

THE RELATIONSHIP OF FIFTY LEARNER VARIABLES TO  
ACHIEVEMENT IN A UNIVERSITY FRESHMAN COURSE  
TAUGHT BOTH FACE-TO-FACE AND BY  
CLOSED-CIRCUIT TELEVISION

Thesis for the Degree of Ph. D.  
MICHIGAN STATE UNIVERSITY  
DONALD G. WYLIE  
1967

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ABSTRACT OF A THESIS

Submitted to

Michigan State University

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## ABSTRACT

### THE RELATIONSHIP OF FIFTY LEARNER VARIABLES TO ACHIEVEMENT IN A UNIVERSITY FRESHMAN COURSE TAUGHT BOTH FACE-TO-FACE AND BY CLOSED-CIRCUIT TELEVISION

by Donald G. Wylie

This study investigated the relationship of academic motivation to the use of television to present course lectures in a freshman course at Michigan State University. Specifically, the study: (1) compared the characteristics of high and low achievers in TV sections of a course in American Thought and Language with the characteristics of high and low achievers in sections of the course in which lectures were received face-to-face with the lecturer in a large lecture hall; and (2) compared the relationship of selected learner characteristics to course achievement in the two viewing conditions.

Fifty learner characteristics, selected to represent the social-personal and educational backgrounds of the students, academic attitudes, and reactions to the lectures in the course, were compared across the achievement groups, using the median and Chi square tests of significance. Additionally, each learner variable was correlated with the measure of course achievement (course grades) in each of the viewing conditions (TV and face-to-face) to determine which variables interacted with the methods

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used to present course lectures.

No comparison produced results much above those which could be expected by chance. High achievers in the TV group were more apt to have participated in high school activities than high achievers in the face-to-face group. Low achieving TV students expected less faculty contact and had higher information levels on entering college than low achieving face-to-face students.

Correlating the learner variables with course grades in the two viewing conditions produced three pairs of correlations in which the correlation was significantly greater in the face-to-face group than in the TV group: (1) "Expectations before entering college regarding faculty contact"; (2) "Attitude before entering college toward extra-curricular activities"; and (3) "Preference for library research."

In general the learner variables tended to correlate higher in the face-to-face group than in the TV group, suggesting that grades of students in face-to-face sections of the course tended to be more influenced by internal motivational factors than students in TV sections.

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## CHAPTER I

### THE PROBLEM

#### Need for the Study

The "crisis of numbers"<sup>1</sup> which has occurred in higher education is forcing colleges and universities to adopt new and different teaching methods. Closed-circuit instructional television is one of the new educational media to which higher education has turned in the last decade as enrollments have increasingly exceeded the rate graduate schools have been able to educate qualified college instructors.

That colleges and universities are utilizing closed-circuit television is demonstrated by a study of its growth in education conducted by Campion and Kelley.<sup>2</sup> They report that while in 1954 there were only 29 closed-circuit TV installations in American colleges and universities, by July, 1962, the number had

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<sup>1</sup>Samuel Baskin (ed.), Higher Education: Some Newer Developments, (New York: McGraw-Hill, 1965), p. vi.

<sup>2</sup>Lee E. Campion and Clarice Y. Kelley, Studies in the Growth of Instructional Technology, II: A Directory of Closed-Circuit Television Installations in American Education With A Pattern of Growth. Technological Development Project Occasional Paper No. 10. (Los Angeles: School of Education, University of Southern California, 1963).

grown to 344.<sup>3</sup> It has been estimated that by 1970 every major college and university will have at least one closed-circuit TV system in operation, and many will have several installations.<sup>4</sup>

The growth of instructional television, both broadcast and closed-circuit, has generated considerable research interest in the relative teaching effectiveness of the medium. In the main this research has compared achievement in classes taught by television with achievement in similar classes taught conventionally. The conclusion of the researchers--and of school administrators, teachers and even the students themselves--has been that the average student is likely to learn as much from television as from ordinary classroom methods. "In some cases he will learn more, and in some less, but over-all the conclusion has been 'no significant difference'."<sup>5</sup>

Comparatively little research has examined the relationship of individual learner characteristics to achievement in classes taught by television. Research thus far suggests that one learner variable,

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<sup>3</sup>Ibid., p. 19.

<sup>4</sup>Lester Asheim, "A Survey of Informed Opinion on Television's Future Place in Education," in Educational Television: The Next Ten Years, W. Schramm (ed.), (Stanford, Cal.: The Institute for Communication Research, Stanford University, 1962), p. 33

<sup>5</sup>Wilbur Schramm, "What We Know About Learning From Instructional Television," in Educational Television: The Next Ten Years, W. Schramm (ed.), (Stanford, Cal.: The Institute for Communication Research, Stanford University, 1962), p. 52.

intelligence, interacts with the use of television to cause some students to learn better in a TV class than in a conventionally taught class.

Schramm, for example, believes that both brighter students and slower students are apt to learn more in a television class, "the former, because they learn rapidly anyway, and television can theoretically offer them a greater number and variety of responses to learn; the latter, because television concentrates their attention as the classroom often does not."<sup>6</sup> But despite considerable research, "it must be admitted that we do not yet understand the relation of mental ability to differential learning from television."<sup>7</sup>

There are a multitude of variables in addition to mental ability which determine success in a given college course. McDermott states that "the literature agrees that there are vexing factors other than intellectual ability that have a bearing on success or failure in college work."<sup>8</sup>

But at this time the only practical method of predicting the achievement of a student is a measure of his native intelligence or

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<sup>6</sup>Ibid., p. 66.

<sup>7</sup>Ibid.

<sup>8</sup>Frances M. McDermott, "A Study of Some Selected Factors That Contribute to Success or Failure in Freshman Communication Skills" (unpublished doctoral dissertation, College of Education, Michigan State University, East Lansing, Michigan, 1960), p. 29.



"academic aptitude." When all of the remaining learner variables combine to permit a student to consistently achieve above his measured aptitude, we say he is an over-achiever, and that he is highly motivated to achieve academically. When the non-intellectual variables cause an individual to consistently achieve under his measured aptitude, we say he is an under-achiever, and that he lacks motivation.

Thus it can be said that cognitive and affective factors other than native intelligence which affect academic achievement may be components of academic achievement motivation. That is, academic motivation can be defined as a combination of factors other than native mental and manipulative ability which together with them determine academic achievement.<sup>9</sup>

Farquhar is one of many psychologists who agree that "academic achievement is primarily a combination of skill, aptitude and motivation."<sup>10</sup>

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<sup>9</sup> Some theorists have questioned the usefulness of the concept of motivation (and the related, if not synonymous concept of drive) for the very reason that it can be operationalized only in terms of specified internal and external variables. The issue is fully described in The Motivation of Behavior by Judson S. Brown, (New York: McGraw-Hill, 1961), Chapter II.

<sup>10</sup> William W. Farquhar, Motivation Factors Related to Academic Achievement, (Cooperative Research Project 846), (East Lansing, Mich." College of Education, Michigan State University, January, 1963), p. 1.



Farquhar continues:

Unfortunately, the study of academic motivation has not made the comprehensive strides that have been made in skill and aptitude assessment. The need to understand the forces of academic motivation becomes ever more pressing as society depends increasingly on formal education to undergird a developing technology.<sup>11</sup>

Farquhar is not alone in believing we need a better understanding of academic motivation. Carpenter states:

We are still comparatively ignorant and lacking in the understanding of motivation, the knowledge of how motivation is regulated and how it may be directed toward academic achievements. We do not have adequate measures for the M. Q. which compare favorably with the measures for the I. Q.<sup>12</sup>

McKeachie is another who finds that means for assessing motivation are limited:

Almost everyone has agreed that individual differences in motivation are responsible for much of the remaining variance in college grades. Considering the effort devoted to finding predictors of college success, it is astonishing that we still have no measure of motivation which has proved generally useful for college admission officers or counsellors.<sup>13</sup>

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<sup>11</sup>Ibid.

<sup>12</sup>C. Ray Carpenter, "The Science of Learning in Relationship to Education", in Report of the All-Faculty Conference on Learning Resources for Higher Education, (East Lansing, Mich.: Michigan State University, April, 1962), p. 5.

<sup>13</sup>Wilbert J. McKeachie, "Motivation, Teaching Methods, and College Learning", in Nebraska Symposium on Motivation: 1961, M. Jones (ed.), (Lincoln, Neb.: University of Nebraska Press, 1961), p. 113

Not only are better ways of measuring motivation needed, but also there is a need to relate what we do know about motivation and motivational variables to the use of the new educational media as teaching methods in higher education. McKeachie, after commenting on both the problem of finding means for accurately predicting achievement in college and the conflicting findings in research comparing different college teaching methods, states:

One possible partial explanation for the meager findings in both these areas is that teaching methods affect different students differently. Students who profit from one method may do poorly in another, while other students may do poorly in the first method and well in the second. When we average them together we find little over-all difference between methods and no over-all effect of a single motivational measure.<sup>14</sup>

More recently McKeachie added:

Additional complications are undoubtedly introduced by the probability that the best method of instruction may depend upon the instructor or upon the content or goals of instruction. This means we need a great deal of research on interactions between the many factors entering into the complexity of educational situations. (Emphasis added.)<sup>15</sup>

Other researchers and theorists agree with McKeachie. In her doctoral dissertation, McDermott summarized her review of the

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<sup>14</sup>Ibid.

<sup>15</sup>Wilbert J. McKeachie, "Automotion: New Media in Education-Concern and Challenges," College and University Bulletin, Association for Higher Education, Vol. 18, No. 3, November 1, 1965, p. 4.

literature in academic motivation with the comment: "In nearly every instance, authors indicated that further investigation on the non-intellectual factors and their bearing on success in college would be a fruitful pursuit in the field of education."<sup>16</sup>

### Purpose of the Study

The present study attempts to determine the relationship of a selected group of non-intellectual (motivational) learner variables to achievement in face-to-face and in television sections of a Michigan State University freshman course in American Thought and Language. The purpose of the study was to answer two questions:

1. Given 50 selected learner characteristics, will high and low achievers in TV sections of a university freshman course exhibit the same characteristics as high and low achievers in face-to-face sections of the course?
2. Will the 50 selected learner variables relate to course grades differently in TV sections of the university freshman course than in face-to-face sections of the course?

The variables were obtained from tests administered during the 1965 orientation period by the Office of Evaluation Services, from experimental test batteries administered before and during the Fall

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<sup>16</sup>McDermott, op. cit., p. 29.

Term of 1965 by three different research teams, and from the records of the Michigan State University Registrar.<sup>17</sup>

The following learner variables were compared with achievement in the study:

1. Age
2. Sex
3. Nativity of parents
4. Size of home town
5. Size of graduating class
6. Type of high school
7. Standing within high school graduating class
8. Participation in high school activities
9. Church attendance
10. Religious preference
11. Education of father
12. Education of mother
13. Occupation of father
14. Mother housewife or employed
15. Years of college desired
16. Years of college actually expected
17. Plans for outside job at MSU
18. Source of funds for education
19. Expectations regarding dating at MSU
20. Expectations regarding participation in activities at MSU
21. Expectations regarding faculty contact at MSU
22. Expectations regarding prejudice at MSU
23. Literary interest
24. Intellectual aggressiveness
25. Self-concept of academic ability
26. High grade aspirations
27. Self-confidence

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<sup>17</sup> The basis for selecting the variables, the tests from which they were obtained, and the methods employed to extract them are discussed in Chapter III.

28. Interest in the theoretical
29. Non-utilitarian academic goals
30. Attitude toward extra-curricular activities
31. Desire for education to be practical
32. Attitude toward the intellectual
33. Preference for library research
34. Attitude toward school life
35. Attitude toward out-of-class study
36. Desire for solitude
37. Academic anxiety
38. Preference for lab research
39. English ability
40. Reading ability
41. Verbal ability
42. General information level
43. Evaluation of course
44. Perceived ease of interaction with the lecturer in ATL 111
45. Perceived ability to see and hear lectures in ATL 111
46. Perceived ease of concentrating on lectures in ATL 111
47. Attitude toward TV instruction
48. Number of ATL 111 review sessions attended
49. Expectation of final grade before final examination
50. Absences in course

The study compares the relationship of these variables to achievement in two teaching methods: (1) face-to-face large classroom lecture, and (2) closed-circuit television lecture. To hold constant both course content and the personality of the lecturer, the study utilized a course in which the lecturer addressed simultaneously a large group of students seated in front of him in the lecture hall and two TV cameras located in the rear of the lecture hall.

The relationship between the 50 learner variables and achievement

in the two treatment groups was examined in two ways. First, students in each treatment (teaching method) group were subdivided into three achievement groups--high, normal and low--by comparing actual course grades to the grades predicted by student aptitude scores. The normal achievers were then set aside, and scores for a given variable were compared across treatment groups for high and low achieving students.

It was postulated earlier that a combination of non-intellectual variables determines an individual's motivational level. To suggest typologies for students who appear to perform well or poorly when taught by TV as compared with students taught face-to-face in a lecture hall, significant differences in the comparison of achievement groups were summarized in a table:

TABLE 1  
FOUR TYPOLOGIES PRODUCED BY DIVIDING VIEWING  
GROUPS INTO ACHIEVEMENT SUBGROUPS

	TV Instruction	Face-to-Face Instruction
High Achievers	A. Characteristics of high-achieving students in TV sections of ATL 111.	B. Characteristics of high-achieving students in face-to-face sections of ATL 111.
Low Achievers	C. Characteristics of low-achieving students in TV sections of ATL 111.	D. Characteristics of low-achieving students in face-to-face sections of ATL 111.

In the second analysis of the data, each variable was correlated with course grades, first for students in the TV group, and then for students in the face-to-face group. The correlations in the TV group were then compared with the correlations in the face-to-face group for each of the variables to suggest individual learner characteristics which tended to interact with the teaching methods which were used to teach ATL 111.

### Definition of Terms

#### Non-intellectual Learner Variables<sup>18</sup>

Learner characteristics other than native mental ability which may affect academic achievement. To the extent they are found to affect academic achievement in systematic ways they can be considered components of academic motivation.

#### Academic Motivation

"A combination of forces which initiate, direct, and sustain behavior toward a scholarly goal."<sup>19</sup> These forces include physiological and psychological drives within the learner (internal motivation), and environmental determinants of behavior, such as goals perceived to be attractive and desirable, and social incentives (external motivation).<sup>20</sup>

#### Over-achievers

Students receiving course grades higher than the grades predicted by their aptitude (CQT) scores. Over-achievers in a given college course can be considered to be relatively more highly motivated to achieve than other students in the course.

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<sup>18</sup> The 50 variables used in this study are individually defined in Chapter III

<sup>19</sup> Farquhar, op. cit., p. 3.

<sup>20</sup> Chester V. Good (editor), Dictionary of Education (New York: McGraw-Hill Book Company, 1959), p. 354.



Normal-achievers

Students receiving course grades essentially the same as the grades predicted by their aptitude (CQT) scores.

Under-achievers

Students receiving course grades lower than the grades predicted by their aptitude (CQT) scores. Under-achievers in a given college course can be considered to be relatively less motivated to achieve than other students in the course.

American Thought and Language (ATL 111)

A three credit freshman course at Michigan State University. As described in the MSU catalogue, the course is concerned with:

Training in reading and writing through the use of selected American documents; particular emphasis on structure and development of ideas.<sup>21</sup> Introduction to library use. Weekly writing assignments.

Of 184 sections of ATL 111 offered during the Fall Term of 1965, 14 involved the use of CCTV. Four of these 14 sections met together to view course lectures face-to-face with the lecturer in the Giltner Lecture Hall. Ten sections viewed the same lectures by television. All 14 sections received lectures three times each week. Once each

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<sup>21</sup>Michigan State University Catalogue, (East Lansing, Mich.: Michigan State University, 1966), p. A-8.

week each section met with an assistant instructor to discuss written assignments, review reading assignments, and receive quizzes.

### Assumptions Underlying the Study

1. Academic motivation (more precisely, academic achievement motivation) is a construct which is useful, definable and measurable.

This first assumption, while fundamental to the study, is not a simple one to defend. Psychologists are divided on the usefulness of the construct "motivation." Some learning theorists believe that research in motivation cannot avoid tautological reasoning and internal inconsistencies, while others maintain that internal motivation can reasonably be considered a single characteristic of individuals, but that we have not yet discovered means for measuring the characteristics.<sup>22</sup>

Vinacke is a theorist who believes most if not all variables studied by psychologists are in some way motivational in nature.<sup>23</sup>

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<sup>22</sup>Judson S. Brown, The Motivation of Behavior (New York: McGraw-Hill, 1961), Chapter II

<sup>23</sup>W. Edgar Vinacke, "Motivation as a Complex Problem," in Nebraska Symposium on Motivation: 1962, M. Jones, ed. (Lincoln, Neb.: University of Nebraska Press, 1962), pp. 1-46

Yet he also suggests that motivation may be a unique characteristic of individuals. Vinacke maintains there are six interrelated and interdependent classes of conditions that determine the quantity and/or the quality of human performance. He defines these classes in a table:

TABLE 2  
CLASSES OR CONDITIONS THAT DETERMINE THE  
QUANTITY OR QUALITY OF PERFORMANCE  
(from Vinacke<sup>24</sup>).

<u>Class</u>	<u>Definition of Source</u>
1. Chance (error)	Uncontrolled or unknown influences (e. g. , extraneous environmental stimulation. )
2. Intelligence, Ability	General level of performance, when one person is compared with another under (nearly) identical conditions.
3. Non-intellectual	Personal or biological characteristics that cut across tasks or persons, making them alike or different, without specific reference to task or goal (e. g. , muscular coordination, sensory thresholds, many personality "traits").
4. Past experience	Degree and kind of exposure to similar or related tasks (essentially, transfer), as distinct from immediate task (e. g. , familiarity, perpetual processes, concepts, previous practice).

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<sup>24</sup>Ibid. , p. 12



TABLE 2. --Continued

<u>Class</u>	<u>Definition of Source</u>
5. Practice (in the task)	Effects of immediate exposure to or repetition of the task (e. g., trial-by-trial analysis).
6. Motivation	Other things being equal, measures that account for the quantity and quality of performance to the same tasks at different times or by different people (ruling out the above factors, especially #5) or of the same person in different tasks (ruling out the above factors, especially #2).

Vinacke states that Class 6, Motivation, must be listed as a separate entity: "I have been unable to discover any way in which motivation can be excluded or regarded as falling within any of the other categories."<sup>25</sup>

Vinacke's classification of variables affecting human performance suggests the second assumption of the study:

2. Academic motivation is multivariate in nature, comprised of personality, emotional and expectation factors which are dependent on all past experiences of the individual.

In undertaking this study the investigator obviously needed a definite conceptualization of academic motivation. To assist in this

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<sup>25</sup>Ibid.

conceptualization of academic motivation, and to define parameters for the construct, a paradigm was constructed, based on the work of motivation and personality psychologists.

The basic format for the paradigm was suggested by a paradigm developed by Frymire and Thompson to explain academic achievement factors:

Theoretically, achievement in school is a function of past experience and present experiencing. Symbolically, an equation could be contrived to explain learning which might look something like this:

$$E_{pa} + E_{pr} \longrightarrow A$$

in which " $E_{pa}$ " equals past experience, " $E_{pr}$ " equals present experiencing, and " $A$ " equals achievement or learning in school.

Expanding on the constructs inherent in the symbol " $E_{pr}$ " we can logically identify the following components as part of the conceptualization involved: number and quality of stimuli available, neurological abilities of the organism to process these stimuli, and motivation. Using symbols again, our formula for learning now reads like this:

$$E_{pa} + (S + A_n + M) \longrightarrow A$$

in which " $E_{pa}$ " equals past experience, " $S$ " equals stimuli, " $A_n$ " equals neurological ability, " $M$ " equals motivation, and " $A$ " equals achievement or learning in school. <sup>26</sup>

Frymier and Thompson then discuss motivation as being a function

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<sup>26</sup> Jack R. Frymier and James H. Thompson. "Motivation: the Learner's Mainspring", Educational Leadership (Journal of the Association for Supervision and Curriculum Development, May, 1965, Vol. 22, No. 7), p. 567

of self-concept, socio-economic background, personal goals and values, and concept of others,<sup>27</sup> which suggests that motivation (M) and past experience ( $E_{pa}$ ) are closely related if not the same thing.

Others also describe motivation in terms of certain personality and psychological factors. Citing the work of Farquhar and others at Michigan State University, McDonald proposes that "motivation for academic achievement is a personality complex or syndrome which is made up of the following non-intellectual variables:

1. Need for academic achievement (achievement motivation)
2. Self-concept
3. Occupational aspirations
4. Academic personality factors

In his "Investigation Into the Relationship of Socio-Economic Status to an Objective Measure of Motivation--The Michigan M-Scales," McDonald did find socio-economic status to be positively correlated with an objectively scored measure of motivation.<sup>29</sup>

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<sup>27</sup>Ibid., p. 568

<sup>28</sup>Keith H. McDonald, "An Investigation Into the Relationship of Socio-Economic Status to an Objective Measure of Motivation--The Michigan M-Scales" (unpublished doctoral dissertation, Michigan State University, East Lansing, Michigan, 1962).

<sup>29</sup>Ibid., p. 32





In the study by Farquhar, an attempt was made in the review of the literature to relate parental attitudes, self-concept and personality traits to academic motivation. This review of research clearly found a relationship between child rearing practices and academic achievement.<sup>30</sup>

Although the above conceptualizations of academic motivation differ considerable, they (and other writings not cited) do have several elements in common, which can be stated as sub-assumptions of this study:

2a. Academic motivation is an internal state which develops over time, endures once developed, and is brought to the learning situation.

2b. In a given learning situation, environmental conditions, as perceived by the learner, provide external motivational factors which are immediate, transitory and unique to the given learning situation.

2c. In a given learning situation with external motivational factors held constant, individuals will differ in achievement according to their different levels of academic motivation and native mental ability (aptitude).

The above assumptions now permit the extrapolation of the paradigm of the learning situation which was developed for this study. In verbal form this paradigm can be stated:

Given a learning situation with appropriate stimuli, a learner's past experience ( $E_{pa}$ ), in continual interaction

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<sup>30</sup> Farquhar, op. cit., p. 5.

with internal motivational forces ( $M_{in}$ ), sums with external motivational forces ( $M_{ex}$ ) in interaction with aptitude ( $A_{pt}$ ) to determine achievement ( $A_{ch}$ ).

Symbolically the paradigm becomes:

$$(E_{pa} \longleftrightarrow M_{in}) + (M_{ex} \longleftrightarrow A_{pt}) \longrightarrow A_{ch}.$$

Each of the four components of achievement is in turn comprised of a number of factors. Past experience ( $E_{pa}$ ) is perhaps a function of:

1. Physical and neurological structures.
2. Socialization factors, such as: (a) parental attitudes and practices; (b) socio-economic level of family; and (c) social relations with peers.
3. Formal schooling.

Past experience contributes to and interacts with internal motivational forces ( $M_{in}$ ), which are functions of such variables as:

1. Aspirations and expectations
2. Academic personality factors
3. Self-concept.

Past experience and internal motivation combine with external motivational forces ( $E_{ex}$ ), which are related to environmental:

1. Cues
2. Incentives
3. Rewards.

The final component of achievement is aptitude ( $A_{pt}$ ), made up of:

1. Intellectual ability
2. Physical ability
3. Acquired skills.

The present study, as do most academic motivation correlational studies, focuses principally on the first two components of achievement: past experience and internal motivation. Experimental psychologists have been mainly concerned with the last half of the paradigm, namely, investigation of the characteristics of the learning environment which combine with ability to produce learning.

The above paradigm helps to define academic motivation, and to relate the construct to non-intellectual characteristics of learners, to learner aptitude, and to achievement in a given learning situation. But the paradigm does not explain why it is reasonable to assume the construct will affect achievement differently in two different given learning situations: face-to-face lectures and televised lectures. This assumption may be stated:

3. The learning environments which are perceived by students in the TV group and the face-to-face group will be different, will be consistent within each group, and will systematically and differentially interrelate with internal, academic motivation.

Grosslight, in his early paper "Conditions of Learning in a Closed-Circuit Television System," identifies an essential, psychological difference between TV and non-TV students, and suggests why motivation and teaching methods are interrelated:

Let us hypothesize briefly some of the reasons for the greater role of motivation in the television medium of instruction than in direct teaching. We are dealing with the

image of the instructor at least once removed. We might postulate that physical distance is greater between the student and the instructor; I suspect that physical distance is not the essential variable, but rather that distance perceived by the student is the major component of this factor. This perceived distance can be called the psychological distance. The problem of psychological distance in televised instruction would seem an important area for investigation.<sup>31</sup>

Carpenter is less specific than Grosslight, suggesting that the use of television introduces as yet unknown changes in the reward systems that exist in American colleges and universities.<sup>32</sup> However, Carpenter reaches the same conclusion as Grosslight regarding the need for research in the area of motivation in televised instruction:

Televised instruction accentuates the importance of motivation of learners and this leads to the urgent need for research on understanding and controlling of the motivation of students to learn academic subjects. Some of the motivating features may or may not be operative in televised instruction.<sup>33</sup>

One final methodological assumption needs to be stated:

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<sup>31</sup>Joseph H. Grosslight, "Conditions of Learning in a Closed-Circuit Television System," in College Teaching by Television, Adams, Carpenter and Smith (eds.), (Washington, D. C.: American Council on Education, 1958), p. 44.

<sup>32</sup>C. Ray Carpenter, "Approaches to Promising Areas of Research in the Fields of Instructional Television," in New Teaching Aids for the American Classroom (Stanford, Cal.: Institute for Communication Research, Stanford University, 1960), pp. 85-86.

<sup>33</sup>Ibid., p. 86

4. The TV and face-to-face groups are assumed to equally and fairly represent the total 1965 freshman class of Michigan State University.

A sub-assumption can be derived from the above assumption:

4a. In analyzing the data of this study, the TV and face-to-face groups are assumed to be random samples from the total 1965 freshman class.

The last assumption, and particularly its sub-assumption, will be discussed in Chapter III.

#### Limitations of the Study

This study utilized data collected by other researchers and offices of Michigan State University. This was an advantage in that it removed the possibility that the students on whom the data were collected acted differently because they were involved in this study--that is, that a Hawthorne effect could explain the results of the study. And the problems of test construction, validation and administration, if existing data had not been available, would have made this study impracticable if not impossible to conduct.

But the nature of the data and its collection also presented problems. First, and most obviously, the use of existing data limited the variables which could be studied. While this would have been a more severe limitation had the data been less extensive and relevant, the scope of this study was nonetheless restricted to those variables which

others have thought were related to achievement in college.

Secondly, the data were sometimes imprecise for the needs of this study. There are a number of reasons for this imprecision. In some cases the purpose of the study for which the data were originally collected did not require precision. In other cases the data lost precision in making them suitable for this study, as when a variable was dichotomized to correlate it with course achievement. And finally, imprecision resulted from having to use statistical tests which allowed for the lack of knowledge of the population parameters for the learner variables used in the study.

The use of existing data was also limiting in requiring a theoretical basis for the study compatible with the data, rather than the converse. It is important to recognize that even the principal concern of the study, academic motivation, was operationalized, and generally conceptualized, in terms of the data which were available.

Similarly, the study was limited to an investigation of internal characteristics of students, and of what might be termed "Background" variables. The study does not deal directly with such additional variables as health during the course, and peer group attitudes toward instructional television. To some extent these and similar aspects of the learning situation are functions of the variables used in this study, but their relative importance and relationship are not determinable.

### Summary

Closed-circuit instructional television is assuming an important role in meeting needs in higher education caused by student population growth combined with staffing shortages. Research indicates students are able to learn from television as well as they do from conventional face-to-face instruction. But it is not known if, and in what ways, non-intellectual characteristics of students interact with the use of television in higher education.

These non-intellectual characteristics of learners are the focus of this study. Data will be examined to determine if fifty learner variables are related to achievement differently in TV and face-to-face sections of a freshman course in American Thought and Language at Michigan State University.

In organizing the study and in analyzing the data, several assumptions were made:

1. Academic motivation is a construct which is useful, definable, and measurable.

2. Academic motivation is multivariate in nature, comprised of personality, emotional and expectation factors which are dependent on all past experiences of the individual.

- 2a. Academic motivation is an internal state which develops over time, endures once developed, and is brought to the learning situation.

2b. In a given learning situation, environmental conditions, as perceived by the learner, provide external motivational factors which are immediate, transitory and unique to the given learning situation.

2c. In a given learning situation with external motivational factors held constant, individuals will differ in achievement according to their different levels of academic motivation and native mental ability (aptitude).

3. The learning environments which are perceived by students in the TV group and the face-to-face group will be different, will be consistent within each group, and will systematically and differentially interrelate with internal, academic motivation.

4. The TV and face-to-face groups are assumed to equally and fairly represent the total 1965 freshman class of Michigan State University.

4a. In analyzing the data of this study, the TV and face-to-face groups are assumed to be random samples of the total 1965 freshman class.

It was noted that the use of existing data limited the scope of the study, and determined to some extent the means used to analyze the data.



## CHAPTER II

### REVIEW OF RESEARCH

This chapter reviews three areas of research related to the present study: first, research which has compared instruction by television with conventional, face-to-face instruction; next research which has considered the relationship of learner characteristics to the use of television; and third, research in various aspects of academic motivation.

#### Research Comparing CCTV and Classroom Instruction

In the past fifteen years many comprehensive reviews of ITV research have been published. Since the first published review of ITV research in 1953 by Finn,<sup>1</sup> reviews have been published by Kumata in 1956<sup>2</sup> and 1960,<sup>3</sup> Barrow and Westly in 1958,<sup>4</sup> Holmes in

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<sup>1</sup>James D. Finn, "Television and Education: A Review of Research," Audiovisual Communication Review (Spring, 1953), 1:106-26.

<sup>2</sup>Hideya Kumata, An Inventory of Instructional Television Research (Ann Arbor, Mich.: Educational Television and Radio Center, 1956).

<sup>3</sup>Hideya Kumata, "A Decade of Teaching by Television," in Schramm, (ed.), The Impact of Educational Television (Urbana, Ill.: University of Illinois Press, 1960, pp. 176-92.

<sup>4</sup>Lionel C. Barrow and Bruce H. Westley, Television Effects: A Summary of the Literature and Proposed General Theory. Research Bulletin No. 9 (Madison, Wis.: University of Wisconsin Television Laboratory, 1958).

1959,<sup>5</sup> Allen in 1960,<sup>6</sup> Schramm in 1962,<sup>7</sup> and Finn, Bolvin and Perrin in 1964.<sup>8</sup> Unpublished reviews include those completed by Stickell in 1963<sup>9</sup> and by Smith in 1964.<sup>10</sup>

The summaries cited above are consistent in finding that most ITV research has attempted to determine if television instruction is better or worse than other methods of teaching, and generally the researchers have found "no significant difference."

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<sup>5</sup>Presley D. Holmes, Jr., Television Research in the Teaching-Learning Process (Detroit: Wayne State University, 1959).

<sup>6</sup>William H. Allen, "Audio-Visual Communication," in C. Harris, (ed.) Encyclopedia of Educational Research (New York: The Mac-Millan Co., 1960).

<sup>7</sup>Wilbur Schramm, "What We Know About Learning From Instructional Television," in Schramm (ed.), Educational Television: The Next Ten Years (Stanford, Cal.: The Institute for Communication Research, Stanford University, 1962), pp. 52-76.

<sup>8</sup>James D. Finn, Boyd M. Bolvin, and Donald G. Perrin, A Selective Bibliography on New Media and Instructional Technology. Instructional Technology and Media Project, Staff Paper Number One (Los Angeles: University of Southern California, 1964).

<sup>9</sup>David W. Stickell, "A Critical Review of the Methodology and Results of Research Comparing Televised and Face-to-Face Instruction" (unpublished doctoral dissertation, Pennsylvania State University, University Park, Pa.: 1963).

<sup>10</sup>Mary Howard Smith, "Uses of Television in Higher Education" (unpublished doctoral dissertation, New York University, New York, 1964).

In his comprehensive summary of ITV research conducted in 1962, Schramm summarized the major findings of 100 studies which had been conducted at the college level.<sup>11</sup> Table 3 indicates the major findings of these studies grouped according to the subjects which had been taught by television.

TABLE 3  
STUDIES COMPARING TV AND CONVENTIONAL CLASSES AT THE  
COLLEGE LEVEL IN VARIOUS SUBJECT MATTER AREAS  
(Adapted from Schramm.)

Results	Math	Science	Social Studies	Humanities, History, Lit., Arts	Language Skills	Health Safety	Total
TV	0	1	1	0	0	1	3
NSD	4	26	24	11	12	7	84
TV	0	1	4	3	1	4	13
Total	<u>4</u>	<u>28</u>	<u>29</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>100</u>

Two early studies in college teaching by television are especially relevant to the present study. From 1954 to 1957 Carpenter and Greenhill investigated the use of closed-circuit television teaching

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<sup>11</sup>Schramm, op. cit., p. 54.

courses at the Pennsylvania State University.<sup>12, 13</sup> And during this period Macomber and Siegel compared various instructional procedures at Miami University in Ohio, one of which was closed-circuit television.<sup>14</sup>

The Pennsylvania State University investigation compared TV and face-to-face instruction in more than 60 courses taught during three academic years. Among the concerns of Carpenter and Greenhill were:

1. Learning and attitudes of students in large and small TV rooms compared with large and small conventional classrooms.
2. Retention of factual material in TV as compared with face-to-face classes.
3. Effects of varying amounts and kinds of supervision in TV classes.

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<sup>12</sup>C. Ray Carpenter and Leslie P. Greenhill, An Investigation of Closed-Circuit Television for Teaching University Courses. Instructional Television Research Project Number One. (University Park, Pa.: Pennsylvania State University, July, 1955).

<sup>13</sup>C. Ray Carpenter and Leslie P. Greenhill, An Investigation of Closed-Circuit Television for Teaching University Courses. Report Number Two: The Academic Years 1955-1956 and 1956-1957. (University Park, Pa.: Pennsylvania State University, 1958).

<sup>14</sup>F. Glenn Macomber and Lawrence Siegel. Final Report of the Experimental Study in Instructional Procedures. (Oxford, Ohio: Miami University, January, 1960).

4. Absenteeism in TV classes under conditions of required and optional lecture attendance.<sup>15</sup>

They found no significant difference in learning in any comparison. Attitudes were dependent on the course and the instructor, although in comparisons in which a consistent difference was found, conventional instruction was favored over TV instruction. Class absences were not affected by the use of television.<sup>16</sup>

At Miami University, Macomber and Siegel made 26 comparisons between TV and regular classes during a three and a half year period. Four significant differences in achievement were found, three favoring control (face-to-face) sections and one favoring a TV section.<sup>17</sup> Macomber and Siegel also investigated the effectiveness of large group face-to-face instruction in comparison with small classes. They concluded that, "with few exceptions, large group instruction (including TV) was as effective as was small group (conventional) instruction."<sup>18</sup>

In their investigation of student attitudes toward large group

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<sup>15</sup>Carpenter and Greenhill (1958), op. cit., pp. 2-9

<sup>16</sup>Carpenter and Greenhill (1958), op. cit., pp. 12-23

<sup>17</sup>Macomber and Siegel, op. cit., p. 6.

<sup>18</sup>Ibid.

instruction, Macomber and Siegel concluded:

Students in the TV and in the large non-televised sections tended, in general, to rate the course content somewhat less favorably than did students in the control sections of these same courses. Exceptions to this generalization were relatively infrequent.<sup>19</sup>

Several studies comparing TV and conventional classes are noteworthy because they involved CCTV at Michigan State University.

Harcus reported the results of a questionnaire administered in the Fall, 1961, to Michigan State University students viewing CCTV.<sup>20</sup> Although students were very favorable toward televised instruction (80% believing they learned more in the course than if TV had not been used), nearly half the students (40%) reported they missed the stimulation provided by the physical presence of the instructor.<sup>21</sup>

Wessel examined the use of the Michigan State University CCTV systems to teach Physical Education and Social Dance in the 1961-1962 school year.<sup>22</sup> She found that "students, in general, tended to rate the

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<sup>19</sup>Ibid.

<sup>20</sup>Leslie F. Harcus, "The Use of Closed-Circuit Television for Teaching Veterinary at Michigan State University from September, 1955, Through January, 1963" (unpublished Master's thesis, Michigan State University, East Lansing, Mich., 1963), p. 3.

<sup>21</sup>Ibid., p. 72

<sup>22</sup>Janet A. Wessel, Teaching Physical Education by Closed-Circuit Television, Education Research Report Number 12 (East Lansing, Mich.: Michigan State University, 1963).

effectiveness of the presentation favorably".<sup>23</sup> Television was as effective as non-television instruction in teaching Physical Education as gauged by scores earned on objective portions of the final examination, but students in television sections tended to rate the course content less favorably than did students in non-television sections.<sup>24</sup>

Davis and Johnson during the 1965-1966 school year evaluated "Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms."<sup>25, 26</sup> Their major findings, as extracted from the final report of their evaluation, included the following:

1. The overall distribution of grades for students who saw lectures live was not significantly different from students who saw lectures on TV.
2. Questions dealing with interest and stimulation revealed no significant difference between those who saw the lectures live and those who viewed the lectures in a television classroom.

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<sup>23</sup>Ibid., p. 3.

<sup>24</sup>Ibid., p. 6.

<sup>25</sup>Robert H. Davis and F. Craig Johnson, An Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms, Project Report No. 201, (East Lansing, Mich.: Educational Development Program, Michigan State University, January, 1966).

<sup>26</sup>Robert H. Davis and F. Craig Johnson, Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms, Project Report No. 202, (East Lansing, Mich.: Educational Development Program, Michigan State University, May, 1966).

3. Students in television classrooms apparently did not feel they had a satisfactory opportunity to meet with their instructors outside of class and felt they would have done better in the course if it had been easier to discuss problems with the course lecturer.
4. Students in television classrooms had difficulty seeing lecture materials, especially in mathematics and science courses.
5. In the fall term, lectures did not hold the attention of students in television classrooms as well as the same lectures delivered in the lecture hall live.
6. Students who viewed the course lectures in a TV classroom did not perceive the purpose of the lectures differently from students who saw the lectures live.<sup>27</sup>

ITV Research Comparing Learner Characteristics  
With Achievement

Although media specialists have been concerned with the questions "Who learns best by television?"<sup>28</sup> and "Is there any kind of student who profits more than other kinds from instructional television?",<sup>29</sup> the problems inherent in investigations of the interactions of personality and motivational variables with instructional methods have deterred many investigators from researching such questions. Much ITV

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<sup>27</sup>Ibid., pp. 10-15.

<sup>28</sup>Kumata (1956), op. cit., p. 14.

<sup>29</sup>Schramm, op. cit., p. 61.



research has examined the relationship of one learner variable, mental ability, to the use of television for instruction, primarily because mental ability has been a control variable in the research. Yet, as Schramm states. "the data are muddy."<sup>30</sup> Schramm supports his conclusion by tabulating seven studies in which mental ability was an independent variable:

Fritz, 1952. Military subjects at Fort Monmouth. Divided radio electronic students into high and low aptitude groups. Some of each group were taught by TV. Found no significant difference in scores of TV and non-TV groups when equated for ability.

Kanner, et al., 1954. Split both TV and non-TV groups of basic trainees at Camp Gordon into high and low aptitude groups. N. s. d. in high groups, but 10 of 17 tests in low group favored TV; other 7 tests n. s. d.

Williams, 1954. Taught four groups of students at University of Toronto by TV, radio, lecture and reading assignments, respectively. TV higher than lecture in high and low ability groups, but equal in average group.

Kumata, 1958. Michigan State University students. Unable to reproduce Kanner's finding of superiority of TV instruction for low ability students.

Seibert, 1958. Purdue University students in English composition. Found that low ability TV students compared less favorably with control group than did high ability TV students.

Seibert, 1958. Purdue University students in freshman mathematics. No important interactions between mental ability and method of instruction.

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<sup>30</sup>Ibid., p. 61.

Macomber and Siegel, 1960. Miami University students in educational psychology, economics, physiology, zoology, and government. Breaking both TV and control groups by quartiles on mental ability, they found 1 significant difference out of 4 in top quartile--this in favor of TV group. In bottom quartile, found 2 significant differences out of 4 in favor of TV, 1 in favor of control. Breaking the groups by halves on mental ability, they found no significant differences out of 10 in the upper, 2 significant differences out of 10 in the lower half. Both of these were in favor of the control group.<sup>31</sup>

Additional studies in which mental ability was examined are those by Wessel at Michigan State University and Klapper at New York University.

Investigating the use of television to teach physical education, Wessel found no significant differences comparing high and low ability students (based on CQT scores) for acceptability of television.<sup>32</sup>

Klapper grouped students in a college composition course into three ability levels according to pretest scores. Gains on the post-test instruments (objective tests and writing exercises) were highest at the lowest ability level, decreasing as ability level went up.<sup>33</sup>

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<sup>31</sup>Ibid., p. 62.

<sup>32</sup>Wessel, op. cit., p. 3.

<sup>33</sup>Hope L. Klapper, Closed-Circuit Television as a Medium of Instructions at New York University, 1956-1957, (New York, New York University, 1958).

However, Klapper does not report any control for ceiling effects, and her results could be artifacts of her design.

Holmes, in his doctoral dissertation, reviewed and catalogued ITV research published prior to the end of 1958.<sup>34</sup> Using communication models, Holmes established seven categories for analyzing the research:

1. The Content, message, or stimulus materials.
2. The Communication Potential, or the possibilities for interaction between individuals, the teacher and student.
3. The Situation or environment.
4. The communicator, encoder, or teacher.
5. The listener, decoder, or student.
6. The effects, or learning.
7. Results.<sup>35</sup>

In one section of his study Holmes examined "the learning of facts and information on the basis of differences between students, to determine if there are certain types of individuals who might benefit more from one type of Communication condition than another."<sup>36</sup> Holmes Summarized 20 studies which examined the relationship of intelligence to information gain:

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<sup>34</sup>Holmes, op. cit., p. 6.

<sup>35</sup>Ibid., p. 9.

<sup>36</sup>Ibid., p. 49.

In summary of this section, it appears that there is conflicting evidence in support of the contention that low students show greater information gain as a result of having information presented to them by means of television.<sup>37</sup>

In studies which compared sex and information gain:

There seems to be little evidence which would indicate that one sex does better than the other . . . due to receiving instruction under television or conventional conditions.<sup>38</sup>

Finally, two studies are singled out for their pertinence to the present study. The first, a study by Janes, found a positive relationship between preference for televised instruction and pre-existing student personality traits, particularly self-confidence.<sup>39</sup>

In the second, Mullin found motivated high school students scored higher on a criterion examination than unmotivated students.<sup>40</sup>

Manipulating motivation by having some eleventh grade subjects compete for an award of monetary value, Mullin found motivated students

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<sup>37</sup>Ibid., p. 54

<sup>38</sup>Ibid.

<sup>39</sup>Robert W. Janes, "Pre-existing Attitudes of College Students to Instructional Television," Audiovisual Communication Review, 13: 335, Fall, 1964

<sup>40</sup>Daniel W. Mullin, "Retention as a Function of Motivation and Environment in Educational Television on Secondary School Level" (unpublished doctoral dissertation, University of Michigan, Ann Arbor, Michigan, 1957).

both at home and in a classroom learned more than unmotivated students. Although environment differences were not significant, Mullin interprets his findings as suggesting that the unmotivated student learns better in a classroom and the motivated student learns better at home.<sup>41</sup>

Despite evidence of concern for the effects of preexisting characteristics of students on learning from instruction television, one must agree with Holmes that:

There is virtually no conclusive evidence about either the instructor or the student which isolates certain types of individuals as more receptive to instructional television.

In regard to the attributes of students, the question of whether or not television favors a particular intelligence level is still unanswered.<sup>42</sup>

#### Research in Academic Motivation

Much of the interest in academic motivation in the past decade can be traced to the work of McClelland and his associates in the late 1940's.<sup>43</sup> Their book, The Achievement Motive, summarizes the results of five years of intensive research into

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<sup>41</sup>Ibid., abstract, p. 2.

<sup>42</sup>Holmes, op. cit., p. 85.

<sup>43</sup>David C. McClelland, John W. Atkinson, Russell A. Clark, and Edgar L. Lowell, The Achievement Motive, (New York: Appleton-Century-Crofts, Inc., 1953), p. 1.

the nature of achievement motivation.

During this research McClelland and his team developed a theory of motivation based on the notion that motives are learned, developing out of repeated affective experiences connected with certain types of situations and types of behavior:

In the case of achievement motivation, the situations should involve "standards of excellence," presumably imposed on the child by the culture, or more particularly by the parents as representatives of the culture, and the behavior should involve either "competition" with those standards of excellence or attempts to meet them which, if successful, produced positive affect or, if unsuccessful, negative affect. It follows that those cultures or families which insist that the child be able to perform certain tasks well by himself-- such cultures or families should produce children with high achievement motivation. <sup>44</sup>

In addition to competition with a standard of excellence, McClelland et al. hypothesize that Need for Achievement (N-achievement) is composed of a desire for long-term involvement with achievement goals and accomplishment of unique tasks. <sup>45</sup>

McClelland et al. were concerned with an individual's generalized need for achievement, not his need to achieve academically. A given individual might or might not direct his N-achievement drive into academic pursuits. It is conceivable, for example,

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<sup>44</sup> Ibid., p. 275.

<sup>45</sup> Ibid., pp. 110-113.

that a student with high N-achievement might receive low grades because of his participation in extra-curricular activities in which he satisfies his need for successful achievement.<sup>46</sup>

Pierce, for example, in his study of "Sex Differences in Achievement Motivation,"<sup>47</sup> found McClelland's test for N-achievement unrelated to academic achievement in girls. He writes:

This leads the writer to believe that achievement motivation in girls is related to motivation to reach adulthood early, rather than to motivation to achieve academically. For boys it is related to college going and academic achievement. Thus, in this area we find a sex difference operating which has not been taken into account by educators and as yet not fully understood.<sup>48</sup>

Farquhar believed McClelland's basic ideas regarding achievement motivation were applicable to the school setting, but that somewhat different instrumentation was needed to measure

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<sup>46</sup>In research conducted for his doctoral dissertation, George Paulus found that student activist leaders at Michigan State University are very often highly intelligent, often national merit scholars, yet sometimes have barely acceptable grade point averages. (Reported in personal discussion.)

<sup>47</sup>James V. Pierce, Sex Differences in Achievement Motivation of Able High School Students, (Quincy, Ill.: University of Chicago Quincy Youth Development Project, December, 1961).

<sup>48</sup>Ibid., p. 48.

academic motivation. <sup>49</sup> Farquhar adapted and extended McClelland's hypotheses regarding the components of N-achievement to postulate "A continuum of achievement motivation with the low motivation or N-achievement being opposite in composition from that advocated by McClelland and associates."<sup>50</sup> Farquhar summarizes his "Polar Theory of High and Low Academic Achievement Motivation" in the following table:

TABLE 4  
SUMMARY OF POLAR THEORY OF HIGH AND LOW  
ACADEMIC ACHIEVEMENT MOTIVATION  
(FROM FARQUHAR. <sup>51</sup>)

<u>High Academic Achievement Motivation</u>	<u>Low Academic Achievement Motivation</u>
1. Need for Long-Term Involvement	1. Need for Short-Term Involvement
2. Need for Unique Accomplishment	2. Need for Common Accomplishment
3. Need to compete with a Maximal Standard of Excellence	3. Need to compete with a Minimal Standard of Excellence

<sup>49</sup> William W. Farquhar (Project Director), Motivation Factors Related to Academic Achievement. Cooperative Research Project 846. (East Lansing, Mich.: Michigan State University, January, 1963).

<sup>50</sup> Ibid., p. 9.

<sup>51</sup> Ibid., p. 10.



These continuums were used to construct four instruments designed to measure academic motivation:

1. Word Rating List
2. Human Trait Inventory
3. Generalized Situational Choice Inventory
4. Preferred Job Characteristics Scale<sup>52</sup>

The instruments were administered to over 650 low and high motivated eleventh grade students (operationally defined in terms of grade-point averages (GPA) below and above the GPA predicted on the basis of obtained intelligence scores), and items which differentiated between the students (validated items) were combined into a single instrument labeled the "Michigan M-Scales".

Several doctoral dissertations have utilized the M-Scales in attempting to identify characteristics of high and low motivated students.

McDonald administered the M-Scales to high school seniors statistically defined as over- and under-achievers.<sup>53</sup> Using weighted indices of "Education of parents" and "occupation of father" to derive a single integer representing socio-economic status, McDonald found that over-achievers came from high socio-

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<sup>52</sup>Ibid., p. 179.

<sup>53</sup>Keith Henry McDonald, "An Investigation Into The Relationship of Socio-Economic Status to an Objective Measure of Motivation: The Michigan M-Scales (unpublished doctoral dissertation, Michigan State University, East Lansing, Mich., 1962).

economic families, while under-achievers are found in no peculiar socio-economic status.

Anderson studied the relationships among academic motivation, level of aspiration, level of expectation, and gain or loss in achievement in a college reading improvement situation.<sup>54</sup> He found that the M-Scales and measures of aspiration and expectation were correlated with each other and with achievement in a college reading improvement program.

Johnson and Green in their doctoral dissertations administered M-Scales to minority groups. Johnson<sup>55</sup> found American Indian students differed from Caucasian students in Grade Point Averages, aptitude test scores and total M-Scale scores. Green<sup>56</sup> found similar results comparing Negro and Caucasian students, although only one

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<sup>54</sup>Jack O. Anderson, "A Study of the Relationships Among Academic Motivation, Level of Aspiration, Level of Expectation, and Gain or Loss in Achievement in a College Reading Improvement Situation" (unpublished doctoral dissertation, Michigan State University, East Lansing, Michigan, 1962).

<sup>55</sup>Vandel C. Johnson, "An Assessment of the Motivation Factor in Indian Students" (unpublished doctoral dissertation, Michigan State University, East Lansing, Mich., 1963).

<sup>56</sup>Robert L. Green, "The Predictive Efficiency and Factored Dimensions of the Michigan M-Scales for Eleventh Grade Negro Students" (unpublished doctoral dissertation, Michigan State University, East Lansing, Mich., 1962).

sub-test of the M-Scales differentiated the two groups of students.

Although instruments such as the M-Scales have the advantage of offering a theoretical basis for analyzing the non-intellectual factors affecting achievement, some researchers have preferred to look more directly at student characteristics as they are related to academic achievement.

McDermott in a study similar to the present investigation in many respects investigated the relationship of twenty selected factors to success or failure in a freshman Communication Skills course.<sup>57</sup> She found that only three factors, class participation, class responsibility, and class attendance, significantly discriminated between "successful" and "unsuccessful" communication skills students.<sup>58</sup>

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<sup>57</sup>Frances M. McDermott, "A Study of Some Selected Factors That Contribute to Success or Failure in Freshman Communication Skills" (unpublished doctoral dissertation, Michigan State University, East Lansing, Mich., 1963).

<sup>58</sup>Other factors were: (1) Size of high school; (2) Years of H. S. English taken; (3) Language background in home; (4) Occupation of father; (5) Employment of mother; (6) Newspaper reading habits; (7) Magazine reading habits; (8) Book reading habits; (9) Likes and dislikes of school subjects; (10) Attitude toward college education; (11) Time spent in classes and laboratories; (12) Time spent in study; (13) Time spent in sleep and at meals; (14) Time spent in gainful employment; (15) Time spent in scheduled activities; (16) Time spent in non-scheduled activities; (17) Survey of Study Habits and Attitudes.

Although McDermott believed there was "no conclusive evidence that the background of the student made any significant difference between the successful and unsuccessful in freshman Communication Skills classes,"<sup>59</sup> her methodology could account for her lack of significant findings.

First, McDermott dichotomized her subjects according to grades received to identify successful and unsuccessful students: "These who received C or better were considered successful, and those who earned D or less were considered unsuccessful."<sup>60</sup> Second, all measures of subjects were dichotomized (presumably on the median or mean) and tested by Chi square. Third, measures were obtained as the course was being conducted. Finally, the college used in the study assigned each entering freshman to one of three different Communication Skills classes according to his score on an English aptitude and abilities test.<sup>61</sup>

Thus McDermott used imprecise measuring techniques and statistical tests with homogeneously grouped students who knew they were being studied. These factors in combination make it

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<sup>59</sup>Ibid., p. 95.

<sup>60</sup>Ibid., p. 37.

<sup>61</sup>Ibid., pp. 6, 40, 41.

exceedingly difficult to detect differences which might have in fact existed in her population.

Other studies suggest particular non-intellectual variables which are related to achievement in college courses. The size of the high school from which students graduate was found by Lamberty to be related to success in college.<sup>62</sup> He found that students from large high schools tend to demonstrate higher scholastic achievement at the University of Nebraska than students from small schools.

Fisher found that the relative size of a student's high school graduating class, added to mental aptitude scores, significantly improved grade point average predictions.<sup>63</sup> The prediction was further improved by adding the student's senior class academic ranking.

Long compared six variables with achievement for men and women freshman students at the Norfolk College of William and

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<sup>62</sup>Earlyon J. Lamberty, "College Achievement in Relation to Size of High School From Which Graduated", (unpublished doctoral dissertation, The University of Nebraska, Lincoln, Neb., 1964).

<sup>63</sup>James L. Fisher, "Factors Affecting Academic Success", (unpublished doctoral dissertation, Northwestern University, Evanston, Illinois, 1964).

Mary: High School GPA, School and College Aptitude Tests (three sub-tests), the Kuder Preference Test, and the Guilford-Zimmerman Temperament Survey.<sup>64</sup> The last two non-academic factors accounted for 25 percent of the variability in college grade-point averages. Personality factors were more important for men than for women.

McQuary factor-analyzed data on twenty-three variables assumed to be related to the scholastic achievement of male freshmen at the University of Wisconsin.<sup>65</sup> His variables, and the way in which they factored, are summarized in the following table:

TABLE 5  
NON-INTELLECTUAL FACTORS RELATED  
TO ACADEMIC ACHIEVEMENT,  
ACCORDING TO MCQUARY

- 
1. Academic Achievement Factor
    - a. Grade points earned in college
    - b. Credits earned during first semester
    - c. High school percentile rank
    - d. Vocabulary score
    - e. English (reading) comprehension score
    - f. Reading speed

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<sup>64</sup>John M. Long, "The Prediction of College Success From a Battery of Tests and From High School Achievement". (unpublished doctoral dissertation, The University of Virginia, Charlottesville, Virginia, 1959).

<sup>65</sup>John P. McQuary, "Some Relationships Between Non-Intellectual Characteristics and Academic Achievement," The Journal of Educational Psychology, 1953, 44:215-228.

TABLE 5--Continued

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- 
- g. ACE linguistics score
  - h. ACE quantitative reasoning score
  - 2. Social-Class Intelligence Factor
    - a. A foreign-born parent
    - b. Education level of mother
    - c. Education level of father
  - 3. Participating Urban Scholar Factor
    - a. High school extra-curricular participation
    - b. Size of community
    - c. High school percentile rank
    - d. Grade-points earned in college
  - 4. Social extroversion factor
    - a. High school extra-curricular participation
    - b. Introversion-extroversion
  - 5. Academic and Financial Security Factor
    - a. Hours studied per week
    - b. Number of siblings in family
    - c. Occupational level of father
  - 6. Introvertive-reader factor
    - a. High school average
    - b. Position among siblings in family
    - c. Health
    - d. Vocational certainty
- 

In summarizing his data, McQuary suggest his factor 3, by "grouping high-school rank, size of community, high-school extra-curricular participation, and grades, suggests a somewhat different from the usual and possibly supplementary approach to predicting

academic success."<sup>66</sup>

Friesen examined fifty-two variables in relation to grades in English Composition I at Kansas State University.<sup>67</sup> The variables represented: (1) scholastic aptitude test scores, (2) social-personal background, (3) educational plans and vocational choices, and (5) attitudes toward the study and use of the language arts. Although approximately half of the non-intellectual variables were significantly related to obtained course grades (at the .01 level), a majority of these variables were also significantly related to predicted grades (based on a verbal ability index), which suggests that intellectual factors may account for the relationship of the non-intellectual factors to earned grades (i. e. , fewer or no differences would have been obtained had intelligence been held constant).

#### Summary

The research in both instructional television and non-intellectual factors in achievement indicates that some types of

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<sup>66</sup>Ibid. , p. 227.

<sup>67</sup> Walter S. Friesen, "A Descriptive Study of Freshman Performance in English Composition I at Kansas State University, 1961, in Relation to Fifty-Two Variables" (unpublished doctoral dissertation, Colorado State College, Fort Collins, Colorado, 1963).



students tend to perform better in school than other equality bright students. The ITV research further suggests that students matched on mental ability sometimes learn differentially by different teaching methods. The research only begins to suggest what factors account for different achievement in TV and non-TV classes when mental ability is held constant.

The literature in the area of motivation suggests a few of the non-intellectual variables which may be systematically related to achievement, any of which could interact with the use of television in a college course.

## CHAPTER III

### PROCEDURES

The major focus of this study is on the relationship between selected learner variables and student achievement. More specifically, the study looks at students in two groupings, those who viewed lectures by TV and those who received lectures face-to-face with the instructor, and examines the relationship of fifty variables, representing different aspects of the learners' past experience, to achievement in these two groups.

A major problem often found in studies in which many psychological and biographical variables are examined is the extensive testing required to gather the data. Administration of tests becomes a problem, and the data often reflect the fact subjects know they have been singled out for an experiment--the so-called Hawthorne effect.

These problems were reduced in this study by using data collected on incoming freshmen by five different offices on the Michigan State University campus. The data collected by these offices provided indices for fifty different characteristics of students which research or logic suggested might be related to achievement in a college course. These variables were then compared with achievement in ATL 111 in two different ways: (1) by dividing each treatment group into sub-groups of high and

low achievers and comparing corresponding sub-groups for differences on the variables: and (2) by comparing the correlations of the variable with course grades in the two treatment groups.

The remainder of this chapter describes the sample used in the study, each variable which was compared with course achievement, and the statistical methods employed to compare the variables with achievement in the two teaching methods (treatment groups).

#### Description of Treatment Groups

Students included in the two treatment groups were those freshmen at Michigan State University in the fall term, 1965, who:

1. Were enrolled in one of the fourteen experimental sections of ATL 111 which received lectures originating in the Giltner Lecture Hall.
2. Completed, during freshman orientation, the Michigan State University "Student Inventory" questionnaire.
3. Completed, during freshman orientation, the Michigan State University "College Interest Inventory."
4. Completed the "Orientation Test Battery" consisting of the following tests:
  - a. The "College Qualification Tests"
  - b. The "MSU English Placement Test"
  - c. The "MSU Reading Test".
5. Completed, near the conclusion of the fall term, the "MSU-EDP Course Questionnaire."

6. Completed the final examination in ATL 111 (i. e. , received a final grade in the course).

A total of 232 students completed all the above tests, 172 in ten TV sections and 60 in four face-to-face sections.

Although the students used in the study were not randomly selected and randomly assigned to the treatments, it is reasonable to assume they are typical of the total freshman class entering Michigan State University in the fall of 1965. This assumption would be less tenable if students had known they were enrolling in a TV or face-to-face section of ATL 111. However, television was used to teach selected sections of ATL 111 for the first time in 1965, and the TV sections were not identified as such in any way in the schedule of classes. It is reasonable to assume, therefore, that students selected sections without considering the way in which they would receive the lectures.

To test the validity of the assumption that the treatment groups were comparable at the beginning of the term, a comparison of the two groups was made on the variables obtained from tests administered before the beginning of the school year.<sup>1</sup> This comparison is summarized in Table 6.

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<sup>1</sup>The nine variables not included in this comparison are those obtained from the EDP Course Questionnaire and the records of the Registrar (see the next section).

TABLE 6.  
COMPARISON OF TV AND FACE-TO-FACE GROUPS  
ON 41 LEARNER VARIABLES MEASURED  
PRIOR TO MATRICULATION AT  
MICHIGAN STATE UNIVERSITY,  
SEPTEMBER, 1965.

	TV Group Mean (s. d. )	F-to-F Group Mean (s. d. )	Significance at .05 level <sup>a</sup>
Age	1.779 <sup>b</sup> (.49)	1.950 <sup>b</sup> (.62)	NSD
Sex	49.4% Males	46.7% Males	NSD <sup>c</sup>
Nativity of parents	2.808 (.49)	2.767 (.56)	NSD
Size of home town	3.488 (1.22)	3.533 (1.20)	NSD
Size of gradu- ating class	3.919 (1.03)	3.917 (1.11)	NSD
Type of high school	91.0% Public	86.7% Public	NSD <sup>c</sup>
Standing in high school graduating class	1.291 (.55)	1.550 (.74)	Sig.
Participation in high school activities	1.576 (.58)	1.800 (.63)	Sig.
Church attendance	1.826 (.94)	1.767 (.91)	NSD

TABLE 6--Continued

	TV Group Mean (s. d. )	F-to-F Group Mean (s. d. )	Significance at .05 level <sup>a</sup>
Religious preference	62.2% Prot.	50.0% Prot.	NSD <sup>c</sup>
Education of father	5.070 (2.04)	5.683 (2.36)	NSD
Education of mother	4.907 (1.77)	4.883 (1.82)	NSD
Occupation of father	5.930 (.250)	6.317 (2.44)	NSD
Working mother	37.1% Employed	25.0% Employed	NSD <sup>c</sup>
Years of college desired	4.477 (.71)	4.400 (.62)	NSD
Years of college actually expected	4.233 (.74)	4.150 (.71)	NSD
Attitude toward the intellectual	5.099 (.88)	5.283 (.88)	NSD
Preference for library research	5.570 (1.18)	5.500 (1.27)	NSD
Attitude toward school life	4.407 (1.03)	4.583 (.98)	NSD
Attitude toward out-of-class study	4.419 (1.01)	4.583 (1.05)	NSD

TABLE 6--Continued

	TV Group Mean (s. d. )	F-to-F Group Mean (s. d. )	Significance at .05 Level <sup>a</sup>
Desire for solitude	4.953 (.96)	4.600 (1.15)	Sig.
Academic anxiety	9.262 (1.37)	9.383 (1.62)	NSD
Preference for lab research	7.506 (1.16)	7.567 (1.37)	NSD
English ability	24.558 (5.86)	24.250 (5.62)	NSD
Plans for out- side job at MSU	40.7% Yes	40.0% Yes	NSD <sup>c</sup>
Who pays for schooling	86.7% Parents	80.3% Parents	NSD <sup>c</sup>
Expectation re- garding dating	1.907 (102)	1.800 (.73)	NSD
Expectations re- garding partici- pation in activities	2.215 (1.07)	2.033 (.88)	NSD
Expectations re- garding faculty contact	2.529 (.71)	2.333 (.88)	NSD
Expectations re- garding prejudice at MSU	2.384 (.60)	2.333 (.66)	NSD

TABLE 6--Continued

	TV Group Mean (s. d. )	F-to-F Group Mean (s. d. )	Significance at .05 level <sup>a</sup>
Literary interest	12.488 (3.37)	12.283 (4.14)	NSD
Intellectual aggressiveness	11.669 (2.07)	11.900 (2.21)	NSD
Self-concept of intellectual ability	12.145 (2.58)	12.300 (2.97)	NSD
High grade aspirations	9.878 (1.50)	9.900 (1.39)	NSD
Self-confidence in class situations	10.913 (1.64)	10.633 (1.78)	NSD
Interest in the theoretical or the abstract	4.820 (.92)	4.883 (1.03)	NSD
Non-utilitarian academic goals	7.244 (1.56)	7.400 (1.63)	NSD
Attitude toward extra-curricular activities in college	4.116 (1.08)	4.033 (1.23)	NSD
Desire for education to be practical	7.221 (1.34)	7.050 (1.80)	NSD
Reading ability	31.401 (6.64)	30.983 (7.66)	NSD



TABLE 6--Continued

	TV Group Mean (s. d. )	F-to-F Group Mean (s. d. )	Significance at .05 level <sup>a</sup>
Verbal ability	53.000 (10.73)	53.500 (12.15)	NSD
General information level	49.070 (9.33)	47.417 (9.49)	NSD
	$N_1 = 172$	$N_2 = 60$	

NOTES:

<sup>a</sup>Significance tested by t test except as noted.

<sup>b</sup>Means are responses to single or combined multiple choice items (see description of variables infra. ).

<sup>c</sup>Significance tested by the Chi square test.

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Three comparisons, "Standing in High School Graduating Class", "Participation in High School Activities", and "Desire for Solitude" are significant at the .05 level. However, in 41 comparisons we can expect five percent, or two in this case, to be statistically significant by chance occurrence. The assumption that the two groups are comparable appears tenable.

### Variables Examined in the Study

Data for this study were collected by five different offices or individuals at Michigan State University (identified below) during the summer and fall of 1965. The data from these sources were sorted and manipulated to produce fifty variables describing various aspects of the learners' backgrounds.

The particular variables which were finally selected were those which: (1) represented as many different aspects of the backgrounds and perceptions of the learners as possible; (2) research indicated were related to achievement, or logic suggested might be related; and (3) appeared to have relatively little correlation with other variables used in the study.

The above selection criteria resulted in three classifications of variables: (1) those clearly and specifically pertinent to the study; (2) those logically belonging, although not as yet shown by research to be related to academic achievement; and (3) a small additional group of variables which could have been related to course grades in this study, but which would not regularly be related to academic achievement -- sex of student, for example. Application of these procedures resulted in a total of 53 variables. Three variables were subsequently dropped because students did

not vary on the questionnaire items: (1) Housing plans at MSU; (2) Marital status; and (3) Expectations regarding homework at MSU in comparison with high school.

The variables are described below according to their sources:

A. Michigan State University Student Inventory

The MSU "Student Inventory" was administered to incoming freshmen as part of a continuing project at Michigan State University to chart differences in students over time. A similar questionnaire has been administered every four to six years to incoming students for the past two decades.

Data for 22 variables were obtained from the first two pages of this questionnaire (see Appendix I):

Variable 1: Age. (Item 2)

Four values: Under 18; 18; 19; 20 or over

Variable 2: Sex. (Item 1)

Two values: Male and female.

Variable 3: Nativity of parents. (Item 5)

Although the item originally had four values, responses were recoded for three values: both nativeborn (response 4); one native-born (responses 1 and 2); both foreign-born (response 3).<sup>2</sup>

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<sup>2</sup> Variables were re-coded when it was convenient to do so to allow for the assumption of intervality required by the Pearson product-moment correlation.

Variable 4: Size of home town. (Item 8)

Four values: farm; village, 250-2500 population; town, 2500-25,000 population; city, 25,000-100,000 population; city, over 100,000 population.

Variable 5: Size of graduating class. (Item 10)

Five values: under 25; 25 to 100; 100 to 200; 200 to 400; 400 to 1,000; over 1,000.

Variable 6: Type of high school. (Item 9)

Three values: public; parochial; private, non-parochial.

Variable 7: Standing within graduating class. (Item 11)

Four values: top quarter; second quarter; third quarter; bottom quarter.

Variable 8: Participation in high school activities. (Item 12)

Three values: very active; moderately active; not active.

Variable 9: Church attendance. (Item 4)

Four values: regularly; frequently; rarely; never.

Variable 10: Religious preference. (Item 18)

Five values: Catholic, Jewish, Protestant, None, Other.

Variable 11: Education of father. (Item 13)

Nine values: some grade school; completed grade school; some high school; completed high school; some technical or business school; some college; completed college; some graduate school; completed graduate or profession school.

Variable 12: Education of mother. (Item 14)

Nine values: Same as Variable 11.

Variable 13: Occupation of father. (Item 20)

In order that interval data could be assumed to permit the computation of correlations, responses to this item were recorded according to the prestige of the occupation, using the North-Hatt socio-economic classification system as modified by Haller.<sup>3</sup> This provided the following scale:

- 0 - Manual worker (response 1)
- 3 - Skilled labor (response 2)
- 4 - Barber (response 9)
- 5 - Homemaker (response 10)
- 6 - Business owner or employee (responses 3 and 6)
- 7 - Teacher (response 7)
- 7 - Farm owner (response 4)
- 8 - Executive or manager (response 5)
- 9 - Professional (response 8)

Variable 14: Mother housewife or employed. (Item 21)

Item was dichotomized for two values: mother housewife (response 10); mother employed (all other responses to item).

Variable 15: Desired education. (Item 6)

Five values: 1; 2; 3; 4 years of college; graduate or professional school.

Variable 16: Expected education. (Item 7)

Five values: 1; 2; 3; 4 years of college; graduate or professional school.

Variable 17: Plans for outside job at MSU. (Item 17)

Two values: Yes; no.

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<sup>3</sup>Reported in: William W. Farquhar (Project Director), Motivation Factors Related to Academic Achievement. Coop-Research Project 846 (East Lansing, Mich.: Michigan State University, January, 1963), pp. 100, 313-329.

Variable 18: Source of funds for education. (Item 15)

Items was dichotomized for two values: Parents; others.

Variable 19: Expectations regarding dating at MSU. (Item 32)

Item was recoded for three values: more in college; same as high school or no opinion; less in college.

Variable 20: Expectations regarding participation in activities at MSU. (Item 32)

Same values as Variable 19.

Variable 21: Expectations regarding contact with faculty at MSU. (Item 34)

Same values as Variable 19.

Variable 22: Expectations regarding prejudice at MSU. (Item 35)

Same values as Variable 19.

B. Michigan State University College Interest Inventory

The MSU "College Interest Inventory" is the latest form of an instrument being developed at Michigan State University by Dr. Arvo Juola. It is a "non-cognitive scale that is based upon attitude and values that students seem to hold for education and educational activities,"<sup>4</sup> used as a predictor of academic achieve-

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<sup>4</sup>Arvo E. Juola, "The AAPI: A Non-Cognitive Predictor of College Attainment (Paper delivered at a meeting of the American Educational Research Association, Chicago, February 24, 1961).

ment by selecting items on the basis of their power to differentiate between high and low achieving students.<sup>5</sup>

Data from two of the four scales contained in the experimental questionnaire (see Appendix II) were utilized in this study: (1) items B-1 through B-78 of Part I: "Academic Interests": and (2) all items from Part II: "Academic Attitudes".

Part I was utilized to obtain an index of pre-existing literary interest. Although items suggesting a literary interest are evident in reading the responses, final selection of items to represent the variable was based on a factor analysis of all 78 items.

Factor analysis is a statistical method for grouping similar items in a test instrument, or grouping other variables which a correlation matrix indicates are related. It attempts "to account for the inter-relationships in terms of some underlying 'factor', preferably fewer in number than the original variables."<sup>6</sup>

The actual procedures used to factor analyze the MSU Interest

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<sup>5</sup>Arvo E. Juola, "The Validity of an Academic Attitude Inventory Under Real and Facade Conditions" (Mimeo) (East Lansing, Michigan: Michigan State University, undated.). p. 1.

<sup>6</sup>A Glossary of Measurement Terms (Monterey, Calif.: California Test Bureau, undated).

Inventory were those described in Technical Report No. 31 of the Michigan State University Computer Laboratory<sup>7</sup> (principal axes solution. Varimax rotation, Kiel-Wrigley criterion requiring five variables with highest loadings, with an Eigenvalue threshold of 2.0, N = 371).

On the basis of the factor analysis, five items were selected to represent "literary interest":

Item B-60: Seek in literary works expressions of the dominant thought and feeling of their period. (.720; 2.46, .82)<sup>8</sup>

Item B-77: Read and study poetry, (.717; 2.50, .94)

Item B-31: Talk about poems in class. (.693; 2.44, .94)

Item B-24: Study the history of art. (.675; 2.67, .88)

Item B-12: Take a course in the modern novel. (.661; 2.29, .86)

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<sup>7</sup>A Williams, Factor Analysis (Factor A), Technical Report No. 31 (East Lansing, Mich.: Computer Institute for Social Science Research, Michigan State University, October 15, 1965.)

<sup>8</sup>Numbers in parentheses indicate: (factor loading; mean response, standard deviation). Factor loadings are for a three-factor solution.



These items were summed<sup>9</sup> to create:

Variable 23: Literary Interest.

In similar fashion, Part II, "Academic Attitudes", of the College Interest Inventory was factor analyzed to obtain hypothetical variables which could be considered aspects of self-concept and academic personality factors.

A fifteen factor solution<sup>10</sup> produced the variables which were used in this study:

Variable 24: Intellectual aggressiveness.

Five items were summed to produce this variable:<sup>11</sup>

Item C-36: I question statements and ideas expressed  
by teachers if I disagree with them. (-.657;  
1.97, .60)

Item C-85: I like to join in on heated discussions about  
controversial issues. (-.628; 2.18, .85)

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<sup>9</sup>It can be argued that simply summing across the items does not utilize all the information generated by the factor analysis. However, since the interest in this study is only to establish possible relationships between variables and achievement, and is not the development of psychological tests, it seemed reasonable to sum across selected items similar in factor loadings, mean responses, and spread of responses (standard deviations) without computation of item weights.

<sup>10</sup>Final solution for an Eigenvalue threshold of 1.0.

<sup>11</sup>See footnotes 7 and 8. As a rule the highest loaded items with like signs (to insure comparability and to avoid computer sub-routines) were selected, but in any case at least two meaningful items were selected.

- Item C-19: I like thinking about problems that are a challenge to even the specialists in the area. (-.627; 2.23, .68)
- Item C-56: I enjoy arguing with an instructor or superior. (-.563; 2.62, .72)
- Item C-30: I often question the accuracy of statements made in my textbooks or reference books. (-.532; 2.47, .61)

Variable 25: Self-concept regarding academic ability.

Five items were summed to produce this variable:

- Item B-81: I have been doing about as well in school as I am able. (.788; 2.61, .82)
- Item B-126: I usually work as hard as possible in all my classes. (.730; 2.55, .72)
- Item B-100: I probably study as hard or harder than most students in my classes. (.660; 2.34, .71)
- Item B-91: I feel that I drive myself harder than most people. (.497; 2.61, .60)
- Item B-125: My parents think I am doing quite well in school. (.437; 2.06, .60)

Variable 26: High grade aspirations.

Three items were summed to produce this variable:

- Item B-88: I am generally satisfied with grades as long as they are passing. (.684; 3.14, .69)
- Item B-79: I usually try for no more than a passing grade unless I really like the course. (.595; 3.36, .69)
- Item C-66: I usually don't try for a passing grade unless I really like the course. (.512; 3.43, .64)

Variable 27: Self-confidence.

Four items were summed to produce this variable:

- Item C-6: I wish I could make friends more easily  
(-.597; 2.42, .73)
- Item C-60: I believe that a highly educated person is  
often conceited. (-.517; 2.83, .73)
- Item C-17: I often pretend that I agree with a teacher  
after I see that he has made his mind up.  
(-.427; 2.86, .65)
- Item C-68: It slows me down to be with students who work  
much harder in given courses than I do.  
(-.310; 2.76, .64)

Variable 28: Theoretical orientation.

Two items comprise this variable:

- Item C-57: I dislike being in classes in which the  
speculative or abstract is emphasized rather  
than the concrete and tangible. (-.653; 2.52, .73)
- Item C-20: I am becoming more interested in the practical  
applications of a theory than in critical analysis  
of it. (-.436; 2.33, .64)

Variable 29: Non-utilitarian academic goals.

Three items were summed for this variable:

- Item C-16: The most important thing about college is  
preparing for a career. (-.675; 2.36, .75)
- Item B-90: My basic purpose in college is to prepare  
myself for a good job. (-.649; 2.12, .73)

Item C-45: I believe that a person must be highly specialized to really succeed after college. (-.360; 2.82, .63)

Variable 30: Attitude toward extra-curricular activities.

Two items represent this variable:

Item B-89: I believe the extra-curricular activities of college are every bit as important as academic activities. (-.649; 2.28, .78)

Item B-111: Learning to get along with other students is as important a part of school as acquiring knowledge. (-.517; 1.79, .59)

Variable 31: Desire for practical education.

Three items were summed to produce this variable:

Item B-108: I work best in courses I feel will be of value later. (.736; 2.20, .66)

Item B-84: My grades are markedly better in courses I see I will need later. (.598; 2.42, .67)

Item B-82: I am seldom interested in a class in which the material has little practical value. (.452; 2.64, .69)

Variable 32: Attitude toward the intellectual.

Two items were summed for this variable:

Item C-40 (Reverse scored): I feel that the artist and professor are more important to society than the businessman or manufacturer. (.581; 2.99, .56)

Item C-31: I think about the practical utility of a college education. (-.471; 2.12, .56)

Variable 33: Preference for library research.

Again two items were summed for the variable:

Item C-52: I prefer being in courses that require much library research. (.802; 2.77, .62)

Item C-42: I enjoy being in classes that require much library research. (.788; 2.77, .62)

Variable 34: Attitude toward school life.

Two items again represent the variable.

Item B-104: I usually find something of interest in every course I take. (.593; 2.12, .58)

Item B-86: I seem to enjoy school more than most people. (.366; 2.33, .75)

Variable 35: Attitude toward out-of-class study.

Two items also represent this variable:

Item B-127: I sometimes neglect other classes when I need to "bone up" for a certain test. (-.602; 2.18, .56)

Item B-119: My grades usually reflect the amount of time that I spent in study for that course. (-.429; 2.29, .72)

Variable 36: Desire for solitude.

Two items represent this variable:

Item C-62: I prefer to study alone rather than with other students. (.616; 1.97, .68)

Item C-53: (Reverse scored): I like to have people drop in on me when I am studying. (-.588; 3.10, .66)

Variable 37: Academic anxiety.

Three items were summed for this variable:

- Item C-69: I often freeze up when taking examinations.  
(-.557; 2.50, .87)
- Item C-4: With improvements that have been made in  
education, I would like to see a college degree  
three years rather than four. (-.520; 2.51,  
.70)
- Item C-58 (Reverse scored): I feel that examinations given  
in school are quite fair. (.449; 2.30, .63)

Variable 38: Preference for laboratory research.

Two items were summed for this variable:

- Item C-67: My preference is for doing actual laboratory  
work rather than studying a text book.  
(-.612; 2.46, .76)
- Item C-27: I feel that my interests lean more toward re-  
search than practical application. (-, .416;  
2.72, .72)

C. Orientation Test Data

Four variables were obtained from orientation test scores.

All new undergraduate students at Michigan State University are  
required to take a number of tests which "are of value in ascertain-  
ing the ability patterns of individual students or groups of students."<sup>12</sup>

Two tests were developed at Michigan State University to

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<sup>12</sup>"The Use of Orientation Test Data," Testing Bulletin No.  
3, East Lansing, Mich.: The Office of Evaluation Services,  
University College, Michigan State University, July, 1960,  
p. 1.

identify students who may require assistance from the Preparatory English Program or the Reading Improvement Series:

The MSU English Placement Test consists of thirty-five objective items representing various aspects of English usage: spelling, capitalization, grammar, punctuation, sentence structure and organization. This test score was used in this study as:

Variable 39: English ability.

The MSU Reading Test is a test of reading comprehension in several different academic areas. "The test is not restricted to the simple mechanics of reading, but rather the score provides some measure of factors involved in critical thought."<sup>13</sup> Data from this test became:

Variable 40: Reading ability.

The College Qualification Tests (CQT) "measure abilities needed for success in higher education."<sup>14</sup> Two tests in the battery were utilized as learner characteristics in this study, "CQT-Verbal"

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<sup>13</sup>Ibid.

<sup>14</sup>"The Psychological Corporation Test Catalogue, 1963. (New York: The Psychological Corporation.) p. 30.

and "CQT-Information".<sup>15</sup>

CQT-Verbal is a timed vocabulary test with synonym-antonym questions. The score on this test provided:

Variable 41: Verbal ability.

The CQT-Information test covers general information in the fields of science (physics, chemistry, biology) and social studies (history, government, economics, geography). It is "designed to be a capsule measure of the student's breadth of background."<sup>16</sup> The CQT-Information test score was used as the measure of:

Variable 42: General information level.

D. MSU-EDP Course Questionnaire

A number of variables were obtained from a questionnaire<sup>17</sup> developed by the Educational Development Program of Michigan State University to compare student attitudes in a research project

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<sup>15</sup>In addition the tests yielded a total aptitude score (CQT-Total) which provided a basis for identifying over and under achievers in the treatment groups.

<sup>16</sup>Ibid.

<sup>17</sup>See Appendix III



utilizing closed-circuit television.<sup>18</sup>

The first 17 items of the questionnaire were designed to answer four questions:

1. Did the student feel the lectures were stimulating?
2. Did the student get his questions answered?
3. Did the student get enough help from his instructors?
4. Could the student see and hear the lectures?<sup>19</sup>

After the questionnaire was administered, responses to the items were factor analyzed. Factor analysis indicated that items related to questions (2) and (3) combined into a single classification, "student interaction with the lecturer." Question (4) appeared to have two components, "perceived ability to see and hear lectures," and "perceived ease of concentrating on the lectures."<sup>20</sup>

The four variables produced by the factor analyzed questionnaire are:

Variable 43: Evaluation of course.

The first variable extracted in the factor analysis (four factor solution) appears to be a general evaluation of the course. Four

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<sup>18</sup>Robert H. Davis and F. Craig Johnson, Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms (East Lansing, Mich.: Educational Development Program, Michigan State University, 1966).

<sup>19</sup>Ibid., p. 7.

<sup>20</sup>Ibid., p. 8.

items had highest loadings on this factor, and the four were summed to represent this variable:

- Item 13: I have often thought about the subject matter of this course outside of the classroom. (.747)<sup>21</sup>
- Item 10: I feel I have learned a great deal in this course. (.717)
- Item 15: As a result of these lectures, I will probably take additional non-required courses in this area. (.663)
- Item 3: This course has been among the most interesting I have taken. (.640)

Variable 44: Perceived ease of interaction with lecturer.

The two items with highest loadings on the item were:

- Item 11: I would have done better in this course if it had been easier to discuss problems with the lecturer. (.749)
- Item 4: I felt the need to ask questions which were not answered in the lecture or discussion part of the course. (.717)

Variable 45: Perceived ability to see and hear lectures.

Two items were used for this variable:

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<sup>21</sup>The factor analysis of the questionnaire was performed by the MSU Educational Development Program. Although mean responses and standard deviations were not obtained from EDP, the magnitude of the loadings and the nature of the items leaves little doubt as to the propriety of summing across the items.

Item 16: I could always hear the lecturer in this course. (.613)

Item 2: I had no difficulty seeing the lecturer or the materials he presented. (.490)

Variable 46: Perceived ease of concentrating on lectures.

Two items were loaded on this factor:

Item 8: Often there wasn't enough going on during the lectures to hold my attention. (.831)

Item 14: I found my attention wandering frequently during lectures. (.796)

Three additional variables were obtained from the MSU-EDP Course Questionnaire. First, two items were added to the questionnaire to assess the students' attitude toward televised instruction:

Variable 47: Attitude toward TV instruction.

Item 23: I intend to take as many TV courses as fit into my schedule.

Item 24: I will recommend TV courses in general to others.

The student was also asked the number of times he attended review sessions:

Variable 48: Number of review sessions attended.

Item 28: I have attended evening review sections: (never; once or twice; on several occasions; many times; always).

Finally, the questionnaire asked the student to forecast his final grade:

Variable 49: Expectation of final grade before final exam.

Item 34: I expect my grade in this course to be:  
(F, D, C, B, A).

E. Records of the MSU Registrar

A final learner variable was obtained from the Registrar's  
Office:

Variable 50: Absences in course.

Also obtained from the Registrar were two alternate means for  
measuring course achievement, the final exam grade and the final  
course grade.

Statistical Analysis of the Data

Each variable in this study was compared with course achieve-  
ment in two ways: (1) by comparing high and low achievers in the two  
viewing groups; and (2) by conventional correlational procedures.

The first analysis, in an effort to hold the effects of academic  
aptitude constant at a low level across all variables, divided the  
students into sub-groups of high and low achievers before examining  
for differences in the treatment groups. The procedure for identify-  
ing high and low achievers was an adaptation of the method developed  
by Farquhar.<sup>22</sup> A scatter diagram was constructed for each viewing

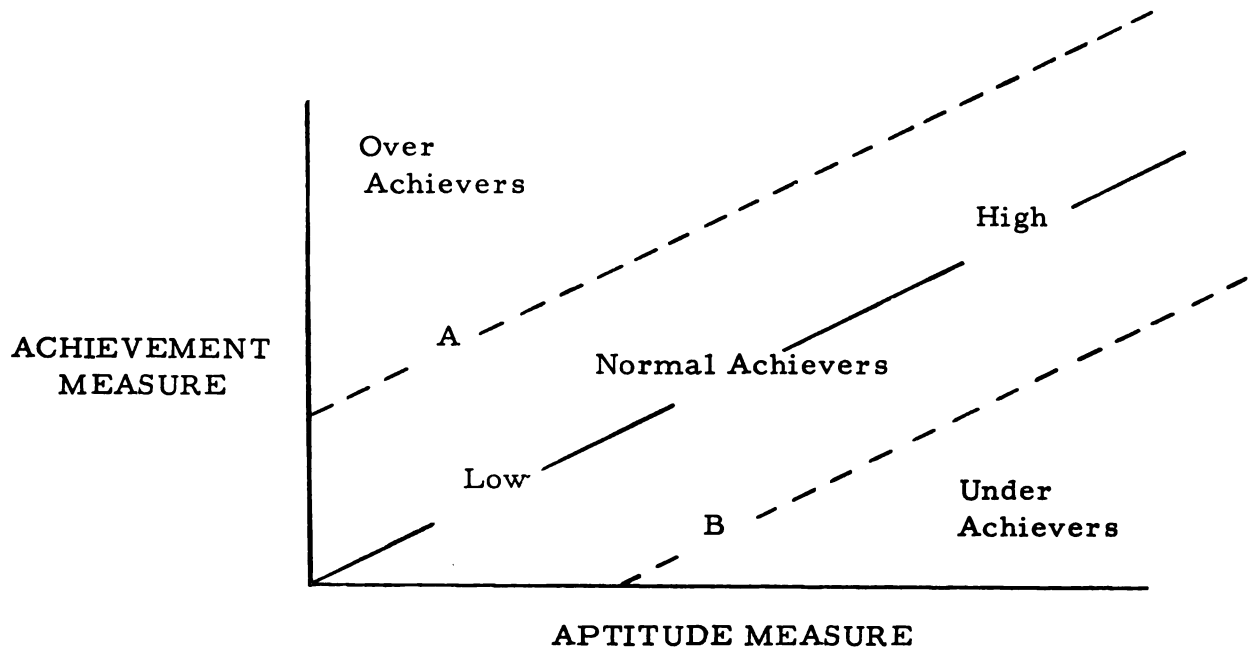
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<sup>22</sup>William W. Farquhar, Motivation Factors Related to Academic  
Achievement (Cooperative Research Project 846) (East Lansing, Mich.:  
College of Education, Michigan State University, January, 1963).

condition, fixing each student according to his aptitude and his course grade. Regression lines were then computed and plotted. These lines provided the expected course grade for any given aptitude score in each treatment group. Lines were then drawn parallel to the regression lines to separate the two groups into high, normal and low achievers, as illustrated by Figure 1. on the following page:

FIGURE 1

EXAMPLE OF USE OF SCATTER DIAGRAM TO DEFINE VARIOUS SUBGROUPS OF ACHIEVERS (from Farquhar)



Farquhar proposes that lines A and B be established by some fraction of the standard error of estimate. In this study the lines were constructed so that three equal groups were produced.

The regression lines were plotted with aptitude (CQT-Total) as the X axis and final course grade as the Y axis, using the following equation from McNemar<sup>23</sup> to compute the regression

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<sup>23</sup>Quinn McNemar, Psychological Statistics (New York: Wiley and Sons, 1962), p. 123.

lines:<sup>24</sup>

$$Y' = r_{xy} \frac{s_y}{s_x} X + (M_y - r_{xy} \frac{s_y}{s_x} M_x)$$

where:

$Y'$  = the predicted Y score

$r_{xy}$  = correlation of X and Y scores

$s_y$  = standard deviation of Y scores

$s_x$  = standard deviation of X scores

$X$  = the given X score

$M_y$  = mean value of Y scores

$M_x$  = mean value of X scores

The Farquhar regression technique for defining over- and under-achievers produced four groups which were compared for each of the 50 variables examined in this study:

1. TV High Achievers	2. Face-to-Face High Achievers
3. TV Low Achievers	4. Face-to-Face Low Achievers

Because the parameters of the population cannot be predicted accurately for most variables utilized in this study,

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<sup>24</sup>The scatter diagrams, plotted regression lines, and lines dividing the TV and face-to-face groups into high, normal and low achievement groups are shown in Appendix IV.

non-parametric tests, the median and Chi square tests, were used to test for significant differences between the sub-groups. As the tests employed are able to compare only two groups at a time,<sup>25</sup> three separate tests for each variable were required: (1) differences in treatment groups for high achievers; (2) differences in treatment groups for low achievers, and (3) differences in high and low achievers.<sup>26</sup> The median test is a procedure for testing ordinal

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<sup>25</sup>Non-parametric tests are available to test any number of subgroups at one time, but these tests do not indicate in what specific ways a group of scores differ, which makes them unsuitable for the purposes of this study.

<sup>26</sup>In actuality, four sub-groups are able to produce nine pairs, all of which could have been tested. For the matrix:

A	B
C	D

the pairs would be: (1) A, B; (2) C, D; (3) A, C; (4) B, D; (5) A, D; (6) B, C; (7) AB, CD; (8) AC, BD; (9) AD, BC. Combinations (1), (2) and (7) were tested. Consideration of the other combinations suggests only one other logical comparison, (8), which tests for differences in the treatment groups disregarding achievement levels. This is essentially the comparison of the treatment groups for comparability which was described at the beginning of this chapter.



data to determine if two independent groups differ in central tendency. "More precisely, the median test will give information as to whether it is likely that two independent groups (not necessarily of the same size) have been drawn from populations with the same median."<sup>27</sup>

The median test requires that the variable being tested be dichotomized at the median for the combined groups. The data are then cast into a 2 x 2 contingency table which is tested by the 2 x 2 Chi square test.

Discrete data, such as sex, were tested by the two-sample or k-sample Chi square tests.<sup>28</sup>

The second procedure which was employed, while simpler to describe, is less defensible than the use of the median and Chi square tests because it is based on the assumption that the parameters of the population are estimable. In this procedure each variable was correlated with achievement (course grades), first for students in the face-to-face group, then for students in the TV group. Pairs of correlations for each variable were then compared, using the z test of significance of the difference between two correlation

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<sup>27</sup>Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill, 1956), p. 111.

<sup>28</sup>Ibid., pp. 104-110 and 175-179.

coefficients described by Edwards.<sup>29</sup>

In both the median (or Chi square) analysis and the correlation analysis, the pattern of differences was analyzed to attempt to discern types of individuals who are affected by the use of TV, and to suggest the relative importance of motivation in the TV and face-to-face sections of ATL 111.

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<sup>29</sup>Allen L. Edwards, Experimental Design in Psychological Research (New York: Holt Rinehart and Winston, 1960), pp. 82-83.

### Summary

This chapter described the treatment groups, the variables, and the statistical tests used in this study.

Learner variables were described according to their sources: (1) MSU Student Inventory (22 variables describing the personal and scholastic background of each student); (2) MSU College Interest Inventory (16 variables describing characteristics of the student's academic attitudes and personality); (3) MSU Orientation Test Data (four variables describing the student's ability in the subject matter; (4) MSU-EDP Course Questionnaire (seven variables describing the student's reactions to aspects of the course); and (5) Records of the Registrar (one variable, course absences, in addition to the achievement measure, course grades).

Two methods of analyzing the data were employed in the study; (1) comparison of high and low achievers in the two viewing groups to determine if these groups differed on the fifty learner characteristics utilized in the study; and (2) correlation of the variables with course achievement in each viewing group, with a comparison of all of the pairs of correlations for each variable.

The way in which these procedures were employed, along with the results of the tests, will be detailed in the next chapter.

## CHAPTER IV

### ANALYSIS OF RESULTS

Following the procedures described in Chapter III, each of the 50 learner variables selected for this study was examined to determine if: (1) the variable was related to the achievement of students enrolled in ATL 111; and (2) if the variable interacted with the teaching methods utilized in the course in influencing student achievement.

#### Findings of the Study

In analyzing the data of this study, continuous learner variables were tested by: (1) the median test (three comparisons; and (2) the difference between two correlations (one comparison), as described in Chapter III. The null hypotheses which were tested for the continuous variables may be stated:

$H_{O_1}$  : For a given variable, the median score for high-achieving TV students will be the same as the median score for high-achieving face-to-face students.

Symbolically:  $H_{O_1} : Md_{HiTV} = Md_{HiFtF}$

$H_{O_2}$  : For a given variable, the median score for low-achieving TV students will be the same as the median score for low-achieving face-to-face students.

Symbolically:  $H_{O_2} : Md_{LoTV} = Md_{LoFtF}$

$H_{O_3}$  : For a given variable, the median score for high achievers (TV and face-to-face groups combined) will be the same as the median score for low achievers.

Symbolically:  $H_{O_3} : Md_{HiAch} = Md_{LoAch}$

$H_{O_4}$  : The correlation between a given learner variable and course grades in the TV group will not differ from the correlation between the variable and course grades in the face-to-face group.

Symbolically:  $r_{TV} = r_{FtF}$

Discrete variables, such as "sex" or questions answerable with a "yes" or "no", were tested by the Chi-square test. In place of the null hypotheses stated above for the median test, the following null hypothesis can be substituted: There is no difference in the two groups being compared in each case in the proportions of students at each value of the variable (symbolically:  $P_{kr} = Q_{kr}$ ).

Dichotomous variables were also tested for differences in their correlations with course grades in the two treatment groups, using point-biserial rather than product-moment correlations. As McNemar points out, for large samples the point-biserial correlation has the properties of the product-moment correlation, but if continuous data are dichotomized, the point-biserial correlation is more conservative in its estimate

of correlation than the product-moment correlation.<sup>1</sup>

The first three tests for the fifty variables examined in this study are summarized in Table 7.

TABLE 7  
COMPARISON OF TV AND FACE-TO-FACE GROUPS,  
ACCORDING TO ACHIEVEMENT LEVELS,  
ON FIFTY LEARNER CHARACTERISTICS,  
FOR A FRESHMAN COURSE IN  
AMERICAN THOUGHT AND  
LANGUAGE, FALL, 1965.

		HiAch		LoAch		Combined Groups	
		TV	FtF	TV	FtF	High Ach	Low Ach
Age	18 or older	44	18	43	17	62	60
	Under 18	13	3	14	3	15	17
Sex	Males	34	11	30	10	45	40
	Females	23	9	27	10	32	37
Nativity of parents	Both Amer. Born	46	17	48	16	63	46
	1/more for. born	11	3	9	4	14	13
Size of home town	City over						
	25,000	30	13	27	12	43	39
	Town under	27	7	30	8	34	38
				25,000			

<sup>1</sup>Quinn McNemar, Psychological Statistics (New York: Wiley and Sons, 1962), pp. 192-93.

TABLE 7. --Continued

		HiAch		LoAch		Combined Groups	
		TV	FtF	TV	FtF	High Ach	Low Ach
Size of gradu- ating class	200 or more	41	11	34	15	52	49
	Under 200	16	9	23	5	25	28
Type of high school	Public	54	17	51	17	71	68
	Non-public	3	3	6	3	6	9
Standing in high school grad. class	Top quarter	48	16	46	16	64	62
	Below top quarter	9	4	11	4	13	15
Participa- tion in H. S. activities	Very active	35**	6	20	6	41	26
	Moderately/ not active	22	14	37	14	36**	51
Church attendance	Frequently	37	11	39	17	48	56
	Rarely or never	20	9	18	3	29	21
Religious preference	Protestant	38	10	35	8	48	43
	Catholic	11	6	15	9	17	24
	Other	8	4	7	3	12	10
Education of father	No college	27	10	23	10	37	33
	Some college	30	10	34	10	40	44
Education of mother	No college	36	11	35	13	47	48
	Some college	21	9	22	7	30	29
Occupation (prestige) of father	Above Md.	27	12	30	9	39	39
	Below Md.	30	8	27	11	38	38
Mother, house- wife or employed	Housewife	39	15	37	15	54	52
	Employed	18	5	20	5	23	25

TABLE 7. --Continued

		HiAch		LoAch		Combined Groups	
		TV	FtF	TV	FtF	High Ach	Low Ach
Years of col- lege desired	4 yrs. or less	25	9	22	11	34	33
	Some graduate	32	11	35	9	43	44
Years of col- lege actually expected	4 yrs. or less	33	13	39	15	46	54
	Some graduate	24	7	18	5	31	23
Plans for out- side job, MSU	Yes	27	10	19	5	37	24
	No	30	10	38	15	40**	53
Source of funds for edu.	Parents	40	12	41	15	52	56
	Other	17	8	16	5	25	21
Expectations re: dating	More in college	20	7	17	8	27	25
	Same/less H. S.	37	13	40	12	50	52
Expec. re: participation in activities	More in college	15	6	17	11	21	28
	Same/less H. S.	42	14	20	9	56	49
Expect. Re: faculty cont.	Less in college	29	11	33	4	40	37
	Same/more H. S.	28	9	24**	16	37	40
Expect. Re: prejudice	Less in college	28	9	24	6	37	30
	Same as H. S. or no opinion	29	11	33	14	40	47
Literary Interest	Above median	15	7	28	8	22	45 <sup>a</sup>
	At or below Md.	52	13	29	12	55**	32
Intellectual aggressiveness	Above median	18	7	17	5	25	22
	At or below Md.	39	13	40	15	52	55



TABLE 7. --Continued

		HiAch		LoAch		Combined Groups High Low Ach Ach	
		TV	FtF	TV	FtF		
Self-concept of intellec- tual ability	At or above Md.	29	10	32	12	30 <sup>**</sup>	44 <sup>a</sup>
	Below median	28	10	25	8	47	33
High grade aspirations	Above median	21	5	18	5	26	23
	At or below Md.	36	15	39	15	51	54
Self- confidence	Above median	19	4	17	4	23	21
	At or below Md.	38	16	40	16	54	56
Interest in the theoret.	Above median	16	6	13	7	22	20
	At or below Md.	41	14	44	13	55	57
Non-utilitar- ian academic goals	At or above Md.	30	11	36	14	25 <sup>**</sup>	50 <sup>a</sup>
	Below median	27	9	21	6	52	27
Attitude to- ward extra- curricular activities	Above median	21	12	25	6	33	31
	At or below Md.	36	8	32	14	44	46
Desire for practical Education	Above median	24	7	16	7	31	23
	At or below Md.	33	13	41	13	46	54
Attitude to- ward the in- tellectual	Above median	16	8	10	7	24	17
	At or below Md.	41	12	47	13	53	60
Preference for library research	At or above Md.	42	10	40	14	52	54
	Below median	15	10	17	6	25	23

TABLE 7. -- Continued

		HiAch				LoAch		Combined Groups	
		TV		FtF		TV		High Ach	Low Ach
Attitude to- ward school life	Above median	26	9	28	12	35	40		
	At or below Md.	31	11	29	8	42	37		
Attitude to- ward out-of- class study	Above median	25	10	27	11	35	38		
	At or below Md.	32	10	30	9	42	39		
Desire for solitude	Above median	10	4	15	6	14	21		
	At or below Md.	47	16	42	14	63	56		
Academic anxiety	Above median	19	6	20	12	25	32		
	At or below Md.	38	14	37	8	52	45		
Preference for lab research	At or above Md.	33	8	31	8	41	39		
	Below median	24	12	26	12	36	38		
English ability	Above median	25	11	25	8	39	33 <sup>a</sup>		
	At or below Md.	32	9	32	12	38	44		
Reading ability	Above median	29	8	29	8	45	32 <sup>a</sup>		
	At or below Md.	28	12	28	12	32 <sup>**</sup>	45		
Verbal ability	Above median	27	10	27	11	37	38		
	At or below Md.	30	10	30	9	40	39		
General Infor- mation level	Above median	24	8	39 <sup>**</sup>	7	33	46 <sup>a</sup>		
	At or below Md.	33	12	18	13	44 <sup>**</sup>	31		
Evaluation of courses	Above median	29	7	22	7	25	29 <sup>a</sup>		
	At or below Md.	28	13	35	13	52	48		

TABLE 7. --Continued

		HiAch		LoAch		Combined Groups	
		TV	FtF	TV	FtF	High Ach	Low Ach
Perceived ease of in- teraction with lecturer	Above median	29	9	24	11	38	35
	At or below Md.	29	11	33	9	39	42
Perceived ability to see and hear lectures	Above Median	20	4	22	3	24	25
	At or below Md.	37	16	35	17	53	52
Perceived ease of con- centrating on lectures	Above median	24	9	18	8	33	26
	At or below Md.	33	11	39	12	44	51
Attitude to- ward TV instruction	Above median	26	12	16	9	53**	25 <sup>a</sup>
	At or below Md.	31	8	41	11	24	52
Attendance at review sessions	None	56	17	53	19	73	72
	One or more	1	3	4	1	4	5
Expected final grade before final	A or B	40	10	11	2	50**	13
	C or below	17	10	46	18	27	64
Absences in course	None	12	11	29	4	43	33
	One or more	25	9	28	16	34	44
Total in each group		57	20	57	20	77	77

\*\*Significant at .05 level.

NOTE: <sup>a</sup>The combined matrix is not necessarily the sum of the high and low achievement matrices because the groups can have different medians.

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The fourth hypothesis for each variable compared the correlations between the variable and achievement in the two viewing conditions. The z test of significance of the difference between two correlation coefficients<sup>2</sup> was used to test the hypothesis that the two correlations for a given variable differed beyond chance occurrence. The results of the fifty tests are summarized in Table 8 on the following page:<sup>3</sup>

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<sup>2</sup>Allen L. Edwards, Experimental Design in Psychological Research (New York: Holt, Rinehart and Winston, 1960), pp. 82-83.

<sup>3</sup>Inter-correlations for all but six of these variables (which required special manipulation) are found in Appendix V.

TABLE 8

COMPARISON OF CORRELATIONS BETWEEN EACH OF  
50 LEARNER VARIABLES AND ACHIEVEMENT  
(COURSE GRADES) IN TV AND FACE-TO-FACE  
GROUPS OF A FRESHMAN COURSE IN  
AMERICAN THOUGHT AND  
LANGUAGE, FALL, 1965.

	Correla- tion with final grade, TV group	Correla- tion with final grade, Face-to- Face group	Differ- ence <sup>a</sup>	Signifi- cance of differ- ence <sup>b</sup>
Age	-.004	-.200	.199	NSD
Sex	-.110	-.127	.017	NSD
Nativity of parents	.094	.079	.015	NSD
Size of home town	-.033	.058	-.091	NSD
Size of gradu- ating class	-.001	-.125	.124	NSD
Type of high school	-.069	-.019	-.050	NSD
Standing in H.S. gradu- ating class	-.206*	-.372*	.181	NSD
Participation in high school activities	-.153	-.091	-.062	NSD

TABLE 8. --Continued

	Correla- tion with final grade, TV group	Correla- tion with final grade, face-to- face group	Differ- ence <sup>a</sup>	Signifi- cance of differ- ence <sup>b</sup>
Church attendance	.018	-.098	.116	NSD
Religious preference (Xtian/non- Xtian)	.228	-.063	.169	NSD
Education of father	.084	.163	-.079	NSD
Education of mother	.118	.096	.023	NSD
Occupation of father	-.066	.038	-.104	NSD
Mother, house- wife, or employed	.036	-.110	.146	NSD
Years of col- lege desired	.127	.373*	-.263	NSD
Years of col- lege actually expected	.192*	.256*	-.069	NSD
Plans for out- side job at MSU	-.142	-.155	-.013	NSD
Source of funds for education	-.007	.130	-.138	NSD

TABLE 8. -- Continued

	Correla- tion with final grade, TV group	Correla- tion with final grade, face-to- face group	Differ- ence <sup>a</sup>	Signifi- cance of differ- ence <sup>b</sup>
Expectations regarding dating	-.045	.105	-.150	NSD
Expectations re: participa- tion in acti- vities	-.026	.188	-.216	NSD
Expectations re: faculty contact	-.095	.211	-.309	Sig.
Expectations re: prejudice	.008	.253	-.254	NSD
Literary interest	-.142	-.304*	.171	NSD
Intellectual aggressiveness	-.067	-.069	-.002	NSD
Self-concept of intellectual ability	-.143	-.219	-.079	NSD
High grade aspirations	.073	.193	-.122	NSD
Self-confidence	.073	.039	.034	NSD
Interest in the theoretical	.142	.096	.047	NSD

TABLE 8. --Continued

	Correla- tion with final grade, TV group	Correla- tion with final grade, face-to- face group	Differ- ence <sup>a</sup>	Signifi- cance of differ- ence <sup>b</sup>
Non-utilitarian academic goals	.253*	.211	.044	NSD
Attitude toward extra-curricular activities	-.030	.382*	-.432*	Sig.
Desire for practical edu- cation	.205*	.324*	-.129	NSD
Attitude toward the intellectual	.184	.037	.149	NSD
Preference for library research	-.010	-.389*	.401	Sig.
Attitude to- ward school life	-.036	-.285*	.257	NSD
Attitude to- ward out-of- class study	.047	.024	.023	NSD
Desire for solitude	-.086	-.079	-.007	NSD
Academic anxiety	-.095	-.201	.107	NSD
Preference for lab research	-.090	-.160	.071	NSD



TABLE 8. --Continued

	Correla- tion with final grade, TV group	Correla- tion with final grade, face-to- face group	Differ- ence <sup>a</sup>	Signifi- cance of differ- ence <sup>b</sup>
English ability	.393*	.413*	-.024	NSD
Reading ability	.533*	.575*	-.062	NSD
Verbal ability	.367*	.452*	-.103	NSD
General infor- mation level	.381*	.586*	-.270	NSD
Evaluation of course	-.056	-.215	.162	NSD
Perceived ease of interaction with lecturer	.213*	.010	.206	NSD
Perceived abil- ity to see and hear lectures	-.012	-.046	.034	NSD
Perceived ease of concentrat- ing on lectures	.140	.265*	-.136	NSD
Attitude to- ward TV instruction	.027	.084	-.057	NSD
Attendance at review ses- sions	-.007	.060	-.067	NSD

TABLE 8. --Continued

	Correla- tion with final grade -TV group	Correla- tion with final grade - face-to- face group	Differ- ence <sup>a</sup>	Signifi- cance of differ- ence <sup>b</sup>
Expected final grade before final	.412*	.273*	.158	NSD
Absences in course	-.186*	-.179	-.007	NSD

\*Significant at .05 level, two-tailed test.

Critical level for TV group (N = 172) = .151

Critical level for face-to-face group (N = 60) = .255

NOTES: <sup>a</sup>Difference scores may not be exactly the difference of the listed correlations since correlations were normalized before subtraction was performed (see Edwards, op. cit., pp. 81-82).

<sup>b</sup>Significance of difference according to the formula:

$$(z'_1 - z'_2) = 1.96 \frac{1}{N_1 - 3} - \frac{1}{N_2 - 3} \text{ (from Edwards,}$$

op. cit., pp. 82-83).

where  $(z'_1 - z'_2)$  = difference in normalized correlations needed to reject null.

$N_1$  &  $N_2$  = size of groups.

For this study: critical  $(z'_1 - z'_2) = .30$

Discussion of the Findings

Comparison of high and low achievement in the treatment groups.

The comparison of high and low achievement with the method of instruction across the fifty variables is summarized in Table 9.

TABLE 9.

DISTINGUISHING CHARACTERISTICS OF HIGH AND  
LOW-ACHIEVING ATL 111 STUDENTS IN TV  
AND FACE-TO-FACE SECTIONS  
ACCORDING TO OBTAINED  
DIFFERENCES.

	<u>TV</u>	<u>Face-to-Face</u>
High Achiever	Expected a high grade. Participated in H. S. activities. Plans to get a job while in college. Likes literature. Thinks he can do better than he is doing. Reads well. Likes TV instruction.	Expected a high grade. Did not participate in H. S. activities. Plans to get a job while in college. Likes literature. Thinks he can do better than he is doing. Likes TV instruction. Has a high information level.
Low Achiever	Did not expect a high grade. Did not expect much faculty contact in college. Does not like literature. Has a relative high information level. Does not like TV instruction.	Did not expect a high grade. Participated in H. S. activities Expected contact with faculty. Has a low information level. Does not like TV instruction.

The results as summarized by Tables 7 and 9 are disappointing for two reasons. First, the data give us little information. Only three comparisons differentiated according to the viewing condition: (1) "Participation in high school activities" discriminated the viewing groups for high achievers; (2) "General information level" discriminated for low achievers, and (3) Low achievers differed in their "Expectations regarding faculty contact."

Furthermore, the differences which were obtained must be regarded with suspicion. A total of 150 comparisons are summarized in Tables 7 and 9, twelve of which are significant at the .05 level. But in 150 tests, five percent of them, eight in this case, could be significant by chance occurrence.

Comparison of correlations with achievement in the treatment groups.

The comparison of the correlations of each variable with course grades in the two viewing groups provides little additional information. Three pairs of correlations differed significantly: (1) Expectation regarding faculty contact; (2) Attitude toward extra-curricular activities; and (3) Preference for library research. In each of these pairs the variable correlates as one might expect in the face-to-face group, while little relationship exists in the

TV group.

The three significant pairs are not unique in having a higher correlation in the face-to-face group than in the TV group. Inspection of Table 8 reveals that 35 of the 50 pairs yielded higher correlations in the face-to-face group. If for each pair there had been a 50-50 chance of one or the other correlation being greater, the probability that 35 pairs would be in the same direction is less than .002.<sup>4</sup>

The next chapter will further discuss the findings of the study.

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<sup>4</sup>Tested by the sign test (Siegel, pp. 68-75). It should be noted that the actual probability of obtaining the results are not calculable since the 50 pairs do not represent independent observations.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

This study investigated the relationship of academic motivation to the use of television to present course lectures in a freshman course at Michigan State University. Specifically, the study: (1) compared the characteristics of high and low achievers in TV sections of a course in American Thought and Language with the characteristics of high and low achievers in sections of the course in which lectures were received face-to-face with the lecturer in a large lecture hall; and (2) compared the relationship of selected learner characteristics to course achievement in the two viewing conditions.

Fifty learner characteristics, selected to represent the social-personal and educational backgrounds of the students, academic attitudes, and reactions to the lectures in the course, were compared across the achievement groups, using the median and Chi square tests of significance. Additionally, each learner variable was correlated with the measure of course achievement (course grades) in each of the viewing conditions (TV and face-to-face) to determine which variables interacted with the methods used to present course lectures.

No comparison produced results much above those which could be expected by chance. High achievers in the TV group were more

apt to have participated in high school activities than high achievers in the face-to-face group. Low-achieving TV students expected less faculty contact and had higher information levels on entering college than low-achieving face-to-face students.

Correlating the learner variables with course grades in the two viewing conditions produced three pairs of correlations in which the correlation was significantly greater in the face-to-face group than in the TV group: (1) "Expectation regarding faculty contact"; (2) "Attitude toward extra-curricular activities"; and (3) "Preference for library research."

In general the learner variables tended to correlate higher in the face-to-face group than in the TV groups, suggesting that grades of students in face-to-face sections of the course tend to be more influenced by internal motivational factors than students in TV sections.

### Conclusions

Although the data provide little help in determining how individual learner variables interact with the use of television in higher education, the results of this study do appear to confirm the idea that motivation, intelligence and characteristics of the learning situation, in combinations, are the determinants of

course achievement.

The contribution of intelligence is clear. About one-fourth of the variability in course grades in this study is attributable to academic ability, a figure comparable to those found in similar studies.

That motivation and instructional method help determine course grades is suggested not only by the few differences which were obtained, but also by the much larger proportion of higher learner-variable and achievement correlations in the face-to-face group compared to the TV group.

Before going further it should be noted that the data of this study do not suggest that students in either group were more motivated to achieve academically than students in the other group. The groups were essentially the same at the beginning of the course, and achievement at the end of the course did not differ in the two groups;<sup>1</sup> this would suggest motivation to achieve academically was equal in the two groups throughout the course.

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<sup>1</sup>Robert H. Davis and F. Craig Johnson, Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms (East Lansing, Mich.: Educational Development Program, Michigan State University, 1966), p. 10.



The data do seem to suggest, at the broadest level of concern, that final course grades tend to be more influenced by non-intellectual motivational factors when a student is face-to-face with the lecturer than when he views the same lecturer by television. There seems to be an equalization process at work in the TV sections, making achievement in them less dependent on the non-intellectual individual differences of students.

✓ A basic, intuitive explanation for this conclusion is that students viewing lectures by television perhaps are somewhat blasé about the teaching method. They accept it and learn from it, but are not particularly stimulated by it. The more highly motivated students may be somewhat frustrated by the lack of contact with the lecturer and perhaps they perform less well than if they had been in the lecture hall. The less motivated students seem to find it a convenient and painless way to view lectures, and probably are less easily distracted than in a lecture hall. They may thus tend to perform better than they would have in the lecture rooms.

It may also be that less motivated students in general tend not to have the "dependency needs" of highly motivated students. According to Professor Beck of Portland State College, there is evidence that some students have strong dependency needs which

television teaching does not satisfy.<sup>2</sup> When this need is not satisfied, otherwise high-achieving, highly motivated students may become more similar to normal and "under achievers".

Whatever the reason, inspection of the data does lead one to believe that a generalized internal motivational drive has interacted with the use of television. For example, although only three differences in correlations between the variables and achievement in the two viewing conditions were significant, inspection of the top dozen differences, as a group, produces plausible typologies of high- and low-achieving students. Ranked, beginning with the correlations which differed the most, the data indicate students in face-to-face section of the course tend to do well if they:

1. Believe academic activities are more important than extra-curricular activities,
2. Like library research,
3. Expect less faculty contact in college than in high school,
4. Have a high general information level,
5. Desire more college than the average student,

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<sup>2</sup>Quoted in Marvin Laser, Television for the California State Colleges (Los Angeles: Chancellor of the California State Colleges, 1962), p. 31.

6. Like school life,
7. Expect less prejudice in college than in high school,
8. Expect to participate in activities less in college than in high school,
10. Are older,
11. Were high in their high school graduating class,
12. Have a high literary interest.

Those who did poorly in the face-to-face sections tended to exhibit the converse of these characteristics.

The above characteristics describe, for face-to-face classes, recognizable types of students who often do well or poorly in a college course. But no recognizable descriptions of the low- and high-achieving TV students are detectable in the data. Of the dozen greatest correlational differences, only the ninth favored the TV group: "Perceived ease of interaction with lecturer." That is, for these groups it only mattered slightly for the better student in the face-to-face group whether or not he felt it difficult to interact with the lecturer, while the better student in the TV sections more consistently felt it was difficult to interact with the lecturer. The majority of the other TV correlations in the above pairs were close to zero, suggesting that "good" and "bad" students in TV sections are affected less by the personal factors

that typically determine academic motivation.

Further inspection of these twelve pairs of correlations reveals that the pre-existing learner variables which did correlate with achievement in the TV group (even while correlating higher in the face-to-face group) to be those variables which also correlated with intellectual ability. Thus it appears that bright students in both viewing conditions tended to do well in the course, but non-intellectual variables influenced grades more in the face-to-face group than in the TV groups.

Unfortunately, the direct comparison of high and low achievers in the two viewing conditions neither supports nor contradicts this contention. An insufficient number of significant differences was obtained to meaningfully or sufficiently describe high and low achievers in the two viewing conditions.

### Implications of the Study

In Chapter I it was proposed that achievement in a particular college course is a function of: (1) past experience, which produces (2) internal motivational forces, developing within an individual over time, which combine with (3) external motivational factors, which in turn interact with (4) native ability. Although the data of this study suggest this paradigm is a useful way of

conceptualizing the relationship of motivation to college course achievement, the speculations in the last section suggest that the paradigm might be improved if it considered three rather than two types of motivation--internal and external. It appears that a learner's present perceptions of the learning circumstances produce an internal state which can strongly influence achievement. This would suggest that the paradigm might better be stated:

Given a learning situation with appropriate stimuli, a learner's past experience ( $E_{pa}$ ), in continual interaction with developed internal motivational forces ( $M_{in}$ ), sums with transitory internal motivational states ( $M_t$ ) which interact with present experiences outside the given learning situation ( $E_{pr}$ ), to add with external motivational forces ( $M_{ex}$ ) in interaction with native ability (IQ) to produce achievement (A).

Symbolically the revised paradigm then becomes:

$$(M_{in} \longleftrightarrow E_{pa}) + (M_t \longleftrightarrow E_{pr}) + (M_{ex} \longleftrightarrow IQ) \rightarrow A.$$

The need for paradigms which help maintain broader perspectives of the learning process than we have maintained in past decades is increasing as we move deeper into the technological age. As the contemporary philosopher Marshall McLuhan points out, there is growing need to involve the student with learning stimuli in a total, global way, stressing pattern recognition rather than the acquisition of specific information.<sup>3</sup> To learn how to do this

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<sup>3</sup>Marshall McLuhan, Understanding Media: The Extensions of Man (New York: McGraw-Hill, 1965), pp. ix, 19, 60, 311, 342.

requires an understanding of the relationship of motivation, or at least components of it, to the use of media in instruction.

Motivation has been largely ignored in media research because available theory and research on audio-visual materials and methods "overemphasize the potency of immediate stimulation and underemphasize the importance of motivational processes which are intra-organismic and which operate in the life history of individual learners."<sup>4</sup> That is, we have concerned ourselves too much with what is acting on the learner, rather than what is happening within the learner.

This in turn is primarily because most learning research has followed mechanistic models which tend to ignore intervening "organism" variables. As Postman states:

The major body of experimental research on human learning and memory has been carried on within a theoretical framework which can be described as "associationistic functionalism". That is, the basic experimental procedures and methods of analysis reflect an associationistic conception of the learning process. The wide reliance on such techniques as serial and paired-associate learning with verbal materials is a case in point.<sup>5</sup>

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<sup>4</sup>C. Ray Carpenter, "Psychological Concepts and Audio-Visual Instruction," Audio-Visual Communications Review, V: 1361, 1957.

<sup>5</sup>Leo Postman, "Human Learning and Audiovisual Education," in Learning Theory and AV Utilization, Audio Visual Communication Review, Vol. 9, No. 5, Sept.-Oct., 1961, p. 69.

The data suggest a need to focus more attention on all sorts of learner characteristics, individually and collectively, perhaps turning to the less mechanistic neo-Gestalt psychologies for new models to describe educational media effects. For example, earlier it was concluded that the data of this study suggest that TV students are less effected by non-intellectual factors than face-to-face students. It may be, in Gestalt phraseology, that students in the TV sections of ATL 111 have more similar psychological "fields," and ones less dependent on the backgrounds of the learners, than students in the face-to-face sections. According to Bigge, a cognitive-field Gestalt psychologist, a learner's field "consists of the concurrent interrelationships in any one situation:"

To a psychologist "field" means the total psychological world in which a person lives at a certain time. It includes matters past, present and future, concrete and abstract, actual and imaginary--all interpreted as simultaneous aspects of a situation.<sup>6</sup>

The homogenizing influence of TV probably is exerted both in the TV classroom, where all students see lectures from essentially the same point of view (that of the camera), and in a more diffuse way outside of the classroom as students prepare

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<sup>6</sup> Morris L. Bigge, Learning Theories for Teachers (New York: Harper and Row, 1964), p. 177.

assignments for the course, study for tests, or simply discuss the course with peers. Yet in either case we can describe the influence of TV terms of psychological fields:

A psychological field or life space is a construct of such nature that it contains everything psychological which is taking place in relation to a specific person at a given time. The unit of time, microscopically viewed, is a moment; however, macroscopically considered, it may cover hours or even weeks. Whatever the length of time, everything is going on at once--that is the meaning of "field."<sup>7</sup>

The fields of learners may be more similar in the TV sections than in face-to-face sections because the impersonality of the TV set inhibits directly and/or indirectly the academic achievement drive of the highly motivated student, making his life space more similar to that of students with average achievement drive.

#### Practical Implications of the Study

Although the results of this study are not conclusive, the data suggest that achievement may be more a function of academic motivation in face-to-face lecture classes than in TV lecture classes. It appears that some students who tend to be a high achiever may have needs which make it desirable to have them face-to-face with the lecturer. But since academic motivation, as

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<sup>7</sup>Ibid., p. 190.



represented by the variables selected for this study, appears to be unrelated to achievement in TV lectures, students relatively low in academic motivation may actually profit by being "psychologically distant" from the lecturer (see Chapter I, pp. 19-20). Thus face-to-face instruction may be better for the student with high motivation to achieve academically, but TV may be better for students with low motivation to achieve.

The above contention needs to be tested with further research, using other measures of motivation such as Farquhar's M-Scales.<sup>8</sup> It seems reasonable, nevertheless, to suggest that if a course offers both face-to-face lecture sections and dormitory TV sections, students should be given the opportunity to select the teaching methods they prefer. Students at the University of Illinois have been given a free choice of viewing areas, including dormitory lounges, in some TV courses.<sup>9</sup> This might be tried at Michigan State University.

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<sup>8</sup>William W. Farquhar (Project Director), Motivation Factors Related to Academic Achievement. Cooperative Research Project 846. (East Lansing, Mich.: Michigan State University, January, 1963.)

<sup>9</sup>John W. Meany, Televised College Courses (New York: The Fund for the Advancement of Education, 1962), pp. 29-30.

The data of this study also suggest that ways should be found to appeal to the needs of highly motivated students who find themselves in a TV course. Perhaps these students might be encouraged more by recitation instructors to visit the TV lecturer during his office hours.<sup>10</sup> Or provisions might be made to discuss material with the course lecturer in weekly review sessions. Chicago City Junior College, in experimenting with broadcasting college courses to housewives and others who can not easily attend college, devised a number of ways for appealing to the high motivation of its students:

1. Learning materials designed for maximum interaction between student and instructor, and student and material, were sent to the students.
2. Face-to-face conferences were scheduled throughout the course.

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<sup>10</sup>While gathering data for this study, the researcher assisted Davis and Johnson (op. cit.) by interviewing students viewing course lectures by television. One student mentioned early in the interview that in the beginning he had not liked being in the TV class, but had changed his mind completely after a time. Later in the interview he mentioned that he enjoyed his weekly meetings with the lecturer! He had gone to the lecturer's office early in the term with a question, and thereafter visited him each week. His perceptions of the course and CCTV were obviously changed by this personal contact with the lecturer.

3. Telephone conference hours were established for the television instructor. These times were to be used only for discussing points brought out in lecture; separate telephone hours were established with an assistant instructor for answering administrative questions.<sup>11</sup>

#### Recommendations for Further Study

It is recommended that the relationships between non-intellectual learner variables and achievement in TV courses be further investigated. Specifically, it is recommended that this study be replicated with more precise means for measuring the variables; with better controls, especially for intelligence; with a priori groupings of variables, perhaps according to analytic techniques such as facet analysis; and with alternate means for measuring academic motivation, such as with the Michigan M-Scales.

It is also recommended that as a part of this replication, or as a separate study, the paradigm developed for this study be tested in some way, perhaps with facet or factor analysis.

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<sup>11</sup> Clifford G. Erickson and Hymen M. Chausow, Chicago's TV College: Final Report of a Three Year Experiment. (Chicago: Chicago Public Schools, 1960), pp. 5-6, 30-32.

Research is also needed which will suggest ways television can provide maximum external motivation for different levels or types of internal motivation. A beginning in this area has been made by Edling who conducted an experiment "to determine whether or not communications containing an instructional message designed to modify attitudes for a group of students with a specific motivational pattern have significantly greater impact on individuals whose motivational pattern is congruous with the message, than on others who do not possess the motivational pattern provided for in the communication."<sup>12</sup> He found that a message for the mass media specifically designed for particular motivational patterns was more effective with those for whom it was designed than for the total audience, concluding "that techniques employed by the behavioral scientists can make a significant contribution to the development of more effective instructional materials at two points. First, in the analysis of characteristics of learners to assist in instructing the content of materials, and second, in empirically testing

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<sup>12</sup> Jack V. Edling, A Study of the Effectiveness of Audio-Visual Teaching Materials When Prepared According to the Principles of Motivational Research (Monmouth, Oregon: Oregon State System of Higher Education, 1963), p. 117.

materials to determine their psychological validity."<sup>13</sup> Edling used affective (persuasive) communications; the findings of the present study would suggest that learning materials designed specifically for high and low motivational levels should be more effective cognitively as well as affectively. The Edling experiment should be replicated to determine if this conclusion is tenable.

The above suggests that a very practical area of investigation is the determination of the additional kinds of data which an institution should develop for its students in order to understand and provide for some of the more powerful influences on student achievement.

Finally, study is needed to determine the best combinations of teaching methods for different types of learners, and the best approach for the methods which are employed. For example, the results of this study might have been different had the lecturer distributed an outline of each lecture at its conclusion, or if he had taken a more dynamic approach to the delivery of his material. And research is needed which treats differences in presentational techniques in the large lecture hall and on television as independent variables. Wallen and Travers believe college students are more

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<sup>13</sup>Ibid., p. ix (abstract).

affected by instructional decisions such as these than students in lower grades:

The trend in theory of motivation is to suggest that, as the individual grows older, arousal can be triggered by more and more specific and identifiable classes of stimuli. For example, suppose a person is said to manifest a high level of achievement need. The implication would be that his arousal system is activated by situations in which he has an opportunity to excel. If the function of the teacher is to raise the level of arousal of the pupil to an optimum level, then he must be able to introduce into the environment those stimuli which will have arousal value for particular pupils.<sup>14</sup>

The authors conclude that there is great need for attempts to design teaching methods which make use of a wide range of learning principles:

"There is a possibility that many different teaching methods might be designed which would make full use of many principles, differences between them being a product of the objectives that each is designed to achieve."<sup>15</sup>

Carpenter states essentially the same idea:

Common and defined objectives and standards of learning may be achieved by many different approaches, by different materials and methods, at different rates and at different stages of the development of individuals."<sup>16</sup>

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<sup>14</sup>Norman E. Wallen and Robert M. W. Travers, "Analysis and Investigation of Teaching Methods" in Handbook of Research on Teaching, N. L. Gage, ed. (Chicago: Rand McNally, 1963), p. 492.

<sup>15</sup>Ibid., pp. 500-501.

<sup>16</sup>Carpenter, op. cit., p. 366.

Unfortunately, as Carpenter quickly adds, "in this complex area, as yet, reaching decisions as to how and when to use different audio-visual materials and methods is perhaps more of an art than a science."<sup>17</sup>

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<sup>17</sup>Ibid.

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## APPENDIX I

MICHIGAN STATE UNIVERSITY

Student Inventory

This year a study will be made of college freshmen: their attitudes and views toward a variety of topics, their behavior, and their background. In order that the research staff learn more about the nature of the student population, we would appreciate receiving certain information from you. It will be appreciated if you will be as accurate as possible in providing this information. While it is necessary to ask your name, your replies will be held in strict confidence and will be read only by the research staff.

Do not begin working until you have read, understood, and carried out the directions below.

1. On the answer sheet, print in the appropriate places, your name (LAST NAME FIRST), date, student number and name of test (SI).
2. Unless your STUDENT NUMBER IS CORRECTLY MARKED in pencil in the six rows of spaces under the words STUDENT NUMBER, your answer sheet CANNOT BE PROCESSED. First, WRITE your student number in the vertical column of blank boxes under the heavy arrow. Then MARK ONE SPACE in EACH of the SIX ROWS of ten spaces that corresponds to each number of your student number. Be sure that (a) you have ONE MARK in each of the six rows, (b) that there is ONLY ONE MARK in a given row, (c) that you CHECK EACH SPACE you marked again to make sure that you have indicated your correct student number. (The example below for John N. Doe is marked correctly for student number 917604.)

MICHIGAN STATE UNIVERSITY

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3. Record all your answers on the answer sheet with your special pencil. Make no marks on this booklet.

Remember, this is not a test -- there are no right or wrong answers. Please be frank and sincere in your responses. For each part of the test, pay particular attention to the directions given. Make sure that you record your responses in the appropriate spaces on the answer sheet.

**PART I**

1. Sex:                      1. Male                      2. Female

2. Age at last birthday:
  1. Under 18                      2. 18
  3. 19                              4. 20 or over

3. Marital status:
  1. Single                              2. Married
  3. Divorced                              4. Widowed

4. How often do you attend the church of your faith?
  1. Regularly                              2. Frequently
  3. Rarely                                      4. Never

5. Nativity of parents:
  1. Mother native-born and father foreign-born
  2. Father native-born and mother foreign-born
  3. Both foreign-born
  4. Both native-born

6. As you see your situation at the present time, how much education would you like to have?
  1. A year of college
  2. Two years of college
  3. Three years of college
  4. Four years of college (Bachelor's Degree)
  5. Graduate or professional school

7. As you see your situation at the present time, how much education do you really expect to get?

1. A year of college
2. Two years of college
3. Three years of college
4. Four years of college (Bachelor's Degree)
5. Graduate or professional school

8. Before coming to college, in what kind of a community did you live most of your life?

1. Farm
2. Village, 250-2499 population
3. Town, 2500- 24,999 population
4. City, 25,000-99,999 population
5. City, over 100,000 population

9. Type of secondary school attended (for most of your high school years):

1. Public
2. Parochial
3. Private (non-parochial)

10. Size of high school graduating class:

1. Under 25
2. 25-99
3. 100-199
4. 200-399
5. 400-999
6. Over 1000

CONTINUED ON REVERSE SIDE

11. In which quarter of your high school graduation class did you stand with respect to grades?

1. Top quarter
2. Second quarter
3. Third quarter
4. Bottom quarter

12. How actively did you participate in high school activities?

1. Very active
2. Moderately active
3. Not active

13. About how far did your father go in school? Blacken only one of the following spaces:

1. Attended grade school (grades 1 to 8) but did not finish
2. Completed grade school through grade 8
3. Attended high school (grades 9 to 12) but did not graduate
4. Graduated from high school
5. Technical or business school
6. Attended college but did not graduate
7. Graduated from college
8. Attended graduate school or professional school but did not attain a graduate or professional degree
9. Attained a graduate or professional degree

14. About how far did your mother go in school? (Follow same directions as for Question 13.)

15. What is your principal source of support while at college?

1. Parents
2. Job
3. Loans
4. Scholarship
5. Personal savings

16. Where will you live while attending M.S.U.?

1. Dormitory
2. Off-campus apartment
3. Off-campus rooming house
4. Fraternity or sorority house
5. With my family

17. Do you now have, or plan to get, a job during the academic year?

1. Yes
2. No

18. Religious preference:

1. Catholic
2. Jewish
3. Protestant
4. None
5. Other

IF PROTESTANT (answer item 19)

19. Denomination:

1. Assembly of God
2. Baptist
3. Church of Christ
4. Congregational
5. Dutch Reformed
6. Episcopal
7. Lutheran
8. Methodist
9. Presbyterian
10. Other

\* \* \* \* \*

Items 20-21: Parental Occupation

Using the code below, designate your father's and mother's occupation.

1. Manual worker - no special training required
2. Skilled labor
3. Business owner
4. Farm owner or operator
5. Executive or managerial
6. Office, clerical and sales
7. Teacher (elementary or secondary)
8. Professional
9. Service (store clerk, barber)
10. Homemaker

20. Father's primary occupation

21. Mother's primary occupation

\* \* \* \* \*

PART II: Selecting a College

Items 22-30: Selecting a college is one of the most important decisions a student has to make. Frequently, students consult with other people regarding their choice of a college.

In items 22-29, indicate those with whom you actually discussed the selection of a college according to the following code:

1. Yes
2. No

22. Parents (1)

23. Friends in high school (2)

24. Friends attending college (3)

25. High school teacher (4)

26. Athletic coach (5)

27. Guidance counsellor (6)

28. Minister, priest, or rabbi (7)

29. College representative (8)

- - - - -

30. Which ONE of these do you feel played the most important role in helping you decide to attend M.S.U.? (Mark your answer by using one of the numbers, 1-8, in the list above.)

\* \* \* \* \*

PART III: College Impressions

Compare your senior year in high school to how you think your first year in college will be according to the following key:

- KEY: 1. More in college  
2. Same as high school  
3. Less in college  
4. No opinion

31. Homework and studies

32. School activities

33. Dating

34. Contact with faculty

35. Prejudice because of social and/or religious issues

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## APPENDIX II

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PART 1. ACADEMIC INTERESTS

The statements that follow represent activities in which you might engage as a college student. Indicate your interest for each activity by using the following key for marking your responses for questions A1-A130 and B1-B78.  
(Use answer sheet A for items A1-A130, and answer sheet B for B1-B78.)

- KEY: 1. Definitely like  
2. Like  
3. Dislike  
4. Definitely dislike

Respond to every item even though it is difficult to decide.

Put aside answer sheet A and mark your responses to items B1-B130 in the appropriate spaces on answer sheet B. (Continue to use the same Key until instructed otherwise.)

- |   |  |
|---|--|
| D 1. Study the functioning of the sense organs                                | B 21. Take a course in operating printing machinery and equipment  |
| B 2. Study housing conditions as they affect health and social life           | B 22. Observe under a microscope the structure of protozoans   |
| B 3. Take a course in modern painting   | B 23. Read a newspaper column on world problems  |
| B 4. Investigate the chemical process in the production of cheese             | B 24. Study the history of art   |
| B 5. Study principles of design of women's clothes                            | B 25. Read about improved methods of raising cattle  |
| B 6. Study the stock exchange, speculation and investment                     | B 26. Read about work conditions for factory workers   |
| B 7. Take music lessons   | B 27. Listen to a symphony orchestra on the radio  |
| B 8. Learn about the migration of fish populations                            | B 28. Learn the techniques for making plywood  |
| B 9. Find out about mortgages, stocks and bonds                               | B 29. Study real estate financing and investment   |
| B 10. Study the atomic and molecular theories                                 | B 30. Study the physical behavior of the earth's atmosphere  |
| B 11. Be in a contest to name the capitals of countries                       | B 31. Talk about poems in class  |
| B 12. Take a course in the modern novel                                       | B 32. Use clever short cuts to certain mathematical calculations   |
| B 13. Prepare to become a building contractor                                 | B 33. Study child growth and mental development  |
| B 14. Add and multiply very rapidly and correctly                             | B 34. Study conflicts between various social groups  |
| B 15. Study the role of social factors in the development of personality      | B 35. Read about the latest thinking in theology   |
| B 16. Identify the various orders of types of architecture                    | B 36. Study principles and techniques of acting  |
| B 17. Study the nature of human groups and group life                         | B 37. Study principles of design and location of highways  |
| B 18. Compare and contrast Catholic and Protestant doctrines                  | B 38. Study the process of pollination and fertilization of plants   |
| B 19. Read various writers' descriptions of what an ideal world would be like | B 39. Listen to debates and discussions on social, economic and political problems                                   |
| B 20. Participate in dramatics  | B 40. Seek from art forms some idea of the dominant thought and feelings of their period                             |
|   | B 41. Observe the techniques for handling carcasses in the meat industry   |
|   | B 42. Reading about the history of economic thought  |
|   | B 43. Be interested in the historical changes and developments in jazz   |
|   | B 44. Study the breeding habits of migratory birds   |
|   | B 45. Study the financial situation confronting the United States  |
|   | B 46. Study chemical processes and changes   |
|   | B 47. Compete in a school essay writing contest  |
|   | B 48. Learn which famous mathematicians developed certain portions of mathematical theory                            |
|   | B 49. Study the principles of human behavior   |
|   | B 50. Talk to the head of a model prison   |
|   | B 51. Study how certain characteristics of plants and animals are inherited and how they may be improved by breeding |
|   | B 52. Read about international spies   |
|   | B 53. Read about the lives of great artists  |
|   | B 54. Talk to a dairy farmer about his methods for improving milk production in his herd                             |



KEY: 1. Definitely like  
2. Like  
3. Dislike  
4. Definitely dislike

- B 55. Compare communism and capitalism
- B 56. Study the music of particular composers such as Bach and Beethoven
- B 57. Read about the causes and effects of forest fires
- B 58. Study laws and court decisions which apply to business
- B 59. Test the chemical and physical properties of minerals
- B 60. Seek in literary works expressions of the dominant thought and feelings of their period
- B 61. Formulate and solve algebraic equations
- B 62. Learn to write a personal advice column for newspapers
- B 63. Be aroused by a speaker's description of unfortunate conditions in a locality or country
- B 64. Take a field trip to find animals
- B 65. Read about royalty
- B 66. Go to see a fine motion picture
- B 67. Study the effects of tariffs on agricultural prosperity
- B 68. Study principles of interpretation of musical compositions
- B 69. Learn what specific steps can be taken to preserve a species of animal in danger of extinction
- B 70. Study libel case trials and libel laws
- B 71. Learn the processes for identifying underground oil deposits
- B 72. Read novels
- B 73. Study the development of social and political systems
- B 74. Learn how to get natural photographs of wild animals
- B 75. Study the effects of planting practices on crop yields in farming
- B 76. Study methods and principles of planning a musical program
- B 77. Read and study poetry
- B 78. Read about famous people in public life

\* \* \* \* \*

PART 2 ACADEMIC ATTITUDES

The statements that follow represent attitudes or feelings you may have about academic work and about being in school. Use the following Key for marking your responses to questions B79-B130 and C1-C69.

KEY: 1. Strongly agree  
2. Agree  
3. Disagree  
4. Strongly disagree

Answer every item.

- B 79. I usually try for no more than a passing grade unless I really like the course.
- B 80. When I have an instructor who lectures in a monotone, I frequently almost go to sleep and miss most of what he says.
- B 81. I have been doing about as well in school as I am able.
- B 82. I am seldom interested in a class in which the material has little practical value.
- B 83. I have many close friends and am on friendly relations with almost everyone.
- B 84. My grades are markedly better in courses I see I will need later.
- B 85. I like to join in on heated discussions about controversial issues.
- B 86. I seem to enjoy school more than most people.
- B 87. I seldom get behind in my studies.
- B 88. I am generally satisfied with grades as long as they are passing.
- B 89. I believe the extra-curricular activities of college are every bit as important as academic activities.
- B 90. My basic purpose in college is to prepare myself for a good job.
- B 91. I feel that I drive myself harder than most people.
- B 92. I feel that a person is studying hard enough if he does well enough to pass the examinations.
- B 93. I tend to be more practical than theoretical.
- B 94. I believe sentiment should not color one's thinking.
- B 95. I feel that schools should stress more practical things.
- B 96. I do my assigned readings even if I am not interested.
- B 97. If I could devote more time to study, I would probably do much better in school.
- B 98. When I'm in the mood, my study really pays off; while at other times, it is hardly worth the effort.
- B 99. I take to heart critical comments instructors make on my papers.
- B100. I probably study as hard or harder than most students in my classes.
- B101. Class work toward the end of the semester is seldom as interesting as work early in the semester.

KEY: 1. Strongly agree  
2. Agree  
3. Disagree  
4. Strongly disagree

- B102. My written assignments are seldom turned in late.
- B103. If I didn't have as many personal problems outside of school, I would do much better in school.
- B104. I usually find something of interest in every course I take.
- B105. I seldom find it necessary to "cram" for an examination.
- B106. Sometimes I wonder whether I belong in college.
- B107. If I were offered a good job now, I would turn it down rather than quit college.
- B108. I work best in courses that I feel will be of value later.
- B109. I try to study during free hours in the day so as to reduce the evening's load.
- B110. I believe the prestige value alone justifies the expense of attending college.
- B111. Learning to get along with other students is as important a part of school as acquiring knowledge.
- B112. Many students tend to take their studies too seriously.
- B113. My written papers are often criticized for being full of grammatical errors.
- B114. I have trouble keeping up in courses that require much reading.
- B115. I generally find that school libraries have all the books which I wish to see.
- B116. I have had several courses which never did interest me.
- B117. I feel that school is giving me a good preparation for the time I finish school.
- B118. I usually study a lot on some days but not on others.
- B119. My grades usually reflect the amount of time that I spent in study for that course.
- B120. I often find my work in some courses so interesting that I tend to neglect my work in other courses.
- B121. There are a number of courses I would have taken if my high school had offered them.
- B122. I seem to read and understand as well as most students in my school.
- B123. I feel I could master any subject if I tried to study hard enough.
- B124. The things I do in school are almost always satisfying and important to me.
- B125. My parents think I am doing quite well in school.
- B126. I usually work as hard as possible in all my classes.
- B127. I sometimes neglect other classes when I need to "bone up" for a certain test.
- B128. I seldom find study to be a tedious chore.
- B129. I feel that students should not be forced to take courses in areas that are of little interest to them.
- B130. One is generally better off to have but a limited number of social contacts.
- Put aside answer sheet B and mark your responses to items C1-C130 in the appropriate spaces on answer sheet C. (Continue to use the same Key until instructed otherwise.)
- C 1. I feel that many students try to cultivate too many friendships.
- C 2. I prefer that social activities also have some educational value.
- C 3. I believe the Russian system of education which minimizes the social and extra-curricular has many advantages.
- C 4. With improvements that have been made in education, I would like to see a college degree three years rather than four.
- C 5. Colleges should carefully limit the number of extra-curricular activities available to students.
- C 6. I wish I could make friends more easily.
- C 7. I believe that college should be made easy enough that everyone with an interest and desire can get in.
- C 8. One index of the value of certain ideas and knowledge is to see how far they have gotten the scholar (teacher) who is teaching them.
- C 9. Theories must have a definite practical significance before they are really worth studying.
- C 10. Getting along with people is not as important as learning to get things done.
- C 11. I feel I tend to read too many different things instead of studying a few things well.
- C 12. I get my best ideas by thinking alone rather than from books or so-called experts.
- C 13. I believe that many people tend to spend too much time studying history when we should study the present and the future.
- C 14. One should spend more time studying the works of a few great thinkers than the thousands of others who make small contributions.
- C 15. I tend to find the writing of a term paper more disagreeable than searching for the ideas to write about.
- C 16. The most important thing about college is preparing for a career.
- C 17. I often pretend that I agree with a teacher after I see that he has made his mind up.
- C 18. I like taking courses or reading books which probe deeply into the basic ideas of a subject.
- C 19. I like thinking about problems that are a challenge to even the specialists in the area.
- C 20. I am becoming more interested in the practical applications of a theory than in critical analysis of it.
- C 21. I feel that science contradicts religion only when scientific hypotheses have not been properly made or tested.

- KEY: 1. Strongly agree  
2. Agree  
3. Disagree  
4. Strongly disagree

- C 22. I would enjoy becoming well read in a variety of areas.
- C 23. I enjoy correcting errors in spelling and grammar in papers I may read.
- C 24. I dislike studying books written in a foreign language.
- C 25. I enjoy studying stock market trends.
- C 26. I dislike spending my time thinking about and discussing complex problems.
- C 27. I feel that my interests lean more toward research than practical application.
- C 28. I feel that scientific research is not as practical as it should be.
- C 29. I would rather carry out a skillful job rather than doing the planning for it.
- C 30. I often question the accuracy of statements made in my textbooks or reference books.
- C 31. I think about the practical utility of a college education.
- C 32. I would prefer entering a profession that requires much original thinking.
- C 33. I would rather have principles or theories explained to me than having to learn them on my own.
- C 34. I like to have long involved problems to work on rather than short concise ones.
- C 35. I prefer to show originality in my school work rather than perfection.
- C 36. I question statements and ideas expressed by teachers if I disagree with them.
- C 37. I prefer not to expect too much in order not to be disappointed.
- C 38. I would rather be more realistic than idealistic -- that is, more "down-to-earth."
- C 39. I would prefer doing work which requires little study or thought once it is learned.
- C 40. I feel that the artist and professor are more important to society than the businessman or manufacturer.
- C 41. I would prefer being regarded as a practical man rather than a man of ideas.
- C 42. I enjoy being in classes that require much library work.
- C 43. I dislike being in classes where the instructor specifies in detail what must be done.
- C 44. I would prefer working on a theory or problem that has no apparent practical application.
- C 45. I believe that a person must be highly specialized to really succeed after college.
- C 46. I believe that college is a good financial investment.
- C 47. I feel that class discussions are more profitable than lectures.
- C 48. I feel that social activities might well be best restricted to weekends and study for weekdays.
- C 49. I feel that the main assets in college are academic in nature.
- C 50. I would like to increase my capacity for effective thinking.
- C 51. I like to talk about painting, sculpture, and other arts with people who are interested in them.
- C 52. I prefer being in courses that require much library work.
- C 53. I like to have people drop in on me when I am studying.
- C 54. I feel that my grades could be much higher if I tried to study more.
- C 55. I like using an hour or so between classes for study rather than being with friends.
- C 56. I enjoy arguing with an instructor or superior.
- C 57. I dislike being in classes in which the speculative or abstract is emphasized rather than the concrete and tangible.
- C 58. I feel that examinations given in school are quite fair.
- C 59. I would like to become an expert in finance and commerce.
- C 60. I believe that a highly educated person is often conceited.
- C 61. I usually take careful notes to be sure I don't miss what the instructor says.
- C 62. I prefer to study alone rather than with other students.
- C 63. I like going to school.
- C 64. I usually take notes when reading my assignments.
- C 65. I prefer being in courses in which almost everyone really works.
- C 66. I usually don't try for a passing grade unless I really like the course.
- C 67. My preference is for doing actual laboratory work rather than studying a textbook.
- C 68. It slows me down to be with students who work much harder in given courses than I do.
- C 69. I often freeze up when taking examinations.
- \* \* \* \* \*

APPENDIX III

COURSE

QUESTIONNAIRE

Fall Quarter  
1965

By answering this questionnaire you will be helping the University in a very important way to evaluate different methods of instruction. This evaluation will not be made until after your instructor has turned in your final grade, and your answers to these questions will not affect your grade. Your careful consideration will help the University improve instruction methods used in the future.

INSTRUCTIONS: Fill in the top three lines on the answer sheet supplied. Print the information with the soft lead pencil given to you. In the box at the right top of your answer sheet, fill-in the correct blanks for your student number.

Respond to the following statements by blackening the space on the answer sheet which, according to the key below, best describes your reaction to the statement.

KEY: 1 - Strongly agree  
2 - Agree  
3 - Uncertain  
4 - Disagree  
5 - Strongly disagree

1. The visual materials used in the lectures helped me to understand the subject matter of this course.
2. I had no difficulty seeing the lecturer or the materials he presented.
3. This course has been among the most interesting I have taken.
4. I felt the need to ask questions which were not answered in the lecture or discussion part of the course.
5. The lecturer normally has taken enough time to clarify one aspect of the subject before moving on to the next aspect.



KEY: 1 - Strongly agree  
2 - Agree  
3 - Uncertain  
4 - Disagree  
5 - Strongly disagree

6. Students taking this course by television will receive lower grades than those students who are in the same room with the lecturer.
7. I have had a satisfactory opportunity to contact my instructor when I had problems that required his personal attention.
8. Often there wasn't enough going on during the lectures to hold my attention.
9. I sometimes didn't know that was going on in this course with regard to assignments, lecture topics, examinations, etc.
10. I feel I have learned a great deal in this course.
11. I would have done better in this course if it had been easier to discuss problems with the lecturer.
12. This course has forced me to do much of the learning myself.
13. I have often thought about the subject matter of this course outside of the classroom.
14. I found my attention wandering frequently during lectures.
15. As a result of these lectures, I will probably take additional non-required courses in this area.
16. I could always hear the lecturer in this course.
17. The course lecturer plays a major role in determining my grade.
18. The purpose of these lectures was to teach facts and information.

KEY: 1 - Strongly agree  
2 - Agree  
3 - Uncertain  
4 - Disagree  
5 - Strongly disagree

19. The purpose of these lectures was to teach general principles and generalizations.
20. The purpose of these lectures was to teach application and problem solving skills.
21. The purpose of these lectures was to teach attitudes and appreciations.
22. The purpose of these lectures was to instill a desire for further learning.
23. I intend to take as many TV courses as fit into my schedule.
24. I will recommend TV courses in general to others.

Rank questions 25, 26 and 27 in order (darken the 1 space on the answer sheet for the most preferred, space 2 for the next preferred and space 3 for the least preferred).

The best way to get the lecture materials for a course is to:

25. Attend a lecture delivered by an instructor in a large lecture hall on campus.
26. Attend a lecture presented by television to a small campus classroom.
27. Attend a lecture presented by television in a small dormitory classroom.



KEY: 1 - Strongly agree  
2 - Agree  
3 - Uncertain  
4 - Disagree  
5 - Strongly disagree

28. I have attended evening review sections

1. never
2. once or twice
3. on several occasions
4. many times
5. always

29. I have viewed the television lectures in other regular sections

1. never
2. once or twice
3. on several occasions
4. many times
5. always

30. My major reason for taking this course is that it was:

1. a free elective
2. recommended by my advisor
3. closely related to my major field
4. a part of my major
5. required for graduation

31. My major is

1. Arts & Letters, Comm. Arts,  
Justin Morrill College
2. Social Science, Natural Science
3. Education, Business, Home Economics
4. Agriculture, Engineering, Vet.  
Medicine
5. Non-preference

KEY: 1 - Strongly agree  
2 - Agree  
3 - Uncertain  
4 - Disagree  
5 - Strongly disagree

32. I am a

1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Graduate Student

33. My accumulative grade point average is

1. below a 2.0
  2. between 2.0 and 2.49
  3. between 2.5 and 2.99
  4. between 3.0 and 3.5
  5. above 3.5
- (If not established, leave blank.)

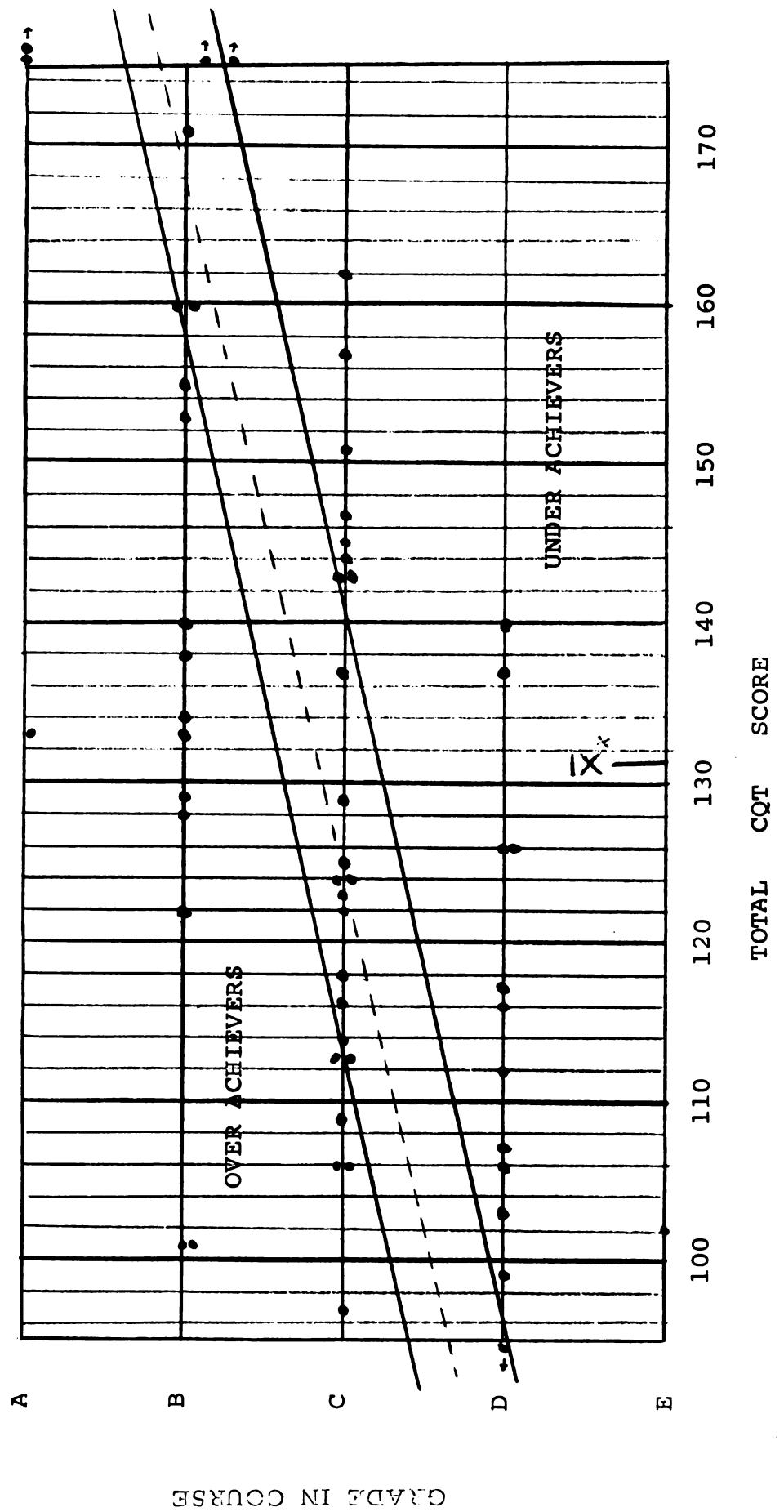
34. I expect my grade in this course to be

1. F
2. D
3. C
4. B
5. A

APPENDIX IV

APPENDIX IVa

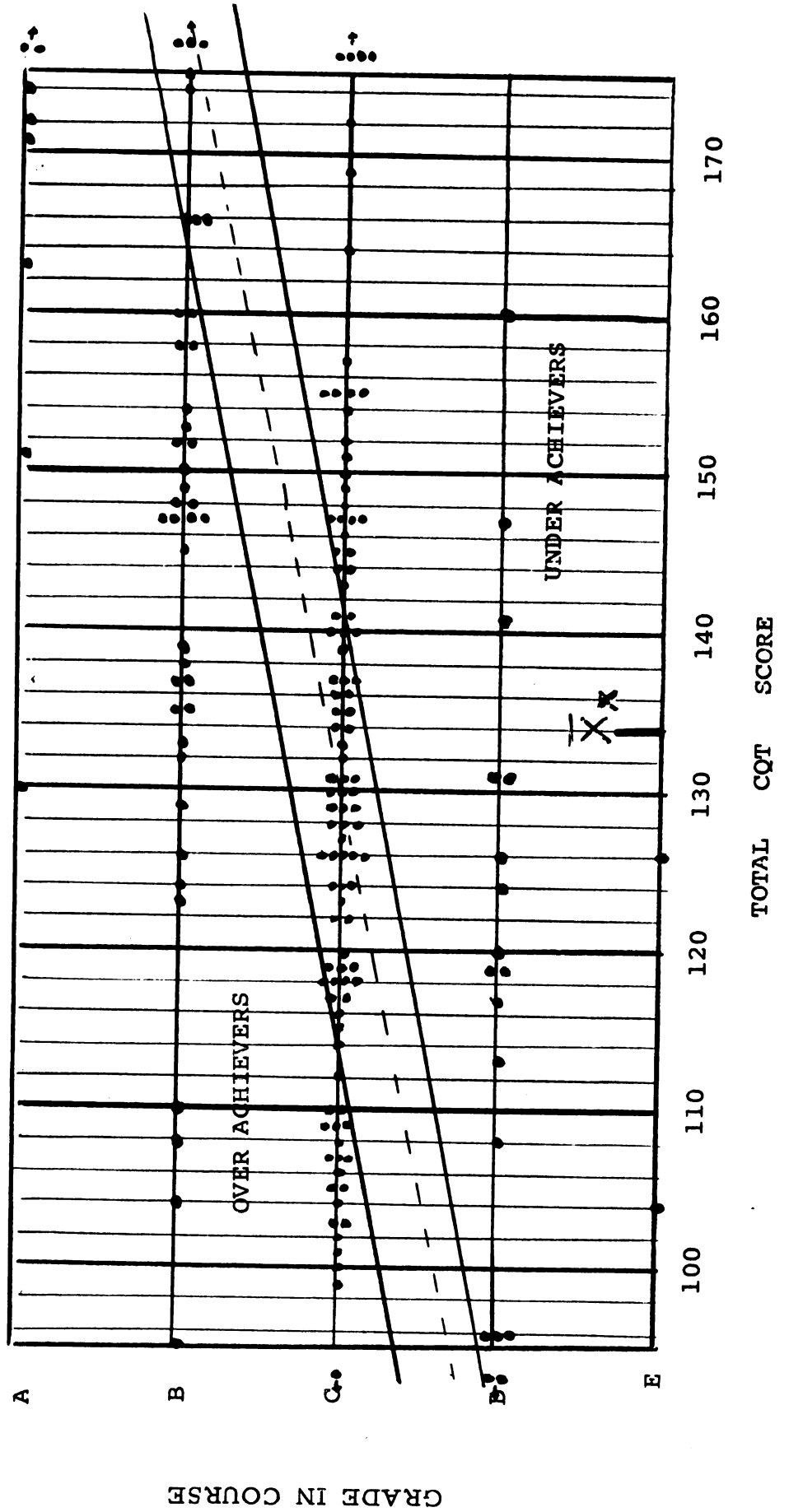
SCATTER PLOT INDICATING APTITUDE AND GRADES OF  
STUDENTS IN ATL 111: FACE-TO-FACE GROUP





APPENDIX IVb

SCATTER PLOT INDICATING APTITUDE AND GRADES OF  
STUDENTS IN ATL 111: TV GROUP



APPENDIX V

APPENDIX V

INTERCORRELATIONS FOR 4 7 VARIABLES

FOR STUDENTS IN ATL 111, Fall, 1965

Course Grade	Sex	Age	Parent Nativity	Homeborn State	Type H.S.	Standing in H.S.	H.S. Activities	Church Attend.	Ed. of Father	Father's Job	Mother Employed	Years Coll. Des	Years Coll. Exp	Outside Job	Source of Funds	Expected Dating	Expected Activity	Exp. Pac. Cont.	Exp. Prejudice	Lit. Interest	Int. Aggress.	Self-concept	Grade Aspire	Self-confidence	Theory Orient.	Academic Goals	Act. Ex-curricu-	Practical Educ.	Reading Ability	Verbal Ability	Info. Level	Course Eval.	Learner Cont.	Sees/Heard Lect.	Concentr. Lect.	Why in Att 111	Expected Grade	Absences	Final Exam	Final GPA	Attan/Non-Attan	QT Total	# Rev. Sessions
--	107	06	033	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
108	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
109	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
110	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
111	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
112	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
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118	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
119	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
120	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
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127	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
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129	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
130	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
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136	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
137	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
138	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
139	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056	213	012	060	412	186	376	497	000	474	007
140	029	064	036	001	069	206	133	018	064	118	066	036	137	191	162	097	043	016	095	006	162	067	163	169	071	162	253	030	393	313	266	381	056										

Above the diagonal: TV sections.

Below the diagonal: Face-to-face sections



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