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ABSTRACT

This pilot study was a limited exploratory investigation of certain aspects of visual symbolization ability in matched pairs of literate and illiterate adults. It was asserted that written symbolization serves as an economical means of reality comprehension and testing. This basic function of symbolization must be learned and accepted psychologically as an essential operational premise if symbols are to be employed profitably. It was argued that the failure of the illiterate to accept this premise may account in part for his illiteracy. The performance level was first tested on symbol items which were visually tied to "real" things. The attention span of the two samples were tested on a paper-and-pencil task. Finally, an instrument using abstract symbols was administered. The results were in the direction predicted. Further studies seem warranted to differentiate the several factors involved. (Nine tables and 16 references are included.) (author/ly)

THE PSYCHOLOGICAL AND MYTHMAKING PHENOMENA IN VISUAL SYMBOLIZATION OF ADULT ILLITERATES

WISCONSIN RESEARCH AND DEVELOPMENT

CENTER FOR COGNITIVE LEARNING

Technical Report No. 93

THE PSYCHOLOGICAL AND MYTHMAKING PHENOMENA IN VISUAL SYMBOLIZATION OF ADULT ILLITERATES

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Report from the Adult Re-Education Project
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Center for Cognitive Learning
The University of Wisconsin
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This study is a product of an activity which was supported when the Center was first established in 1964. At that time one of the areas of interest was adult re-education. To narrow the focus of the Center in order to more efficiently attack instructional problems in elementary education, this and other projects were not continued. The objectives of the Adult Re-education Project were to determine the relationship of adult education to other disciplines, to establish a framework for classifying areas of needed research and to determine appropriate means of teaching adults both in continuing-education programs and in new educational undertakings. In this Technical Report is described a feasibility study investigating the symbol development of adults at a low socio-economic level.

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ABSTRACT

This pilot study was a limited exploratory investigation which examined certain aspects of visual symbolization ability of matched pairs of literate and illiterate adults. It was asserted that written symbolization serves, as an economical means, reality comprehension and testing. This basic function of symbolization must be learned and accepted psychologically as an essential operational premise if symbols are to be employed profitably. It was argued that the failure of the illiterate to accept this premise may account in part for his condition of illiteracy. The performance level of the subjects was first tested on symbol items which were visually tied to "real" things. The attention span of the two samples were tested on a paper-and-pencil task. Finally an instrument employing abstract symbols was administered. The results were in the direction predicted. Further studies which could differentiate the several factors would appear to be warranted from the results of this pilot study.

I
THE PROBLEM

The project reported here was an initial exploratory study comparing the abilities of illiterates to literates on their relational comprehension of symbols. Specifically the project gathered data on the achievement levels of matched pairs of illiterate and literate adults on relational comprehension of symbols using tests that did not employ linguistic symbols.

The thesis that was tested in the study was that there is some blockage on the part of certain individuals to the learning of symbols as a means of categorizing the "real" world around them. The blockage is not so pervasive as to include all forms of symbolization. The illiterate has learned to use verbal symbols. Most illiterates have learned to use simple numerical symbols. It is argued here that when symbols as representations of the "real" world are increasingly made more abstract (less directly visually tied to those things for which they "stand") the blockage increases in strength. An explanation for this blockage is discussed in a subsequent section. The exploration to determine whether there are "grounds" upon which to assert the existence of such blockage is the purpose of this study.

The project was conceived as an initial investigation in a series of increasingly sophisticated studies. Because of the initial exploratory nature of the study the design was very simple. In the first experiment the subjects were given a pencil-and-paper test. The questions on the test were all of the same type. The subjects were given four design sketches of a box and a picture of an assembled box. The subjects were requested to match the corresponding design to the assembled box. These symbols were very close to "real" things because they were pictures of "real" things. The next experiment made use of a test that from the first subtest to the last subtest increased the relational reasoning employing symbols. That is to say, so far as this one aspect of language was involved, these symbols became more linquistic in nature. It was hypothesized that the illiterates would not achieve as well as the literates. If the hypotheses were supported, the result would encourage further investigations on the thesis set forth in this paper.

BACKGROUND

The fact of illiteracy in the United States has been forceably brought to the attention, not only of educators, but to those of all levels of government, and to the social awareness of large segments of the American people. Illiteracy is more wide-spread, and percentage-wise, much greater than most of us had realized, and than most Americans would like to believe. Many explanations have been offered. Some have been supported by careful observation gained from first-hand experience. Other explanations have been based on opinions, biased judgments, and outright hostility. Few explanations have been built on research primarily, because there is very little research that is directly addressed to the problem.

There is a great deal of research on "why children fail" (Robinson, 1946) to learn to read and the difficulty they have in learning to improve their reading. In addition, there is a growing body of knowledge about reading problems at the secondary and college levels. However, except for the research on causes for children failing to learn to read, the remaining research literature would not appear to be relevant to the present study. The studies on reading failures may shed a good deal of light on the subject of illiteracy of adults. Before an examination of these studies is made, the commonly ascribed causes of illiteracy should be considered.

It is illuminating to examine the more prevalent positions which are held regarding the causes and antecedent conditions of illiteracy. Among the more prominent arguments which

have been voiced is the position taken by some people that illiteracy is highly correlated with low intelligence. The inference, indeed, the statement made by some, is that the illiterate is illiterate because he has low intelligence. Of late, the innate aspect of the question has been de-emphasized and the social milieu has been more generally considered. Thus, an increasing number of authorities are making the argument that low intelligence and illiteracy in many cases may be the product of a culturally deprived environment. These is evidence to support this position. It is not difficult to perceive the dynamic interrelations which can be argued to exist between illiteracy (and literacy) and intelligence.

Inquiries in this area are extremely involved. The author has been witness to a score of case studies in which the teachers describe the intellectual capabilities of illiterates increasing most noticeably as they gain in their abilities to read. A series of questions arise essentially concerning possible changes in self-esteem as this affects more aggressive behavior. An individual appears to be (and may be) more intelligent because he is now able to assert himself. It is more than an academic question of how intelligence is defined and measured. According to those who have worked closely with the illiterates, the illiterates, as they increasingly master the abilities to read, become more involved in situations, with other people, more aware, more attentive.

Disregarding the complexity of measuring intelligence, what demographic data are there on the untrainable or uneducable? The United States Census of 1968 sets the illiteracy rate in this country at 8.3%*. The percent for mental retardation which may include a good number of educable individuals is placed at about 4%. Discounting the educables within the 4%, there is still left 6% classified as illiterates. In general terms, this means that 6 out of 10 illiterates may be assumed to be within range of normally educable adults. It would seem, in view of these statistics, that the question of low intelligence more adequately describes a superficial and correctable condition than a permanent road block to a literacy program.

The impact of these statistics serves to redirect our focus to other explanations concerning the causes of illiteracy. Frequently, the lack of motivation is given as a reason. There are two major misconceptions imbedded within this explanation. First, although it may appear to describe the present condition, the explanation affords little help because it leaves unexplained the genetic causes for either the lack of motivation or the reason for the initial failures of the individual in learning to read. Secondly, lack of motivation is not itself a cause but a description of an attitudinal predisposition. The predisposition may be more operationally understood by raising the question as to what has brought the condition of low motivation into being. This question leads to another set of explanations.

Another set of explanations consider the condition of illiteracy as an open wound of a social disease: disease inbred and aggravated by poverty, race, and social class structure. It is inbred in the sense that whole families are illiterate. An illiterate brother associating with other illiterate friends brings to the limited circle of acquaintances potential husbands for his sister(s). The lack of skills and ignorance of middle class behaviors and mores greatly handicap any attempt on the part of the illiterate at escaping from his condition of poverty and ignorance.

Other observers, in their appraisal, ascribe the presence of illiteracy to laziness, a by-produce of feeding at the "public trough" (welfare recipients). These observers advise us to examine the illiterate's job-holding history, his work patterns, and his conceptions of responsibility. What such people want us to see is that many (they maintain "most") illiterates do not subscribe to middle class values and behavior standards. And it is these values that are "American."

Many teachers who have worked closely and sensitively with the illiterate have told of the illiterate's initial behaviors of arriving late to class or not at all, of evasion and prefabrication, of giving up, flighting, and procrastination, and at times being immaturely destructive of property. Seeing and hearing reports of such behaviors would seem to provide a hard reality to the position that the illiterate

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*This figure is from Statistical Abstracts of the United States, 1968, the 89th Annual Edition, William Leaner, editor, published by United States Bureau of the Census, Washington D.C. (p. 110, Table No. 156). The figure 8.3 is the per cent of those people who completed less than 5 years of schooling and are accordingly considered functional illiterates. The illiteracy population figure is given as 2.2 (1959, Table No. 1274, p. 866). This figure includes only those people who were reported as not having any formal schooling in the United States. The author agrees with other authorities in the field who take the position that the 8.3 figure is closer to the percentage of illiteracy than the 2.2 figure and accordingly has accepted the 8.3 figure.

is an inferior type of man. Such an inference, although seldom made public, is unmistakably there to be taken. The "hard-line" position maintains that the illiterate must be made to change, to "shape-up," or be taken off public welfare rolls. Such positions taken towards illiteracy are basically hostile. The reality that such positions rest upon is a narrow perception of that which now exists rather than on a knowledge of the interdependent causal forces in human affairs and the concept of development in human living.

The teachers who were previously quoted describing the negative aspects of the illiterate's personality go on to report other attributes which reveal an entirely different configuration of the illiterate's personality. It is this part of the human condition the "hard" realist does not wait to hear. Many teachers describe the illiterate as timid, unaggressive, really basically afraid of the larger society, and certainly exhibiting a good deal of apprehension of that which is unknown to him. Most teachers report that as the illiterate progresses into literacy he increasingly becomes more responsible and more responsive. He grows in his trust of himself and those with whom he has dealings.

As you watch an individual emerge from illiteracy you often find yourself questioning the longevity and origin of the problem. It seems ridiculous to say it is associated with economic problems directly. One only needs to raise the question: What concern does a Grade One or Two child have for vocational employment? It seems fairly remote that children of this age would be discouraged to learn because they may know there are few opportunities for employment. The parental attitude of the non-utility of schooling may be a factor. This is a different consideration than the child's linkage of schooling to his vocational future. It is much more reasonable to assume that once the failure to have learned the abilities to read has been experienced, the continuancy of illiteracy could be tolerated in the realization of few occupational opportunities. The argument is that poor economic conditions support the continuance of illiteracy but does not directly bring it into being.

The word directly is advisedly employed in the previous paragraph. Sufficient evidence is now being amassed to clearly indicate that a culturally deprived home depresses the learning potential of the children who live in it. This is, in part, an economic matter. The poorly equipped school and the inadequately trained teacher are closely associated with illiteracy. These are economic matters. The ill child with inadequate medical care and a sub-standard diet is frequently reported in illiteracy case studies. These are economic matters. In view of these considerations, the concern about direct or indirect causes may appear to be an evasion of the unpleasant by holding the discussion to an academic level. Such is not the case or the intent.

Not all illiterates grow up in a community of illiterates. Many of the people the illiterate associates with and has as close friends can read and write. The home environment of his friends has often not been appreciably different than his. Many in his community who have learned to read and write have gone to the same school he has and have had, in many cases, the same teacher. It is true that illiteracy in some sections of the nation is a family phenomenon, but in other sections a sister, more generally a brother, may be illiterate in a family where all other members of the family have learned to read and write. These data are case studies and have been collected without the objectivity of sampling procedures. Notwithstanding, these data raise an important and provocative question.

If environment were a predominate force in creating illiteracy, then what can account for the failure of this factor to affect individuals more uniformly?

The answer is obvious. Simply put, there is no one answer that explains the cause of illiteracy. It should be further expected that there will be shown to exist a wide variety of interdependent causes, and that these may be shown subsequently to exist in a number of distinct patterns.

It is from this position that the present study proposes an investigation into the causes of illiteracy. The thesis to be examined herein provides only one possible cause of illiteracy. In addition, it is assumed that multicausal explanations are more accurate descriptions of the genesis of illiteracy than unicausal explanations. Although only one major thesis for the causes of illiteracy is advanced in the section which follows, the investigator is fully aware of, and accepts the position of, multicausal explanation of human behavior. The purpose of the present study is to differentiate one possible set of factors which may cause illiteracy.

DEFINITIONS

Before discussing the theoretical framework of the study it is necessary to have clear meanings for certain naming words used in the study.

An illiterate, for purposes of the study, is one who can not read even the simplest of sentences. He may recognize a very limited number of words but their symbolization value in

linguistic functions is nil. Only native-born Americans who were monolingual were included in the study.

A literate is one who is able to read the local newspaper. He was monolingual and a native-born American.

An adult is one who was considered by the community in which he lived to be "no longer a child but a man or woman." He was considered by his community to have "normal" intelligence. If he was of advanced age he was still considered by his community to have still his "normal faculties."

A symbol is a configuration made on a two-dimensional plane that represents something in the "real" world. The word "real" is placed in quotation marks to indicate, that for the purposes of the study, certain individuals perceive a division between the world which can be seen as having existence and the "marks on paper" which stand for the thing perceived. A symbol, as used in this study, is not verbal. In the sense in which symbol is employed here it can be a drawing, a sign, a mark, a character, an emblem, etc.

Symbolization is the act of associating a symbol to the thing for which it stands. The using of symbols to solve a problem or puzzle or answer a question. The translating of the thing into the symbol by which the symbol now stands for the thing.

II

THEORETICAL FRAMEWORK

Many scholars have been intrigued by the relationships between words and the religious expressions of man. The diligent work of these scholars has yielded many insights about the spoken and written word in religion and in magic. There is no known culture that has not perceived words as having certain powers as an integral part of their being. Prayers are a common ritualized employment of words that under certain conditions may have power over certain gods to have them act in a requested manner. Certain American Indians would not speak aloud the true names of their children lest the "evil ones" would, by the knowledge of these true names, have control over the children. The more technologically advanced cultures have taken the "sacred" words related to the teachings and histories of their religious expressions and made "holy" writings. The essential difference is that the spoken word has become the written word and has a permanence that can be visually perceived. The permanence of the existence of these "sacred" words has at no time been dependent on their visual symbolization. They are perceived as having a life quite independent of man.

It is difficult to separate the magic aspect from the religious aspect in a specific culture's employment of words. It has been argued that it is meaningless to try to separate these aspects because, if they are not the same phenomena, then at least they are aspects on a continuum. The carefully documented work of Cassirer (1946) leaves little doubt to the veracity of the relationship between the words of magic and the words of religion.

The American culture is not freed from the magic that is perceived to exist in words. The generalization can be made that as there is less formal education within a given subculture there is correspondingly more evidence that the individuals in the subculture believe that magic can be expressed through words and that words under specified conditions possess magical attributes. Certain forms of this behavior may be argued as residue of previous beliefs but can not be accepted now as evidence of the magic in words: for example, the curse one may fling inaudibly at someone who has succeeded in disturbing him in some manner. The hammer "that hit my thumb" (notice the anthropomorphism) frequently is cursed. There are such expressions as "those words will come back to haunt you." "If you say it, it may come to pass." Making the Sign of the Cross after someone has said something that is considered "evil" disregards the thought and gives power to the spoken word. We talk about things coming into being through the spoken word, vis-a-vis, "you shouldn't have said that." The meaning in this context is that now some evil will befall you (or someone else) because you have given "life" to a previously hidden (unborn) thought.

Cassirer stated very clearly the relationship between words that name and the objects that are named.

> The notion that name and essence bear a necessary and internal relation to each other, that the name does not merely denote but actually is the essence of the object, that the potency of the real thing is contained in the name—that is one of the fundamental assumptions of the mythmaking consciousness itself. (Cassirer, p. 3)

The mythmaking consciousness that Cassirer speaks of is handed from one generation to another through systems of direct, but informally structured, education. In many ways the acceptance of magic may be reinforced by everyday perceptions or interpretations of experiences. Every normal child learns the power of names. Naming brings mother, toys, attention, and food. It is a small step in thought association to come to believe that knowledge of the name gives the person who possesses

the knowledge mastery over the thing or person being named. In subculture where mythmaking has an accepted place it is easier for the child to generalize the magic of naming.

Out inquiry has now begun to raise questions concerning the psychological development of an individual as related to mythmaking. Specifically, we are concerned with words. There has been sufficient evidence presented in the research literature of psychology to support the position that words are vested with psychological meaning. The meaning is frequently unknown to the individual. It was the brilliant work of Freud (1938) that brought this insight to the attention of psychologists. Freud's work opened up an area of inquiry which has subsequently been termed the study of symbolism. The writings on this subject are numerous and esoteric. Certain of these contributions are very relevant to the study which is reported in this paper.

Blanchard (1946) discusses the more relevant aspects of psychoanalytic literature that treat learning to read. There appear to be two broad types of resisting or blocking to learn behaviors. One type may be characterized by the child refusing to learn, thus employing this behavior as a weapon against parents and subsequently against society. In one form this may be a more fundamental refusal to accept the responsibility for one's own development. In another form the refusal may be an expression of the great antagonism of a child to his parent(s). (There are, of course, antecedents to these forms of behavior. It is beyond the immediate focus of this paper to discuss these antecedents.) The second type of blocking to learning of symbols (words) results from the repression of oral and anal fantasies. These fantasies stand in the way of the sublimation of instinctive drives. The fantasies are frightening and so the child seeks escape from those experiences that may arouse such fantasies. Pearson and English (1937), Pearson (1954), Strachey (1930), and Jones (1912) provide further data to substantiate Blanchard's findings.

The phenomenon of symbolism that psychoanalysis has shown to exist may be tied directly to mythmaking. That is to say, if words are vested with psychological meaning and thereby taken on some form of force by their very existence, it is not difficult to then perceive uses of words as being omnipotent means for good or evil.

The argument which I have briefly outlined above began to form during an extended series of visitations to many illiteracy centers throughout the United States. I observed the teaching and learning. I discussed the many facets of illiteracy with experienced teachers. In connection with my own studies on human behavior, these observations and discussions began to point to the position I have subsequently taken in this paper. I think it is appropriate at this point to weave into the theoretical framework of the study some of the pertinent observations made by experienced teachers and myself.

These teachers informed us about many generalized characteristics of illiterates during the initial stages of illiteracy programs. Most illiterates experience great difficulty in accepting time and work responsibilities. These relations with the teacher are in many respects as a child to an adult. This appears to be true even with those teachers who honestly attempt to establish an adult-to-adult culture. This cultural relationship is achieved but only slowly. Some teachers are used as models, much as adolescents use certain adults as models. In general, the adult illiterate in the teaching-learning situation does not act initially as a mature autonomous adult. He seeks a great deal of encouragement, direct help, and guidance. It appeared to me that these people were overcoming an attitude of immaturity; an immaturity that had provided them the means of escaping the responsibility for the utilization of knowing that comes from learning (Liss, 1941).

Listening to the teachers and guidance counselors who had worked closely with illiterates, it was a common experience to hear them describe the illiterate person in certain specific terms. An illiterate is not an aggressive person and those that appear to be hostile are "putting up a front" to cover a deep feeling of inadequacy. He feels left out of the main stream of society. He feels rejected and perhaps is rejecting himself. Some teachers describe many illiterate individuals as being afraid, timid, and even intimidated by life. "Learning" is what other people have and this "learning" has power over them.

It was with this latter insight that I raised the questions of magic and mythmaking with the more perceptive teachers. Their observations were most germaine. These teachers describe the beginning adult reader as being "awed" by the power of his reading, as if he had unlocked doors to hidden treasures. These teachers have sought an explanation for the tremendous amount of repetition that appears to be necessary in the initial learning stages for these adult illiterates. It appeared that there was some form of a "block" to their learning. Undoubtedly this phenomenon may be explained on several levels; for example, inhibition induced by failure. It is equally possible to argue that as adults it was now necessary for them to overcome the repressed oral and

anal fantasies they experienced as children at the time they were being taught to read. As adults, their desire to learn to read has become such a strong force in their lives, they now are able to sublimate their instinctive drives. Initially the process is slow, emotionally expensive, and demanding. This latter aspect can be observed by the exertion the illiterate has to make to hold his attention to the specific task before him. Several teachers told of their use of reading material that was directly tied to the problems their students had to solve; such materials as newspaper ads, catalogues, automobile driver examinations, job applications, etc. The reality of these reading tasks was clearly evident to the learners.

Learning to read can be more successfully achieved if there is sufficient ego strength. This is such a significant point that it should be clearly understood as seen from the point of view of the magic attributes of words and the problems of symbolism. First, if words have magic attributes, that is, words can be used to achieve power over things, then it is not unreasonable that these words may come to have power over the user. Therefore, the safe thing to do is to have nothing to do with them. Secondly, if words are seen to represent forbidden or dangerous thoughts, then it would be to the individual's safe welfare not to learn the visual images of words. Once he has learned to recognize them, what is to protect him? Both these phenomena work in mutual accord against learning to read. An individual who approaches visual words from these two positions clearly indicates an insufficient ego strength to take on the task of learning to read.

In summary, I have tried to establish that words are seen to have magic attributes. The less education an individual has the greater is the probability that this attitude towards words is stronger and more pervasive in his behavior patterns involving words. These socio-cultural patterns are associated with psychological symbolism. Words and even letters take on meanings which are perceived by the individual as being so threatening to his welfare that he inhibits all ego adoption mechanisms and therefore is unable to "learn" to read. As the individual succeeds and as the socio-cultural environment acts to encourage him, he is able to build sufficient ego strength to face the demands of learning to read.

It was in order to begin to test these assertions and the findings of other investigators that the present pilot study was proposed. The first step appears to be the testing of illiterates and literates in their abilities in handling non-linguistic symbols. It was argued that if there was a progression from symbols which could be perceived as representing very directly the "real" world to those symbols which could not be perceived as having any tie to the "real" world, there would be an increasing differentiation between the illiterate and literate and in favor of the literate. That is, initially there would be no significant difference between the two groups in dealing with direct representation but the literate would achieve better scores on later tasks employing non-representative symbols.

The rationale for this hypothesis can be stated simply. The more immediate the symbol is to life, vis-a-vis, stylized drawings, the less possibility that they are vested with magic and/or symbolism. The more removed the symbol from a representation of a real object, the greater is the possibility that such symbols are vested with magic and/or symbolism.

III
THE DESIGN

The subjects were 30 adults who lived in a rural county of Tennessee. Fifteen subjects were illiterate and fifteen were literate. The two samples were matched on age, sex, geographical location and, as far as was possible, the occupation of each pair were similar. Most of the subjects were field workers or housewives. All were very poor. They came from large families and all had attended segregated rural schools. All the subjects were Negro. The schools all of these subjects had attended were one-room schools. They were the type that is common to many Southern rural communities. They were badly in need of repair, heated by a pot-bellied stove centered in the middle of the one large room of the school. All eight grades were taught in the one room. The teachers were generally not adequately prepared and were given few and inadequate supplies.

Most of the subjects were still living in the communities where they had gone to school. None of the subjects had moved into the county; that is, all had been born and grew up in this county where they were now living.

The person who administered the instruments was well known to the subjects. She had worked among these people the previous summer and part of the regular school year teaching and helping them to become registered voters. Reports from other sources indicate that she was well accepted and had a good rapport with these people.

The instruments were administered to the subjects in groups of two or three people. The format had been developed and tested out previously in Milwaukee at the Economic Opportunity Center. Simplified answer forms had been developed as the machine-scoring forms appeared to provide unnecessary difficulties. After a brief and standardized introduction each of three sets of instruments were given, one directly following the other. Since each was timed, all subjects began the instruments at the same time.

In most cases the community church was used. These buildings were centrally located and were perceived as a meeting house. Other groups met in homes at times when the house was quiet. The data were collected over a 3-week period.

There were three tests administered in this experiment. The first test was the test of space relations. This is published by the Psychological Corporation and is one of three tests which appear in a test booklet identified as Differential Aptitude Tests. Form L was employed for this study. The test is composed of patterns and these patterns appear as flat drawings of boxes of different shapes. For each pattern there are five pictures, indicating the type of box that would be constructed were this flat drawing constructed. The subject is to identify the correct box, that is, the one which corresponds to the pattern. The pictures of the boxes can be associated very readily with the world around us. The reason for selecting this particular test was to see if individuals could handle symbols which were not far removed from the world around them.

The second test was a coordination test and two parts of this were administered to the subjects. The coordination test is published by the Science Research Associates, Incorporated and is one of a battery of tests. It is composed of circles and the subject is requested to place his pencil at the outside edge of the circling channels and to follow the channel until he reaches the inside or target center of the circles. He should not remove his pencil from the page and should not touch the sides of the channels. The test is scored by indicating the number of times the subject was unable to keep in the channel, that is, the times that he touched the boundaries of the channels. This test was administered to determine whether these subjects could maintain a high degree of attention to the task.

The third instrument was the Culture Fair Intelligence test. This test is published by

the Institute for Personality and Ability Testing. The test was developed by Raymond Cattell. There are no words used in any of the subsections of the test, only figure symbols. These symbols are abstract and do not relate to any cultural or sign symbols. There were two purposes for employing this instrument. One purpose was to get a measure of intelligence on each of the subjects. The other purpose was to test the ability of the subjects to handle abstract symbols in relational logic. That is to say, this instrument was employed to test the ability of these subjects in being able to establish relationships among symbols that had no visible link with "real" things and that were used in patterns of meaningful logical relationships.

IV
RESULTS AND DISCUSSION

The data from the Space Relations instrument were treated statistically to test whether there was a significant difference between the two samples (Van Dalen, 1966). A significant level of at least .05 was required for rejection of the hypothesis of no difference. The results of the t test are reported in Table 1. The t ratio fell beyond the .05, and accordingly the results did not support the conclusion that the two samples were different. A closer examination of the raw data, as reported in Table 2, would appear to provide further evidence that a difference between the two populations did not exist on the Space Relations test data. A tentative conclusion that may be held at this time is that the types of literates and illiterates studied in this pilot investigation can handle symbols that are visually tied to the perceivable "real" world equally well.

The second instrument was the Coordination Test which was administered to determine whether there was a difference in the attention span between the two populations. The instrument was administered twice in tandem. A significant level of at least .05 was required for rejection of the hypothesis of no difference. The results of the t test are reported in Table 3. The results appear to indicate that attention does decrease for the illiterate population over time. The literate subjects not only completed significantly more of the task than the illiterate subjects but also increased the amount they completed from the first to the second trial as compared to the illiterate subjects. The mistakes of the literate subjects also increased (5.8) but not as much as the mistakes of the illiterate subjects (7.3). There were generally greater spreads between the means on the second trial than on the first trial.

The raw data reported in Tables 4 and 5 clearly show that the increase in mistakes made, although somewhat spread among the age groups, was in the main the function of the older subjects. This may be expected. However, the older illiterates increased far more (12.8) than the older literates (16). The results would seem to strongly suggest that older illiterate subjects have a good deal of difficulty with attending to pencil-and-paper tasks. Since these people have been able to make their way in the work-a-day world, one may raise the question whether the problem centers around tasks which do not relate directly to the "real" world. Further

Table 1

t Test Results for Matched Literate and Illiterate Samples* on Space Relations Instrument

Variable	Literate Mean Score	Illiterate Mean Score	df	t ratio	t (.05)
Items Attempted	33.3	34.7	14	- .3857	1.76
Items Correct	11.9	9.3	14	+1.5432	1.76

*There were 15 subjects in each sample.

Table 2

Frequency Scores for Items Attempted and Correct
on the Space Relations Test of Paired Literate and Illiterate Subjects

LITERATE				ILLITERATE			
Age	Attempted	Correct	Per cent	Age	Attempted	Correct	Per cent
18	52	16	30.8	19	35	11	31.4
20	43	21	48.8	20	56	7	12.5
37	30	16	53.3	37	58	17	29.3
Mean	41.7	17.7	42.4	Mean	49.7	11.7	23.5
44	60	17	28.3	45	25	7	28.0
44	12	4	33.3	48	19	4	21.1
46	14	10	71.4	45	25	7	28.0
45	35	19	54.3	45	46	10	21.7
44	46	12	26.1	44	38	10	26.3
49	17	6	35.3	45	29	8	27.6
49	35	16	45.7	44	14	8	57.1
Mean	32.3	12.0	38.4	Mean	28.0	7.7	27.6
56	23	4	17.4	61	21	4	19.0
58	55	14	25.5	59	44	13	29.5
63	25	8	32.0	62	22	8	36.4
56	7	2	28.6	59	43	16	37.2
56	45	13	28.9	56	45	9	20.0
Mean	31.0	8.2	26.5	Mean	35.0	10.0	28.6
Total	499	178		Total	520	139	
Mean	33.3	11.9	35.7	Mean	34.7	9.3	26.7

Table 3

t Test Results for Matched Literate and Illiterate
Samples* on Two Administrations of the Coordination Test

	Literate Mean Score	Illiterate Mean Score	df	t ratio	t (.05)
First Administ.					
Completed	7.3	6.9	14	.5784	1.76
Mistakes	15	18.1	14	- .8748	-1.76
Second Administ.					
Completed	9.1	7.9	14	1.8091	1.76
Mistakes	20.8	25.4	14	- .9125	-1.76

*There were 15 subjects in each sample.

Table 4

Frequency Scores for Items Completed, Mistakes on Items, and Ratios on the First Coordination Test of Paired Literate and Illiterate Subjects

LITERATE					ILLITERATE				
Age	Completed	Mistakes	Ratio Completed	Ratio M/C	Age	Completed	Mistakes	Ratio Completed	Ratio M/C
18	7	15	.7	2.1	19	8	25	.8	3.1
20	10	32	1.0	3.2	20	7	22	.7	3.1
37	4	7	.4	1.8	37	9	20	.9	2.2
Mean	7	18	.7	2.6	Mean	8	22.3	.8	2.8
44	10	9	1.0	.9	45	6	36	.6	6.0
44	5	4	.5	.8	48	4	19	.4	4.8
46	7	11	.7	1.6	45	5	16	.5	3.2
45	7	15	.7	2.1	45	5	15	.5	3.0
44	10	10	1.0	1.0	44	10	6	1.0	.6
49	5	7	.5	1.4	45	8	18	.8	2.3
49	10	22	1.0	2.2	44	5	6	.5	1.2
Mean	7.7	11.1	.8	1.4	Mean	6.1	16.6	.6	2.7
56	8	18	.8	2.3	61	9	36	.9	4.0
58	6	12	.6	2.0	59	7	12	.7	1.7
63	6	20	.6	3.3	62	4	13	.4	3.3
56	4	3	.4	.8	59	6	13	.6	2.2
56	10	40	1.0	4.0	56	10	15	1.0	1.5
Mean	6.8	18.6	.7	2.7	Mean	7.2	17.8	.7	2.5
Total	109	225			Total	103	272		
Mean	7.3	15	.7	2.1	Mean	6.9	18.1	.7	2.6

investigations will have to be made before an answer can be given to this question.

Table 6 presents the proportions of items completed and the ratios of mistakes over correct work for the two trials for both samples. A score of 1.0 for items completed means that the individual completed all test items. The smaller the proportion, the fewer items that were completed. The ratio of mistakes over correct work is read in the following manner: where there were an equal number of mistakes and correct work, the score is 1.0: where there were more mistakes than correct work, the score is larger than 1.0; and where there were fewer mistakes than correct work, the score is smaller than 1.0.

A quick visual examination of the table reveals a larger number of literate individuals completing the task than illiterate individuals. The illiterate subjects also have larger ratios in mistakes over correct work, thus indicating less accurate work.

The results may be interpreted to possibly indicate an inability of the illiterates to use pencils as easily as the literates who may have had more experience in using pencils. This may be correct, although from the accounts of the lives of these people, they do very little writing. Another possible interpretation is that the pencil-and-paper task may produce more anxiety for the illiterate than the literate and thus result in a poorer performance. The examiner reported that she was not aware of such anxiety. It may have been present but not readily observable. Still another interpretation may be that the illiterates

Table 5

Frequency Scores for Items Completed, Mistakes on Items, and Ratios on the Second Coordination Test of Paired Literate and Illiterate Subjects

LITERATE					ILLITERATE				
Age	Completed	Mistakes	Ratio Completed	Ratio M/C	Age	Completed	Mistakes	Ratio Completed	Ratio M/C
18	9	18	.9	2.0	19	10	41	1.0	4.1
20	10	43	1.0	4.3	20	9	18	.9	2.0
37	8	9	.8	1.1	37	10	22	1.0	2.2
Mean	9	23.3	.9	2.6	Mean	9.7	27	1.0	2.8
44	10	9	1.0	.9	45	6	39	.6	6.5
44	8	3	.8	.4	48	5	40	.5	8.0
46	10	19	1.0	1.9	45	7	16	.7	2.3
45	10	25	1.0	2.5	45	7	21	.7	3.0
44	10	40	1.0	4.0	44	10	9	1.0	.9
49	6	24	.6	4.0	45	10	18	1.0	1.8
49	10	21	1.0	2.1	44	4	4	.4	1.0
Mean	9.1	20.1	.9	2.2	Mean	7	27	.7	3.0
56	10	19	1.0	1.9	61	8	33	.8	4.1
58	9	15	.9	1.7	59	9	21	.9	2.3
63	8	16	.8	2.0	62	8	37	.8	4.6
56	9	8	.9	.9	59	6	16	.6	2.7
56	10	43	1.0	4.3	56	10	46	1.0	4.6
Mean	9.2	20.2	.9	2.2	Mean	8.2	30.6	.8	3.7
Total		312			Total	119	381		
Mean	9.1	20.8	.9	2.3	Mean	7.9	25.4	.8	3.2

were less motivated. This was extremely difficult to determine accurately. The field worker stated that she believed all the subjects tried their best and all were most cooperative. Finally, it may be argued that these illiterates were cooperative, did want to do their best, consciously tried hard but for several interrelated psychological problems were unable to pay sufficient attention to the task to do it correctly. The core of these psychological problems was the blockage these illiterates have in using symbols to stand for the real world.

The present findings do not support such a conclusion but the findings clearly indicate that such an investigation should be made. This was the central objective of the present pilot study. Before a great deal of time and expense were given to a study of the magic and symbolism aspects of illiteracy, it was argued that such a pilot study as this should be undertaken. If the results were negative, then the project should be seriously questioned. If the results were in the general direction expected from the theory then it would appear that further studies should be undertaken. The findings resulting from the administration of the third instrument may provide further enlightenment on this question.

The third instrument was the Culture Free Intelligence Test. Table 7 reports the raw scores, the general sample percentile ranks, and the I.Q. scores of the individuals in the two samples. To test for a significant difference between means, the t test was employed. The results are reported in Table 8. The data

Table 6

Difference on Ratio Scores for the Two Coordination Tests of the Paired Literate and Illiterate Subjects

LITERATE							ILLITERATE						
Age	Ratio Completed		Difference	Ratio M/C		Difference	Age	Ratio Completed		Difference	Ratio M/C		Difference
	Test 1	Test 2		Test 1	Test 2			Test 1	Test 2		Test 1	Test 2	
18	.7	.9	.2	2.1	2.0	.1	19	.8	1.0	.2	3.1	4.1	-1.0
20	1.0	1.0	0	3.2	4.3	-1.1	20	.7	.9	.2	3.1	2.0	1.1
37	.4	.8	.4	1.8	1.1	.7	37	.9	1.0	.1	2.2	2.2	0
Mean	.7	.9	.2	2.6	2.6	0	Mean	.8	1.0	.2	2.8	2.8	0
44	1.0	1.0	0	.9	.9	0	45	.6	.6	0	6.0	6.5	- .5
44	.5	.8	.3	.8	.4	.4	48	.4	.5	.1	4.8	8.0	-3.2
46	.7	1.0	.3	1.6	1.9	- .3	45	.5	.7	.2	3.2	2.3	.9
45	.7	1.0	.3	2.1	2.5	- .4	45	.5	.7	.2	3.0	3.0	0
44	1.0	1.0	0	1.0	4.0	-3.0	44	1.0	1.0	0	.6	.9	- .3
49	.5	.6	.1	1.4	4.0	-2.6	45	.8	1.0	.2	2.3	1.8	.5
49	1.0	1.0	0	2.2	2.1	.1	44	.5	.4	-.1	1.2	1.0	.2
Mean	.8	.9	.1	1.4	2.2	- .8	Mean	.6	.7	.1	2.7	3.0	- .3
56	.8	1.0	.2	2.3	1.9	.4	61	.9	.8	-.1	4.0	4.1	- .1
58	.6	.9	.3	2.0	1.7	.3	59	.7	.9	.2	1.7	2.3	- .6
63	.6	.8	.2	3.3	2.0	1.3	62	.4	.8	.4	3.3	4.6	-1.3
56	.4	.9	.5	.8	.9	- .1	59	.6	.6	0	2.2	2.7	- .5
56	1.0	1.0	0	4.0	4.3	- .3	56	1.0	1.0	0	1.5	4.6	-3.1
Mean	.7	.9	.2	2.7	2.2	.5	Mean	.7	.8	.1	2.5	3.7	-1.2
Mean	.7	.9	.2	2.1	2.3	- .2	Mean	.7	.8	.1	2.6	3.2	- .6

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Table 7

Frequency Scores and I.Q. Scores Based on General Population Norms for the Test of "g" (Culture Fair) or Paired Literate and Illiterate Subjects

LITERATE				ILLITERATE			
Age	Score	General Population Percentile	I.Q.	Age	Score	General Population Percentile	I.Q.
18	12	4	65	19	6	< 1	< 50
20	18	18	80	20	5	< 1	< 50
37	7	1	50	37	6	< 1	< 50
Mean	12.3			Mean	5.7		
44	7	1	50	45	3	< 1	< 50
44	9	1	56	48	2	< 1	< 50
46	3	< 1	< 50	45	6	< 1	< 50
45	5	< 1	< 50	45	5	< 1	< 50
44	5	< 1	< 50	44	6	< 1	< 50
49	4	< 1	< 50	45	3	< 1	< 50
49	6	< 1	< 50	44	5	< 1	< 50
Mean	5.6			Mean	4.3		
56	9	1	56	61	7	1	50
58	4	< 1	< 50	59	5	< 1	< 50
63	10	2	59	62	3	< 1	< 50
56	2	< 1	< 50	59	2	< 1	< 50
56	3	< 1	< 50	56	3	< 1	< 50
Mean	5.6			Mean	4.0		
Total	104			Total	67		
Mean	6.9			Mean	4.5		

Table 8

t Test Results on Raw Scores and Attempted Answers Between Literate and Illiterate Samples* on the Culture Free Intelligence Test

Variable	Literate Mean	Illiterate Mean	df	t ratio	t (.05)
Raw Score	6.9	4.5	14	2.2803	1.76
Attempted Answers	22.7	17.4	14	2.4926	1.76

*There were 15 subjects in each sample.

of attempted and correct answers, and the ratio of correct over attempted, are reported in Table 9. To test for a significant difference between means on attempted answers between the two samples, the t test was employed. The results are included in Table 8.

From the results it would appear that the illiterates were less intelligent than the literate. An examination of the I.Q. scores would raise serious questions about the results for both populations. The scores indicate that the majority of the subjects were morons but such was not the case. The I.Q. scores will be disregarded in favor of a closer examination of the raw scores and the ratio between the correct over the attempted answers.

The literates attempted more and got more items correct than the illiterates. A sizeable difference between the young age groups can be readily seen from the inspection of the raw data. This may indicate that the three literate subjects composing the younger subgroup are more intelligent than the other subjects. It may also indicate that they have more training in being able to handle symbols and do pencil-and-paper tasks. The literate subjects, however, as a whole did better than the illiterate subjects.

It may be that the illiterates as a group are unable to handle logic of the type given in this instrument. This will have to be tested. But it may be that the logic expressed through

Table 9

Frequency Scores for Items Attempted and Correct, and Ratio Scores on the Test of "g" (Culture Fair) of Paired Literate and Illiterate Subjects

LITERATE				ILLITERATE			
Age	Attempted	Correct	Ratio C/A	Age	Attempted	Correct	Ratio C/A
18	38	12	.32	19	26	6	.23
20	39	18	.46	20	24	5	.21
37	24	7	.30	37	19	6	.32
Mean	33.7	12.3	.37	Mean	23	5.7	.25
44	28	7	.25	45	8	3	.38
44	17	9	.53	48	11	2	.18
46	20	3	.15	45	16	6	.38
45	22	5	.23	45	14	5	.36
44	19	5	.26	44	27	6	.22
49	16	4	.25	45	12	3	.25
49	25	6	.24	44	16	5	.31
Mean	21	5.6	.27	Mean	14.9	4.3	.29
56	21	9	.43	61	18	7	.39
58	24	4	.17	59	11	5	.45
63	20	10	.50	62	17	3	.18
56	7	2	.29	59	18	2	.11
56	21	3	.14	56	24	3	.13
Mean	18.6	5.6	.30	Mean	17.6	4.0	.23
Total	341	104		Total	261	67	
Mean	22.7	6.9	.30	Mean	17.4	4.5	.26

symbols may be the problem. That is to say, the symbols may in themselves present problems for these people. There is some support for this argument. It will be recalled that there was no significant difference between the two populations on the Space Relations test. Both the Space Relations test and the Culture Free Intelligence test required forms of relational thinking. One essential difference between the two instruments was the form of symbols that were employed. The Space Relations test used items which were visually related to "real" things, vis-a-vis, boxes. The Intelligence test used very abstract symbols.

Certainly, there are other attributes of the one instrument which were not similar to the other instrument. These attributes and characteristics must be carefully differentiated and defined.

The findings by no means allow us to conclude that the thesis of this pilot study has in any way been clearly supported. The investigation has not led to rejection of the basic premises of the thesis and that is one of its major contributions. Had our expectations not been obtained in the results of the study, then the thesis would have indeed been highly questioned.

The investigator expected no differences between the illiterates and literates on tasks which employed symbols that were visually tied to the "real" world. This was found. The investigator expected illiterates to have a shorter attention span on pencil-and-paper tasks. This was also found. As the symbols became more removed from the "real" world, illiterates were expected to experience more difficulties in handling these abstract symbols. This was also found.

These results do not by themselves give sufficient grounds upon which to defend the myth and symbolism premise of the thesis. The results do indicate that these premises should be investigated further. The nature of a pilot study is to explore the feasibility of more intensive and expensive investigations. The present pilot study indicates that such further studies are warranted.

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