(1)
37. I learn better by reading than by listening.	(4)	(3)	(2)	(1)
38. It is easy for me to tell about the things that I know.	(4)	(3)	(2)	(1)
39. It makes it easier when I say the numbers of a problem to myself as I work it out.	(4)	(3)	(2)	(1)
40. If I understand a problem, I like to help someone else understand it too.	(4)	(3)	(2)	(1)
41. Seeing a number makes more sense to me than hearing a number.	(4)	(3)	(2)	(1)
42. I understand what I have learned better when I am involved in making something for the subject.	(4)	(3)	(2)	(1)
43. The things I write on paper sound better than when I say them.	(4)	(3)	(2)	(1)
44. I find it easier to remember what I have heard than what I have read.	(4)	(3)	(2)	(1)
45. It is fun to learn with classmates, but it is hard to study with them.	(4)	(3)	(2)	(1)

Appendix B

Learning Styles Inventory
Printout Information

LEARNING STYLES CHART FOR KEVIN JONES



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VISUAL LANGUAGE means that you learn language skills by sight, mainly by reading.

VISUAL NUMERIC means that you do better with numbers when you see them written.

AUDITORY LANGUAGE means that you learn best by listening.

AUDITORY NUMERIC means you are better with numbers when you can hear them spoken.

TACTILE CONCRETE means you are a builder and learn best when you can touch what you are studying.

SOCIAL INDIVIDUAL means you prefer to work on your own.

SOCIAL GROUP means you learn best by interacting with a group.

ORAL EXPRESSIVENESS means how well you express yourself when you talk.

WRITTEN EXPRESSIVENESS means how well you express yourself in writing.

.....

PRESCRIPTIVE INFORMATION FOR KEVIN JONES

1. Use books, pamphlets, and other written material to enhance learning. Write important information on the board, hand out written instructions, or have student(s) take notes in class.
2. Use worksheets and workbooks for student(s). Work problems on the board or have student(s) work them on the board.
3. Student(s) will need some hands-on experience to supplement learning. Have student(s) draw pictures or act out a story. Use physical objects such as blocks to teach math concepts.
4. Save socializing experiences for non-learning situations. Give student(s) time alone to work on problems and assignments.
5. Allow student(s) to write reports, and keep journals and notebooks for credit. Emphasize written tests. Oral work should come in low pressure, non-learning situations.