VERBAL EXPRESSIVENESS AS A FUNCTION OF PSYCHOLOGICAL DIFFERENTIATION

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CURRICULUM STUDIORUM

Clement C. Nwigwe was born in June 1932, in Owerri Division of the East Central State of Nigeria. He received his Bachelor of Arts degree from London University, England in June 1960.

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INTRODUCTION

The study of psychological differentiation as a research problem was begun by Witkin and his colleagues as a result of observations they made almost two decades ago in the course of their study of individual differences in spatial orientation. They have now collected a large amount of data relating field-dependence and field-independence to a number of personality characteristics. The data encouraged them to reformulate the field-dependence-independence construct in favour of a more embracing hypothesis of psychological differentiation, the framework of which they borrowed from Werner's orthogenic principles of differentiation.

Witkin and his colleagues concluded that a person's perceptual style reflects his degree of psychological differentiation. Hence the score which a subject obtains in a specific perceptual task is taken to determine the extent to which he is differentiated, as well as reflect his personality characteristics.

Witkin's study, therefore, which started with the investigation of individual differences in perceptual acitivity, eventually developed into a study of broad differences among people "in what seemed to add up to a style of life."

The common denominator underlying individual differences in performances in all the tasks used by Witkin to determine who is field-dependent and who is field-independent is the extent to which a person is able to deal with a part of a field separately from the field as a whole, or the extent to which he is able to find a simple figure within a larger complex design. This is what Witkin refers to as "analytic ability."

Field-independent subjects are said to have more analytic ability because they can deal with part of a field separately from the field itself, as a whole, while field-dependent subjects are said to be global, because of their inability to treat a part separately from the whole.

From the characteristics attributed to individuals with different perceptual styles--for example, field-independent subjects are said to be self centred and socially-withdrawn, while field-dependent subjects enjoy contact with people--it appears that certain verbal skills may be related to psychological differentiation. Verbal expressiveness, which Witkin describes as "the ability to elaborate verbally, to give extended verbal accounts" may be related to psychological differentiation in view of the social characteristics of the two perceptual groups of individuals. This is the area of concern of the present

study.

In pursuing the present study therefore, the following outline has been adopted. The first chapter which deals with the review of the literature is divided into four sections. The first section presents the concept of perceptual differentiation, the tests and personality correlates. The psychological differentiation hypothesis is discussed in the second section. Criticisms of Witkin's differentiation hypothesis follow in the third section. The fourth section deals with psychological differentiation and verbal skills. The research problem is then presented.

The second chapter is devoted to the research design. The description of the measuring instruments is presented in the first section. The experimental subjects are introduced in the second section. The procedure and statistical techniques for analyzing the data are discussed in the third and fourth sections respectively.

The third chapter contains the presentation of the results, discussion and summary.

CHAPTER I

REVIEW OF THE LITERATURE

This chapter is presented in four sections. In the first section, the concept of perceptual differentiation is discussed. In the second section, Witkin's differentiation hypothesis is summarized, followed by criticisms of his hypothesis in the third section. The relation of psychological differentiation to verbal skills is discussed in the fourth section. The statement of the research problem is then made.

1. Perceptual Differentiation Concept

Perceptual differentiation deals with how a person orients himself in space, that is, whether he perceives the upright in space, primarily through his posture or by environmental cues in the surrounding perceptual field. The study of perceptual differentiation originally begun by Witkin[1] and his colleagues eventually led to the formulation of the psychological differentiation hypothesis. During the course of their study, two decades ago, Witkin and his associates observed that people

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[1] H.A. Witkin, H.B. Lewis, M. Hertzman, K. Machover, P.B. Meissner and S. Wapner, Personality through Perception, New York, Harper, 1954.

differed in the way they oriented themselves in space and that their way of orientation was consistent and stable. As their investigation progressed, with new results emerging, they were able to conclude that -

> The way in which each person orients himself in space is an expression of a more general preferred mode of perceiving, which, in turn, is linked to a broad and varied array of personal characteristics involving a great many areas of psychological functioning.[2]

The way each person orients himself in space is reflected in his performance on any of the perceptual tests such as the Rod and Frame Test (RFT),[3] the Tilting-room Tilting-chair Test (TRTC),[4] the Embedded Figures Test (EFT).[5]

The Rod and Frame Test (RFT): The instrument for this test consists of a luminous square frame which surrounds a movable luminous rod, pivoted at the same centre as the frame. Both rod and frame can be tilted clockwise or counter-clockwise, together or separately. The chair on

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[2]H.A. Witkin, R.B. Dyk, H.F. Faterson, D.R. Goodenough and S.A. Karp, Psychological Differentiation, Studies in Development, New York, John Wiley and Sons, 1962, p. 1.

[3]H.A. Witkin et al, Op.cit. (1962), p. 36-37.

[4]H.A. Witkin et al, Op.cit. (1962), p. 37-39.

[5]H.A. Witkin et al, Op.cit. (1962), p. 39-40.

which the subject sits is movable and the test is carried out in a completely darkened room.

Three series of eight trials each make up the standard administration of the test. At the beginning of the test, the subject is seated on the movable chair and is asked to close his eyes. The rod and frame remain in tilted positions. On opening his eyes, his task is to instruct the examiner to adjust the rod to the true upright. In the first series the subject and the frame are tilted to the same side as the rod, and at other times to the opposite side. In the second series, the subject's chair and the frame are tilted to opposite sides. In the third and final series, the subject sits in an upright position, while the frame and rod are tilted, sometimes to the same side, at other times to opposite directions.

In order to perceive the rod as upright, some subjects tip it far towards the angle of tilt of the frame "thus determining its position mainly in relation to the visual field that immediately surrounds it."[6] Other subjects are able to bring the rod close to the true upright, perceiving it independently of the surrounding

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[6]H.A. Witkin et al, Op.cit. (1962), p. 1-2.

field and determining whether it is upright or not with reference to the tilt of the chair. Those subjects who perceive the rod independently of the surrounding field are said to be field-independent while those who rely on the visual field are field-dependent.

The Tilting-room Tilting-chair Test (TRTC): The TRTC tests are used to evaluate a person's perception of the position of his body and of the surrounding field in relation to the upright. The apparatus consists of a box-shaped room which is suspended on a ball-bearing pivot in such a way that the room can be tilted left or right. Inside the room, there is a chair for the subject. The chair can be tilted to the right or to the left independently of the room. The subject's task is to adjust himself to the true upright or perceive the room as upright. If he tilts himself far in the direction of the tilt of the room in order to perceive himself as upright, he is considered to make his judgement in terms of his apparent relationship to the field; but, if he does not tilt himself in order to make his judgement, he is then considered to be more sensitive to his body influence.

The TRTC is administered in two parts. The room adjustment test (RAT) consists of eight trials. In the first four attempts, the room and the chair are tilted to opposite sides, and to the same side in the next four.

The subject on each trial instructs the examiner to tilt the room until he (the subject) is satisfied that the room is perceived as upright.

In the body adjustment test (BAT), six trials are made. Three of the trials are made with room and chair tilted to the same side, and the other three with room and chair tilted to opposite sides. The subject's task is to direct the experimenter to adjust the tilted chair to a position he (the subject) perceives to be upright. The subject's score is the amount of tilt of body or chair, in degrees, when the subject reports that he perceives upright.

The Embedded Figures Test (EFT): This instrument tests the ability of the subject to find a particular simple figure within a larger complex figure. The subject is first shown a simple figure. It is then removed and he must locate it in a complex design of which the simple figure is a part. While this situation does not involve space orientation, as the first two, the objective of the task is essentially the same. Here, too, the subject is presented with an item--a simple figure rather than the rod or the body--which is contained in a complex, organized field. What is at issue is the extent to which the surrounding visual framework dominates perception of an item within it. The complex design is drawn in such a

way that the simple figure seems no longer to be within it. For some subjects, the simple figure is easily traced out, while others take more time to find it. The subject's score is the time taken to locate the simple figure in the complex design.

The two orientation tests (the RFT and the TRTC) present the subject with all the main aspects of orientation towards the upright, and his score depends on the way in which he establishes the direction of an object within a visual field, as well as the direction of the field as a whole to the position of his body. They are designed to reveal the extent to which the subject in making these determinations, adheres to the axes of the visual field or resists the influence of the field through reference to the sensations of his body. Evidence gathered from the administration of these two tasks shows that subjects tend to be self-consistent in performance across the two tasks. Hence, those who perform well are said to be field-independent, while those who perform poorly are field-dependent.

The Embedded Figures Test (EFT) operates on the same principle as the RFT and the TRTC, because in each case, the ability to separate a part from a whole, or a simple figure from a complex one is involved.

The performance of individuals in these perceptual tasks has become the basis for classifying them as relatively field-dependent or field-independent, the former being those individuals who are less successful in the perceptual tasks, and the latter being those who perform well. Successful subjects are, in addition, described as analytical because they are able to perceive an item as discrete from the organized whole of which it is part. In other words, they have the ability to single out individual parts from the whole.

On the other hand, subjects who experience the item as fused within the whole, and are unable to isolate an item from its background--as the rod from the surrounding frame--are said to be field-dependent; and their perception is said to be global. They perceive the item and its surrounding fields as one fused whole.

On the basis of their studies, as well as those from other laboratories using perceptual techniques, Witkin and his colleagues found it possible "to offer a fairly comprehensive characterization of people who show a typically field-dependent orientation in the rod-and-frame test."[7] Field-dependent subjects have been found to have a poorly developed sense of identity and separateness

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[7]Witkin (1962), Ibid.

from others, to be typically dependent upon their environment, submitting passively to authority and to demands made upon them. They tend to lack awareness of their inner life, showing fear, poor impulse control and high anxiety level.[8]

Field-independent subjects, by contrast seem to cope actively with the environment, and do not look to environmental support, they display initiative and organizing ability, they want to achieve. They maintain greater self-awareness of, and control over, inner life and impulse.[9]

Studies conducted on young adults and college students revealed small but clear cut and pervasive sex differences in all groups tested, with males being found to be more field-dependent than females.[10] The differences have since been found over a large segment of life span, but not before the age eight[11] or in geriatric

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[8]H.A. Witkin et al, Op.cit. (1962), p. 3.

[9]H.A. Witkin et al, Ibid.

[10]H.A. Witkin, Op.cit. (1954), p. 153-171.

[11]D.R. Goodenough and C.J. Eagle, "A Modification of the Embedded Figures Test for Use with Young Children," Journal of Genetic Psychology, Vol. 103, First Half, 1963, p. 67-74.

groups.[12]

Sex differences have also been seen in some ethnic groups with differing social and educational backgrounds. Within each sex, those with better performances on the EFT and RFT have been known to demonstrate greater masculinity towards culturally prescribed sex roles.[13]

However, some researchers (Berry[14] and MacArthur[15]) reported no sex differences in their own studies, but other available evidence shows that sex differences do exist between males and females in perceptual activity. Analysis of sex differences suggests the conclusion that in societies where women assume a dependent role, they will have more field-dependent perceptual characteristics than the men, but in societies where women are allowed

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[12]D. Schwartz and S.A. Karp, "Field Dependence in a Geriatric Population," Perceptual and Motor Skills, Vol. 24, No. 2, 1967, p. 495-504.

[13]C.M. Vaught, "The Relationship of Role Identification and Ego Strength to Sex Differences in the Rod and Frame Test," Journal of Personality, Vol. 33, No. 2, 1965, p. 271-283.

[14]J.W. MacArthur, "Sex Differences in Field Dependence for the Eskimo," International Journal of Psychology, Vol. 2, No. 2, 1967, p. 139-140.

[15]J.W. MacArthur, "Sex Differences in Field Dependence for the Eskimo," International Journal of Psychology, Vol. 2, No. 2, 1967, p. 139-140.

independence, sex differences will disappear.

The characteristics which Witkin and his colleagues attribute to subjects with different perceptual styles, fall into several definite clusters which reflect his experiences.

> These reflect the quality of the person's experience of his surroundings, his way of perceiving and using his body, the nature of his relation to other people, and aspects of his controls and defences.[16]

The discovery of clusters of individual differences in behaviour as a result of differences in perceptual style made Witkin and his colleagues realize that they were "in fact dealing with variations among people in patterns of characteristics--that of psychological individuality." As the issue of individuality became evident, Witkin and his colleagues began to investigate into the origin of the contrasting patterns of characteristics in individuals, their development and stability over time.[17] At this point, Witkin and his colleagues directed their studies towards the formulation of the differentiation hypothesis.

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[16]H.A. Witkin, Op.cit. (1962), p. 3.

[17]H.A. Witkin, Op.cit. (1962), p. 4.

2. Psychological Differentiation Hypothesis

Witkin's earlier work with his colleagues, dealing with perceptual problems, eventually led to their formulation of the psychological differentiation hypothesis. They had observed in the course of their experiments that an individual's perceptual style "is linked to a broad and varied array of personal characteristics involving a great many areas of psychological functioning."[18] They also observed that people who had a common perceptual style resembled one another in certain personality characteristics:

> People who were grouped together on the basis of a common perceptual style resembled one another in particular aspects of how they satisfied their needs, resolved their conflicts, handled their aggressions and formed their attitudes.[19]

A major finding of Witkin and his colleagues[20] in their earlier work was that young children tend to perceive in a relatively field-dependent form. As they develop they tend to be more field-independent. The conclusion that was drawn from this was that field-dependence-independence is related to maturational

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[18] H.A. Witkin, Op.cit. (1962), p. 1.

[19] H.A. Witkin, Op.cit. (1962), p. 8.

[20] H.A. Witkin et al, 1954.

development. Considering general developmental characteristics a child is undifferentiated in many areas of human functioning, but as he grows, he begins to distinguish between objects and between persons.

In view of the parallel development of perceptual style and general personality growth, this linkage was now considered to reflect a more complex and more embracing aspect of personality functioning. It was at this point in Witkin's work that the theoretical formulation of the psychological differentiation hypothesis became evident. The extent of field-dependence-independence was now thought to indicate the extent of psychological differentiation.

The concept of psychological differentiation was not original with Witkin and his colleagues, but it served as a theoretical basis for the psychological differentiation hypothesis. The concept of differentiation has been widely used both in biology and psychology, but the one which Witkin considered suitable for their purpose was Werner's[21] orthogenic principle of differentiation. Talking about differentiation, Werner (a psychologist) had stated that -

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[21] H.A. Witkin et al, (1962), p. 9.

> . . . an increasing differentiation and refinement of mental phenomena and functions and a progressive hierarchization may be accepted as a basic principle.[22]

The three important elements in Werner's theoretical framework are development, differentiation and integration or hierarchization. Degree of differentiation is an important characteristic of the structure of any system, whether psychological, biological or social. Stated briefly, it refers to the complexity of a system's structure.[23] The development of differentiation is considered to proceed from a relatively global or undifferentiated state towards more differentiation and hierarchic integration. Werner considered internal and external aspects of differentiation both of which are dependent on development. The internal aspect refers to a person's inner structure, while the external aspect refers to his functioning.

Among the major characteristics of the functioning of a highly differentiated system is specialization. The sub-systems which are present within the general system are capable of mediating specific functions which,

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[22]H.L. Werner, Comparative Psychology of Mental Development, Follett Publishing Co., New York, Chicago, Los Angeles, p. 40-49.

[23]H.L. Werner, Ibid.

in a relatively undifferentiated state, are not possible or are performed in a more rudimentary way by the system, as a whole.[24] In relation to a person's psychological system specialization means -

> . . . a degree of separation of psychological areas, as feeling from perceiving, thinking from acting. It means as well specificity in manner of functioning within an area. Specific reactions are apt to occur in response to specific stimuli as opposed to diffuse reaction to any of a variety of stimuli.[25]

Specialization, in relation to an individual's psychological system means also the ability to experience parts of a perceptual field as discrete rather than fused with their background.

Psychological systems, like biological ones, are open, in the sense that they are in continuous communication with the environment.[26] With reference to the surrounding field -

> . . . a high level of differentiation implies clear separation of what is identified as belonging to the self and what is identified as external to the self.[27]

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[24]H.A. Witkin, Op.cit. (1962), p. 9.

[25]H.A. Witkin, Op.cit. (1962), p. 10.

[26]H.A. Witkin, Ibid.

[27]H.A. Witkin, Ibid.

Another characteristic of differentiation which appeared relevant to Witkin's studies was integration, which applies to the functional relationship among system components. In an integrated system, each component part has a specific function, which determines its relationship to other parts of the system.[28] Two aspects of integration are important--complexity of integration and effectiveness of integration. Complexity of integration is determined by its level of differentiation. More complex relationship among system components may be expected in a system with many and varied parts than in a system with few and unspecialised parts. Hence the more integrated the parts of a system are, the greater the differentiation expected from that system.

From the foregoing presentation, it is clear that in early development, differentiation is at its rudimentary stage. The contrast between childhood and adulthood shows that development determines the form which differentiation will take in an individual's psychological functioning.

Witkin and his colleagues have followed the principle of Werner's theory when they defined differentiation as -

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[28]H.A. Witkin, Ibid.

> . . . the complexity of a system's structure. A less differentiated system is in a relatively homogeneous structural state; a more differentiated system in a relative heterogeneous state.[29]

Witkin's perceptual measures, which determine whether an individual is field-dependent of field-independent also define the extent to which the individual is differentiated, because the relatively undifferentiated person would tend to be field-dependent; while the more differentiated person would tend to be field-independent. In other words, an individual who is more differentiated relies less on the external environment, as could be seen in the Rod and Frame test.

Hence Witkin and his colleagues made the following postulation -

> Progress toward differentiation would be expressed in increasing articulation (that is, analysis and structuring) of experience. Included in this is a more articulated way of experiencing the world; also included are a more clearly defined body concept, and a growing sense of separate identity, which together reflect particularly the development of self differentiation.[30]

Differentiation, for Witkin and his colleagues, became a type of "construct for conceptualizing communality in

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[29] H.A. Witkin, Op.cit. (1962), p. 9.

[30] H.A. Witkin, Op.cit. (1962), p. 15.

behaviour in several areas of psychological functioning"[31] such as the degree of articulation of experience of the world; degree of articulation of experience of self; body concept and extent of development of sense of separate identity.

A review of the results of some studies on the relation of psychological differentiation to personality characteristics revealed that in forming their attitudes on an issue, field-dependent persons are especially prone to be guided by the positions attributed to an authority figure or peer group,[32] they are selectively attentive to the human content of the environment in the use of external sources of information for self definition. They spend more time looking at the faces of those with whom they are interacting,[33] because the face is a major source of information about what others are feeling or thinking. To the extent that they look at faces more, it is not surprising that field-dependent persons also

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[31] H.A. Witkin, (1962), Ibid.

[32] D.R. Bell, "The Relationship between Reward and Punishment Avoidance Orientations and Selected Perceptual Variables," unpublished doctoral dissertation, University of Oregon, 1964.

[33] N. Konstadt and E. Foreman, "Field-dependence and External Directedness," Journal of Personality and Social Psychology, 1965, I, p. 490-493.

tend to be better at remembering faces. Their special attention to the social environment is not limited to faces of others, it is reflected also in their superiority over field-independent persons in attending to, and hence remembering, verbal messages that are more social in content.[34]

Considering their reliance on external social standards, field-dependent subjects show a significantly stronger tendency than field-independent subjects to adapt their performance on a cognitive task to that of a model viewed on TV,[35] and to be more responsive to differences in emotional content of TV[36] programs. Finally, field-dependent subjects have highly developed social skills, and have strong preference for domains that feature interpersonal relations, and in which day-to-day work requires involvement with people, for example,

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[34]M. Eagle, L. Goldberger and M. Breitman, "Field Dependence and Memory for Social versus Neutral and Relevant versus Irrelevant Incidental Stimuli," Perceptual and Motor Skills, 1969, 29, p. 903-910.

[35]T.C. Toomy, "Alteration of a Perceptual Mode Correlate through a Televised Model," Journal of Experimental Research in Personality, 1972, No. 6, p. 52-59.

[36]S.A.W. Thomas, "The Role of Cognitive Style Variables in Mediating the Influence of Aggressive Television upon Elementary School Children," doctoral dissertation, University of California, 1971, Ann Arbor, Michigan, University Microfilms, 1972, No. 72-16, p. 251.

elementary school teaching, social science teaching, salesmanship and office managing.

In their choice of majors at school, it was evident from the Study of Clar (1971)[37] that field-independent subjects take more advanced optional science and mathematics courses than field-dependent subjects. There is also evidence connecting cognitive style to choices and performance within a given domain. From Witkin's personal interview with Blatt and Quinlan it was made clear that high achieving students in psychiatric nursing were significantly more field-dependent than high achieving students in surgical nursing, who tended to be field-independent.

Summarily the degree of individual differences in spatial orientation variously referred to as field-dependence-independence, psychological differentiation or field articulation has been an area for extensive research in recent years. The concept of field-dependence arose out of the correlations noted between performance in a variety of tests such as the Rod and Frame test, the Embedded Figures test and the Body Adjustment test.

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[37] P.N. Clar, "The relation of Psychological Differentiation to Client Behaviour in Vocational Choice Counselling," doctoral dissertation, University of Michigan, 1971, Ann Arbor, Michigan University Micrafilms, 1971, No. 71-73, p. 723.

Witkin and his colleagues have postulated that the characteristic of psychological functioning underlying the relationship between performance on all these tests is the degree to which a person can separate a part from a whole, or discover a simple figure from a complex design. A large body of research has been done in which Witkin and others have shown that individual differences on perceptual tasks are related to behaviours in a wide variety of situations. Tracing the origin of the psychological differentiation construct, Witkin viewed the more differentiated individual as having progressed from a relatively unstructured state to one of greater articulation and complexity. As part of their greater articulation, field-independent subjects are said to have a sense of separateness of self, knowledge of their own needs and feelings, reliance on their own experiences for definition of their attitudes and judgments. Field-dependent subjects on the other hand, are more socially inclined and enjoy occupations that require contact with people.

3. Criticisms of Witkin's Psychological Differentiation Hypothesis

Some critics of Witkin's psychological differentiation hypothesis have observed that the hypothesis seems to have broad implications. Psychological

differentiation appears to imply that differentiation occurs in all psychological areas. In reviewing Witkin's book,[38] Gardener stated that "the term psychological differentiation seems to imply more generality than is warranted even by the notable consistencies described."[39] Gardener based his statement on the fact that several published studies indicated that certain problem solving and verbal skills which clearly require a high level of differentiation were not found to relate to Witkin's measures of differentiation.

Zimiles[40] stated that although Witkin has provided a great deal of very valuable data, the differentiation concept is limited in its usefulness.

> The differentiation concept is defined exclusively in terms of its consequences. Its vagueness and the absence of articulated theory about its antecedents restrict its generative potential and limit its usefulness as a concept.[41]

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[38] R.W. Gardener, A Review of "Psychological Differentiation, Studies of Development," by Witkin et al, in American Journal of Psychology, 1963, Vol. 76, p. 709-711.

[39] R.W. Gardener, Ibid.

[40] H.L. Zimiles, "The Problem of Individuality in Systematic Research," a Review of Witkin et al, in Merril-Palmer Quarterly of Behaviour Development, 1964, Vol. 10, p. 375-383.

[41] H.L. Zimiles, Ibid.

Postman[42] criticises Witkin for not presenting a theoretical rationale for the use of personality tests, and for not demonstrating the reliability and validity of the projective tests as instruments in the way he is using them. Gruen,[43] in his criticism, argued that in the perception-personality relationship, personality wasn't studied enough; in other words, only isolated personality traits were studied. A more complete personality analysis could be provided by more detailed interviews of the subjects and analysis of the personality tests that were used. He went on to say that Witkin's approach groups different kinds of behaviour along one continuum, hence, concealing the "possibility that the body can be used in many different ways by the same as well as different individuals in these situations."[44]

On the question of Witkin's reduction of differences in the personality-perception relationship as being due to differences in ability to overcome an

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[42]Leo Postman, a Review of "Personality through Perception" by H.A. Witkin et al, in Psychological Bulletin, 1955, Vol. 52, p. 79.

[43]A. Gruen, "A Critique and Re-evaluation of Witkin's Perception and Perceptual Personality Work," in Journal of General Psychology, 1957, Vol. 56, p. 85.

[44]A. Gruen, Ibid.

embedding context, Gruen states that ". . . using the perceptual end result as a kind of behavioural entity with a meaning all its own is invalid."[45] Explaining this further, he said that in effect what looked like perceptual performance may, for some people, have very little to do with perception. In other words, the results of the perceptual performance on the tests may be due to the interaction of many other variables than Witkin could determine.

Zigler criticized Witkin for carrying the concept of differentiation "to a point no longer tenable."[46] He felt that Witkin's thinking "was evaluated solely from the vantage point of his (Witkin's) own theoretical aspirations,"[47] hence a considerable gap was left between Witkin's aspiration and his attainment. Moreover, he (Zigler) doubted the construct validity of Witkin's perceptual tests.

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[45] A. Gruen, Ibid.

[46] E. Zigler, "Zigler Stands Firm," in Contemporary Psychology, Vol. 8, No. 11, 1963, p. 450-461.

[47] E. Zigler, Ibid.

> There is little evidence in Psychological Differentiation that the authors intended to meet the stringent demands imposed on the theoretician when he makes the decision to use construct validity.[48]

Witkin and his colleagues are, however, aware of the limitations of their hypothesis. For example, they are aware that -

> The widely recognized principle of uneven development would lead us to anticipate that in individual children, progress towards developed differentiation may be greater in some areas than others.[49]

Moreover, Witkin himself has recognized that however fruitful the differentiation hypothesis appears to be, many questions remain unanswered.

With reference to Zigler's contention that Witkin "should have abandoned the psychological differentiation hypothesis where it broke down,"[50] Hellkamp[51] assumes a more conciliatory attitude. He (Hellkamp) advises that the "abandon policy" of Zigler should not be accepted.

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[48] E. Zigler, Ibid.

[49] H.A. Witkin et al, Op.cit. (1962), p. 18.

[50] E. Zigler, Op.cit., p. 450-461.

[51] D. Hellkamp, "Extent of Psychological Differentiation among Hospitalized Male Schizophrenics Classified among The Process-Reactive and Delusional-Hallucinatory Dimension," unpublished doctoral dissertation, University of Ottawa, Ontario, 1967, p. 25-26.

> . . . since experimental research directly concerned with the problem of psychological differentiation has been rather sparse until the entrance of Witkin et al's work, it would appear that we might be throwing out the baby with the bath water if the 'abandon hypothesis' was accepted at this time. Therefore, for purposes of the present study, Witkin's measures of field-dependence are assumed to be reflecting level of psychological differentiation.[52]

Similarly, Vernon (1963)[53] directing his comment on Wallach (1962)[54] who had accused Witkin of "empire building, i.e. for exaggerating the psychological significance of his dimension or style"[55] said -

> . . . field-independence appears to partake of many other widely accepted human parameters--general intelligence or 'g', spatial ability or S-factor, creativity, middle class versus working class, masculine versus feminine, introversion versus extroversion, somato-type, etc.[56]

but added:

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[52]D. Hellkamp (1967), Ibid.

[53]P.E. Vernon, Intelligence and Cultural Environment, London: Methuen, 1969.

[54]M.A. Wallach, Commentary: "Active-Analytical versus Passive Global Cognitive Functioning," in Measurement in Personality and Cognition, S.J. Messick and R. Ross, New York: Wiley, 1962.

[55]M.A. Wallach, Ibid.

[56]P.E. Vernon, Op.cit.

> There is no reason why psychologists should not use a construct which overlaps with other constructs, provided that it constitutes a measurable, unitary factor, and leads to fruitful hypothesis.[57]

Holtzman[58] and Anastasi (1958)[59] underlined the possibility of a biasing effect in that experimenter's prior knowledge of perceptual scores may have influenced ratings of personality correlates in Witkin's research.

Woerner and Levine[60] found significant relationship between Witkin's perceptual tests and scores on the Wechsler Intelligence Scale for children. The result raised the possibility that "field-independence might be associated with superior general intelligence."[61] High correlation between perceptual measures and I.Q. tests

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[57] P.E. Vernon, Ibid.

[58] W.H. Holtzman, "Review of H.A. Witkin, H.B. Lewis et al, "Personality through Perception in American Journal of Psychology, Vol. 68, No. 3, 1955, p. 357.

[59] A. Anastasi, Differential Psychology, New York, Macmillan, 1958, p. 357.

[60] Margaret Woerner and T. Levine, "A Preliminary Study of the Relation between Perception and Thinking in Children," unpublished study, 1950, cited by Witkin et al, Op. cit. (1962), p. 59-60.

[61] Woerner and Levine, Ibid.

have also been reported by Jackson (1957)[62] and Podell and Philipps (1959).[63]

Witkin and his companions must have anticipated this relationship hence, they stated in their earlier book that -

> . . . it is likely and this is subject to experimental test that if a person has this basic ability to 'break up' a configuration, it will be manifested not only in straightforward perceptual situations, but in problem solving situations as well.[64]

Referring to the correlations between measures of field-dependence-independence and total standard intelligence test scores, Witkin says that those test scores are "carried largely by those portions of intelligence tests which require analytical functioning."[65] This conclusion was based on the studies of Goodenough and Karp (1961).[66]

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[62] I.N. Jackson, "Intellectual Ability and Mode of Perception," Journal of Consulting Psychology, Vol. 21, No. 6, 1957, p. 458.

[63] J.E. Podell and L.C. Philipps, "A Developmental Analysis of Cognition as observed in Dimensions of Rorschach and Objective Test Performance," Journal of Personality, Vol. 27, No. 4, 1959, p. 458-465.

[64] H.A. Witkin et al, Op.cit., 1962.

[65] H.A. Witkin et al, Op.cit. (1962).

[66] D.R. Goodenough and S.A. Karp, "Field-dependence and Intellectual Functioning," Journal of Abnormal and Social Psychology, 1961, 63, p. 241-246.

As would be expected, a new theory, such as Witkin's is bound to face criticisms. The acceptability of the hypothesis depends on how successfully it answers objections and criticisms. During the process of criticism, it becomes either purified or destroyed. Witkin and his colleagues have so far amassed considerable data to support their approach to the study of psychological functioning. On the basis of their studies the dimension of field-dependence-independence is assumed to reflect extent of psychological differentiation.

4. Psychological Differentiation and Certain Verbal Skills - The Problem and Research Hypotheses

The extent to which individuals show a consistent style in the many different ways in which they express themselves is a matter of interest to psychologists. Studies have been conducted in an attempt to link the style of one's expression to different personality traits. Wolff (1943),[67] for example, conducted a series of extensive researches with "such expressive aspects of personality as--phonographic records of voice, style in

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[67] W. Wolff, The Expression of Personality, New York, Harper.

telling a story."[68] He argued, as did Allport (1937),[69] that "style is the overall consistent way in which a person expresses himself."[70] Allport regards style "as the external aspect of a marked internal consistency and organization of personality."[71]

Sanford (1942)[72] analyzed the speech characteristics of two subjects and was able to build up a synthetic picture of the styles of these two individuals. He used samples of the subjects' written language for his analysis. These studies were an attempt to link a person's behaviour, his written or spoken words to some stable personality characteristics.

The relationship between mode of field approach and verbal functioning has not yet been determined expressly by any performed studies, but evidence has been accumulated in the course of Witkin's studies, which seem

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[68] W. Wolff, Ibid.

[69] G.W. Allport, Personality, a Psychological Interpretation, New York, Holt, p. 490.

[70] W. Wolff, Ibid.

[71] G.W. Allport, Ibid.

[72] F.H. Sanford, "Speech and Personality, A Comparative Case Study," Character and Personality, 10, p. 169-198.

to show that there is some relationship in certain aspects of verbal skills. Hence, in considering the relation between some aspects of verbal skill and field-dependence-independence, evidence will be drawn from the following sources: Witkin's findings, results from the studies of other researches and conclusions based on the theoretical background of the hypothesis.

The first indication came from the study of Goodenough and Karp[73] in their analytic study of the inter-correlations of perceptual ratings and WISC subtest scores on a group of children from 9.5 - 12.5 years. They found a weak non-significant correlation between perceptual indicators of differentiation and a verbal comprehension factor. The implication appeared to be that general knowledge of facts and events (information) general fund of words (vocabulary) and expressed knowledge of correct and incorrect behaviour (comprehension) are unrelated to extent of differentiation as indicated on perceptual measures.[74]

The aspect of verbal skill, called verbal expressiveness, which Witkin describes as "ability to

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[73] D.R. Goodenough and S.A. Karp, Op.cit., 1961.

[74] D.R. Goodenough and S.A. Karp, Op.cit., 1961.

give extended fluent verbal accounts"[75] was touched upon by Witkin in his broad clinical evaluation of ten-year-old boys by interviews. He conducted the interviews with the intention of eliciting attitudes and emotional reactions of the boys. In a first study, transcripts of interviews with ten-year-old boys were rated as to level of maturity adequacy. Five categories along the maturity-adequacy immaturity-inadequacy continuum were delineated. Category 1 was contrasted with Category 5. Category 1 was characterized by general immaturity, poorly developed sense of awareness of self concept, low, critical abilities, lack of expressive powers, passivity, over-dependence, relative lack of orientation as to past events and little comprehension of relationships between events.[76]

In Category 5 were boys who showed highly developed self-esteem, positive interpersonal relationships, active interests, vitality, good expressive and analytic ability, greater insight and clear general orientation.

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[75] H.A. Witkin et al (1962), p. 188-202.

[76] H.A. Witkin et al (1962), Ibid.

Using these guidelines, the ratings of a group of twenty-four boys by one psychologist yielded a significant correlation of .49 with measures of extent of differentiation. When interviews were conducted for another group of boys and the same ratings were used by another psychologist, a weak non-significant correlation of .18 with degree of differentiation was obtained. It was felt that one of the reasons for the failure of the second rating scale was "the emphasis on verbal expressiveness."[77]

In a third interview, a group of boys were rated as to "cognitive clarity," clear and organized experiencing of events and surroundings, keen self-awareness and awareness of the role and individuality of other people were emphasized as basis of a high degree of cognitive clarity. Verbal expressiveness was not included among the criteria. The cognitive ratings on this group of boys correlated significantly ($r = .77$) with extent of psychological differentiation.[78]

The impression gathered from the above mentioned analysis of interviews is that verbal expressiveness,

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[77] H.A. Witkin et al (1962), Ibid.

[78] H.A. Witkin et al (1962), Ibid.

defined as ability to give extensive verbal accounts seems to be an indicator of extent of differentiation. Witkin also considered the possibility that the overcoming of an embedding context in a perceptual task might be related to the same ability in verbal materials.[79] Tests of camouflaged or scrambled words were considered to present similar problems as the Embedded Figures tests.[80] Podell and Philipps[81] developed a word-decontextualization test made up of anagram problems requiring rearrangement of mixed up letters, so as to form a word. For one set of problems, letters were presented in random order and for the second set, the letters were presented in word form, with the hope that the meaningful rearrangement of the letters would constitute an embedding problem. But the problems proved more difficult to solve and in Witkin's opinion,[82] this type of test is unrelated to mode of field approach.

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[79] H.A. Witkin et al (1962), Ibid.

[80] H.A. Witkin et al (1962), Ibid.

[81] J.E. Podell and L.C. Philipps, "A Developmental Analysis of Cognition as observed in Dimensions of Rorschach and Objective Test Performance," Journal of Personality, Vol. 27, No. 4, 1954, p. 458-465.

[82] H.A. Witkin et al, Op.cit. (1962), p. 188-202.

Taylor[83] and Hobson,[84] in their respective studies found that women, as a group, consistently more field-dependent than men, at the same time are known to be more proficient than men in certain types of verbal skills, verbal fluency in particular. In Witkin's opinion, this evidence appears to confirm the growing conclusion that perceptual style and verbal skills follow different ways of development.

> . . . the development of verbal skills may follow a different pathway than the development of mode of field approach and other characteristics of developed differentiation.[85]

That is, a field-dependent subject, who, according to Witkin's theory is less differentiated would be expected to have more developed verbal skills than the field-independent subject, because of the social characteristics attributed to him (field-dependent).

However, as Witkin suggests and from the writings of some psychologists, a measure of relationship should

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[83]Leona E. Taylor, The Psychology of Human Differences, New York, Appleton Century Crofts, 1965, p. 243-251.

[84]J.R. Hobson, "Sex Differences in Primary Mental Abilities," in Journal of Educational Research, Vol. 41, No. 1, 1947, p. 126-132.

[85]H.A. Witkin et al, Op.cit. (1962).

be expected between extent of differentiation and verbal behaviour. Witkin based his assertion on three reasons. First, children with global field approach, i.e. the less differentiated children, have greater need for guidance and support from others. Consequently, they need verbal communication, which elicits suggestions and directions from other persons.

Secondly, children whose limited differentiation and poorly developed capacity for self direction hamper their dealing with everyday life situations may possibly substitute "talking about" in lieu of active coping with the situations; impressive conversationalists, they may talk themselves around or out of situations they cannot actually handle.

Thirdly, Witkin referred to the study of Haggard (1957)[86] who studied a number of school children of superior intelligence and academic achievement with respect to their performance in certain basic skills and personality characteristics, gathered from personal data sheets, teacher ratings, objective and projective tests. Haggard's study revealed that high achievers in spelling and language showed field-dependence characteristics.

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[86] H.A. Witkin et al, Ibid.

> Characteristics of the group of high achievers in spelling and language, identified on personality study included among others, marked passivity and dependence upon outside sources for direction.[87]

Passivity and dependence are characteristics of less differentiated or field-dependent children.[88] Haggard's results would suggest that particular proficiency in the spelling and the language of undifferentiated field-dependent children reflect a preference for obedient rote learning and application of mechanical rules in reaction to their need for external support. This study suggests some relationship between field-dependence-independence and some aspects of verbal skills.

Levy (1957)[89] found that children of over-protective mothers tended to excel in subjects requiring language skills, in comparison to their lesser attainment in Arithmetic and the natural sciences. The following reasons were advanced for the children's special development of language skills:

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[87] H.A. Witkin et al, Ibid.

[88] H.A. Witkin et al, Ibid.

[89] D.M. Levy, Maternal Over-Protection, New York, Columbia University Press, p. 356.

1. Close association with the mother and identification with her.

2. The absence of contacts with peers which might prevent the use of adult language.

Levy's basic assumption was that the children of over-protective mothers tend to be relatively more field-dependent and less differentiated. Beckey (1942)[90] and Despert (1938)[91] appear to support the idea that seclusive and self-centred children have less developed verbal skills, than those children who associate with peers.

According to Ausubel[92] -

> . . . numerous studies of 'only' children indicate their language superiority, this is attributed to the opportunities these children have for conversation with parents. Association with parents tends to make children more field-dependent.[93]

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[90]R.E. Beckey, "A Study of certain factors related to retardation of Speech," Journal of Speech Disorders, 7: p. 223-249, 1949.

[91]J.L. Despert, "Schizophrenia in Children," Psychiatric Quarterly, 12: p. 366-371, 1938.

[92]David P. Ausubel, Theory and Problems of Child Development, Grunt and Stratton, New York: London, 1958.

[93]H.A. Witkin, Op.cit. (1962).

Furthermore, from studies of psycholinguistic differences as a function of cognitive style, there is evidence that field-dependent and field-independent persons may differ in the frequency with which they use particular word categories. Skinner (1957)[94] attributed the frequent use of I, me, to egocentricity.

> The number of times a speaker emits, I, me, my and mine is sometimes taken to indicate the strength of his behaviour with respect to himself as a controlling variable--his 'egocentricity' or 'conceit'.[95]

It might be concluded from Skinner's statement that the use of the pronoun may be an index of the individual's social orientation, in which case, a field-dependent individual is likely to employ the pronouns we, us, ours, more often, while a field-independent one uses I, me, etc. It must be remembered that some field-independent people are strikingly isolated individuals, cold and distant, and unaware of their social values, and as such, will tend to be self-centred, hence their use of I, me, etc., more frequently.

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[94] B.F. Skinner, Verbal Behaviour, New York: Appleton Century Crofts, 1957.

[95] B.F. Skinner, Op.cit., p. 27.

Fisher (1934)[96] in referring to the frequency of 'ego' references in individual's language said that such references are indicative of a subjectivistic approach to experience.

> . . . in terms of sheer frequency of ego references and use of 'I', there seems to be little question that he has a subjectivistic approach to experience. It is hardly surprising that his own activities are central in his psychological field, that he makes little reference to the experience of others and that he fails to distinguish adequately between his own impressions and the objective properties of the situation.[97]

A field-independent subject is the one who is socially withdrawn, and consequently his approach to experiences in life may be subjective.

More recently, Jennings (1967)[98] found that field-dependent persons make more self references in their speech. In her study to investigate stylistic dimension within and between the areas of cognition-perception and language, 50 female subjects from introductory psychology courses in the University of

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[96]M.S. Fisher, "Language Patterns of Pre-School Children," Child Development Monograph No. 15, 1934.

[97]M.S. Fisher, Ibid.

[98]B.S. Jennings, Some Cognitive Control Variables and Psycholinguistic Dimensions, unpublished doctoral dissertation, University of Florida, 1967.

Florida wrote about two projected pictures on to a screen. These two language samples were analysed as to number of words, verb/adjective quotient, allness terms, prepositions and conjunctions, pronouns and self references.

Each of the stylistic patterns was expressed as a percentage of the total number of words to the nearest whole number. Field-dependent subjects were found to use more self references but less verb/adjective quotients. Her study revealed that field-dependence-independence was consistently related to two psycholinguistic variables namely verbal productivity and self references. Doob (1968)[99] related the use of certain grammatical category to various personality characteristics.

> The frequency with which a person employs a certain grammatical category such as nouns, verbs, adjectives and the like has been shown to be related to various personality characteristics.[100]

Findings such as these suggest that in the way they are likely to talk about their experiences, field-dependent and field-independent persons are different.

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[99] L.W. Doob, Behaviour and Grammatical Style, in Journal of Abnormal and Social Psychology, Vol. 56, 1958, p. 348-400.

[100] L.W. Doob, Ibid.

After discussing the quantity of words used by different individuals, it might be useful to examine the quality of their words. This leads one to adjectives, more specifically adjective/noun quotient. The field-independent individual may employ more adjectives as a means of giving his experiences of the world separate identities because he has the characteristic to separate the perceived object from its surroundings.

Chotlos (1944)[101] stated that greater adjective/noun proportion characterizes I.Q. and high differentiation.

> In general, it may be said that in terms of the language measures employed, the higher the I.Q. and the higher the age level, the more highly differentiated is the language structure of the writers, . . . the use of a proportionately greater number of nouns and adjectives characterizes I.Q. and older age groups, while the use of a proportionately greater number of verbs characterizes the low I.Q. and young age group.[102]

Chotlos' findings in relation to I.Q. and age groups, may, by inference apply to field-dependent and field-independent groups as well.

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[101] John W. Chotlos, "A Statistical and Comparative Analysis of Individual Written Language Samples," in Psychological Monographs, 1944, 56, Whole No. 255, p. 77-111.

[102] John W. Chotlos, Ibid.

In summary, Witkin and his colleagues started with the investigation into individual differences in perceptual orientation, and eventually reformulated the hypothesis in favour of the more embracing concept of psychological differentiation. From their own researches and those of others in the same field, differences among individuals with different modes of perception have been established in a good number of personality characteristics. The mode of perception is determined by a person's performance in the perceptual tasks. Those who perform consistently well are designated field-independents, while those who perform poorly are field-dependents.

It has been established that field-independents are strikingly isolated, cold and distant, and are unaware of their social stimulus value. They also manifest a more general capacity to keep things apart in experience, and have a distinct sense of self.

On the other hand, field-dependent individuals are likely to change their views on particular social issues, are prone to be guided by the position attributed to an authority figure or peer group, and are attentive to human content of the environment.

Attempts have been made to establish differences in the verbal activity of field-dependent-independent subjects, especially in the area of verbal skills, as

was suggested by Witkin. Earlier studies in this connection resulted in weak non-significant relationship between some aspects of verbal skills and field-dependence but as more investigations were carried out, evidence began to mount to confirm the relationship.

Aspects of verbal expressiveness which appear to be related to field-dependence-independence include verbal productivity and length of sentences, use of self references and adjective/noun quotient. These are the areas of concern of the present study. Relying on previous studies and on the strength of foregoing arguments, it is hypothesized that -

> Field-dependent people are verbally more productive and write longer sentences, have a smaller adjective/noun quotient and make fewer self references than field-independent people.

CHAPTER II

EXPERIMENTAL DESIGN

This chapter is devoted to the experimental design. The measuring instruments are described in the first section. The second section deals with the experimental subjects. The procedure is outlined in the third section, and is followed by the statistical techniques for analyzing the results in the fourth section.

1. Measuring Instruments

(a) Thurstone's Closure Flexibility Test

Thurstone's Closure Flexibility Test,[1] more commonly known as Thurstone's Concealed Figures Test[2] was used to measure field-dependence-independence. Closure Flexibility Test has been shown to be a valid and reliable measure of field-dependence-independence and has the advantage of being easier to administer than the tests developed by Witkin. The present form of the test is a revision of several research investigations carried out by Thurstone and his

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[1] L.L. Thurstone, A Factorial Study of Perception, Chicago III, University of Chicago Press, 1944, p. vi-158.

[2] "The Sixth Mental Measurements Year Book," Oscar Buros (ed.), The Gryphon Press, Highland Park, New Jersey, 1965, p. 849-850.

associates.[3] One of the perceptual tests included in Thurstone's battery was the set of concealed figures which Gottschaldt used in studying the effects of experience on perception. The underlying principle in this test is the "ability to hold a configuration in mind despite distraction."[4]

It is a brief test, done within ten minutes. Each item consists of a simple geometric figure followed by four complex ones. The subject places a check mark under the complex figure if it contains the simple one, and a zero if it doesn't. His final score is the number of correct answers minus the number of wrong answers.

The manual contains reliability data based on the research studies of Thurstone himself. Thurstone reported a split half coefficient of .78[5] on an earlier form, while Pemberton reported a corrected split half coefficient of .94 on the present form.[6]

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[3]Oscar Buros (ed.), Ibid.

[4]Oscar Buros (ed.), Ibid.

[5]Oscar Buros (ed.), Ibid.

[6]Oscar Buros (ed.), Ibid.

The summary of factor analytic studies by Thurstone and others,[7,8,9,10] indicate that -

> CFT is related to mechanical aptitude and certain kinds of reasoning, and that subjects who score high on this test are more likely than those who score low to describe themselves on paper and pencil tests as socially retiring, not dependent on social conventions, having theoretical interests and having a drive for achievement.[11]

Thurstone himself said that the test differentiates campus leaders from other students, and more successful public administrators from less successful ones.

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[7]Harold M. Corter, "Factor Analysis of Dome Reasoning Tests," Psychological Monographs, 66(8): 1-31, 1952.

[8]Oakley Gordon, Richard Brayer, Ronald Tikofsky, "Personality Variables and the Perception of Embedded Figures," Perceptual and Motor Skills, 1961, 12: p. 195-202.

[9]C. Pemberton, "A Study of the Speech and Flexibility of Closure Factors," unpublished Ph.D. dissertation, University of Chicago, 1951.

[10]Rogers Elliott, "Interrelationships among Measures of Field-dependence, Ability and Personality Traits," Journal of Abnormal and Social Psychology, Vol. 63, No. 1, 1961, p. 27-36.

[11]Oscar Buros (ed.), Op.cit., p. 849-850.

Rogers Elliott[12] found significant interrelationships between the Rod and Frame Test, the Embedded Figures Test and Thurstone's Closure Flexibility Test. The RFT and EFT had correlation of 0.42 (N = 128), while the EFT and CFT had 0.55 (N = 128).[13] However, Witkin and his associates acclaimed the relationship between the CFT and the EFT when they said that Thurstone's CFT "have been found to relate significantly to performance in the tests of our perceptual battery."[14] In another observation Witkin remarked that -

> The observation that people tend to be self consistent in the ease or difficulty with which they escape the influence of the complex pattern points to the importance of the personal factors responsible for the differences.[15]

More recent researchers[16,17,18,19,20] have confirmed the construct validity of the CFT. From the

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[12]Rogers Elliott, Op.cit., p. 27-36.

[13]Rogers Elliott, Ibid.

[14]H.A. Witkin et al, Op.cit. (1962).

[15]H.A. Witkin, Journal of Personality, 19, 1950-51, p. 1-15.

[16]Stanley A. Rudin and Ross Stagner, "Figure-ground Phenomena in the Perception of Physical and Social Stimuli," Journal of Psychology, 1958, 45, p. 213-223.

[17]J.V. Spotts and B. Mackter, "Dependency

evidence afforded by the above references, the CFT can be regarded as a reliable and valid determinant of field-dependence-independence.

(b) The Written Assignment

The extent of verbal expressiveness was measured by means of a written task which was assigned to the subjects. They were requested to participate in a research program in education. The title of the written assignment was -

> "Describe an occupation you think will be most interesting to you and why."

Another topic was added -

> "Select one of your school games and describe how it is played."

The subjects were allowed twenty minutes to write on the given topics. The second topic was added as a means of keeping the students busy, in case any of them completed writing on the first topic before the end of

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Cognitive Style/Creativity," Perceptual and Motor Skills, 1967, 24, p. 239-268.

[18]Stephen A. Karp, "Dependence and Occupational Activity in the Aged," Perceptual and Motor Skills, 1967, 24, p. 603-609.

[19]A. Bowles, "Extent of Psychological Differentiation as Related to Achievement in Science and Attitude toward Science," unpublished Master's Thesis, University of Ottawa, 1973.

[20]P. Du Preez, "Field-dependence and Temporal Comparisons," Perceptual and Motor Skills, 1967, 24, p. 467-472.

the twenty minutes period, and was not used in determining the subjects score in verbal expressiveness.

Four items were measured in order to determine each student's score in verbal expressiveness. The first item was the number of words used by the student in the written assignment. Secondly, the average number of words per sentence was found. Thirdly, the total number of self references was obtained and expressed as a percentage of the total number of words used by the student in the assignment. Fourthly, the total number of adjectives which were actually used to qualify nouns was counted and was divided by the number of nouns they qualified.

The topic for the first task was chosen because the students were not expected to reveal their historical background, health conditions, or any information they might have considered personal to themselves. It was therefore expected that they would express themselves freely in writing.

2. Subjects

The subjects for the present study were 90 students registered in Grade 11 in a High School in Ontario. They were made up of males and females between the ages of 16 and 19. Culturally and socially they had approximately the same background, since all of them came

from the same locality. All the subjects were told that they were participating in an ongoing research in education, the results of which would be very useful to their school. They were not told the nature of the research or the method of scoring their performance.

In order to avoid infringing on the students' free time and to encourage them to participate in the research, the tests were given during normal class periods, and they were supervised by their class teachers. All 90 students took part in the Closure Flexibility tests and in the written assignment.

The top 30 of the subjects who scored highest in the Closure Flexibility Test served as field-independent subjects, while the bottom 30, who scored lowest were the field-dependents. Of the 30 students in the field-independent group, 16 were males, 14 were females. Similarly in the field-dependent group, there were 16 males and 14 females.

3. Procedure

Administration of the Closure Flexibility Test

The CFT was administered to the students first. The place of the test was a large hall in the school, where the students normally did their regular school examinations. This hall was chosen in order to permit easy administration, and to make sure that the 90 students

who took part, did the test under the same conditions. One of the class-teachers supervised the examination and was assisted by three other teachers from the same school. The test was given at the beginning of a lesson period. Throughout the ten minutes that the test lasted, close supervision of testing procedures was made to insure standard administration.

At exactly 2 p.m. on the day of the test, the students were in their seats and the instructions (see Appendix I) were read to them, followed by a brief explanation of the purpose of the test, and distribution of test papers. The exact nature of the research was not explained. The test itself lasted for 10 minutes, at the end of which the answer papers were collected from the students.

Administration of the Written Assignment

The written assignment was done on a different day, at the beginning of a normal lesson period in the morning. This was done to control for element of fatigue after a full-time class lecture. A passage of instructions (see Appendix III) was first read aloud to the students, before the papers containing the topics were distributed. The students were allowed 20 minutes to write their responses to the topics. There was strict supervision, and the students were neither allowed to communicate with

one another, nor to ask questions during the period. At the end of 20 minutes, the students were told to stop writing and their papers were collected. 90 papers were collected. All the subjects wrote on the first topic and started the second one.

4. Statistical Technique for Analyzing the Results

It had been planned to analyse the data by the use of multivariate analysis of variance with four dependent variables. Prior to testing the null hypothesis, the inter-correlations of the four dependent variables were examined. Only two of the variables, namely, total number of words and average number of words per sentence showed substantial correlation, (see Correlation matrix Appendix VII). As a result of this, the original research hypothesis was broken down into three sub-hypotheses:

(a) That field-dependent subjects are verbally more productive and write longer sentences.

(b) That field-dependent subjects use smaller adjective/noun quotient than field-independent subjects.

(c) That field-dependent subjects make fewer self references than field-independent subjects.

The first hypothesis was tested in the null form using a multivariate analysis of variance with two dependent variables (total number of words and average number of words per sentence). The other two sub-hypotheses were tested

using a univariate analysis of variance, with adjective/noun quotient and self references as the respective dependent variables.

An F test for significance at .05 level was used. Since some experimenters had reported sex differences in verbal expressiveness, sex was used as a blocking variable.

CHAPTER III

PRESENTATION AND DISCUSSION OF THE RESULTS

In this chapter, the results of the Closure Flexibility Test and the written assignment for verbal expressiveness as described in the previous chapter are presented and discussed. The order of presentation is as follows:

1. Scoring of (a) The Closure Flexibility Test;
   (b) The Written Assignment.
2. Testing the hypotheses.
3. Discussion of the results.

1(a) Closure Flexibility Test

The CFT was administered and scored in accordance with the instructions in the manual (see Appendices I and II respectively). The scores on the CFT for field-dependent and field-independent subjects are shown on Appendices IV and V, column 1. The scores ranged from 12 - 128. The scores obtained by field-independent subjects ranged from 80 - 128, while those for field-dependent subjects ranged from 12 - 63. As L.L. Thurstone has not given any precise definition in terms of cut-off scores on the CFT, as to what constitutes field-dependence-independence, one must think in terms of

relative field-dependence-independence with respect to the scores obtained by the subjects under study. In the present study therefore, the difference between the cut-off points of the two extreme groups (64 - 79) can be considered large enough to separate the two different perceptual styles.

Reference to the means and standard deviations of the scores obtained by field-dependent and field-independent subjects on the CFT shows a significant difference between the two groups (see Appendix VI).

1(b) The Written Assignment

Four scores were obtained from the written assignment, scores for total number of words, scores for average number of words per sentence, scores for adjective/noun quotient and scores for self-references. The written assignment was scored independently by two examiners one of whom was the experimenter. Where differences occurred in the scores, the papers were scored again jointly by the two examiners. Before the scoring was begun, subjects' names were removed and a random number from 1 - 90 assigned to each paper. The same numbers were written on the sheets containing the subjects' names. This was done to remove the element of scorer bias which could have arisen from the fact that the CFT scores of the same subjects had earlier been collected. The scores for verbal

expressiveness were then obtained without the knowledge of which subjects were field-dependent or field-independent.

Scores for the total number of words were obtained by counting all the words used by the subject in the written exercise. Scores for average number of words per sentence were obtained by dividing the total number of words by the number of sentences which the subject wrote. Scores for adjective/noun quotient were obtained in the following manner. Adjectives which were actually used to qualify nouns were counted. Adjectives which were used as substantives were omitted. Since the score for this variable was a ratio of adjectives/nouns, and since only qualifying adjectives were counted, nouns which were unqualified were left out, while those which were qualified were counted. The number of adjectives was then divided by the number of nouns.

Scores for self references were obtained by counting personal pronouns and adjectives such as I, me, mine, my. We, us, ours, were not counted, because they have an allness reference. The number of self references was expressed as a percentage of the total number of words used by the subject in the written assignment.

After scoring the written exercise, the subjects were then grouped into field-dependents and field-

independents according to their performance on the CFT. (See Appendices IV and V, columns 2 - 5 for the scores on verbal expressiveness).

2. Testing the Hypotheses

The means and standard deviations of scores obtained by field-dependent and field-independent subjects on the four dependent variables--total number of words, average number of words per sentence, adjective/noun quotient and self references are presented in Table 1.

For testing the first hypothesis, a multivariate analysis of variance was used with psychological differentiation and sex as independent variables, and, total number of words and average number of words per sentence as the dependent variables. The results are shown in Table 2. Significant differences were found between field-dependent and field-independent subjects, with field-dependent subjects using more words and having a greater number of words per sentence (see Table 1). For sex and interaction there were no significant differences.

TABLE 1

The means and standard deviations of scores on total number of words, average number of words per sentence, adjective/noun quotient and self references for field-dependent and field-independent subjects, males and females

	FIELD-DEPENDENT SUBJECTS				FIELD-INDEPENDENT SUBJECTS			
	MALES		FEMALES		MALES		FEMALES	
Variable	Mean	S.D.	M.	S.D.	M.	S.D.	M.	S.D.
Total No. of words	145.69	55.8	132.00	55.58	99.69	46.28	116.43	49.93
Average No. of words per sentence	21.19	2.26	21.43	2.90	16.75	3.28	18.43	2.79
Adj./noun quotient	1.16	.16	1.20	.30	1.46	.22	1.45	.33
Self references	5.00	2.56	4.14	1.35	8.13	2.28	7.71	2.2

TABLE 2

The multivariate analysis of variance with psychological differentiation and sex as independent variables and total number of words and average number of words per sentence as dependent variables

Source	d.f.	SS	MS	F
Psy. Diff (A)	2	70667.92	35333.96	13.07*
Sex (B)	2	5190.6	2595.3	.96 N.S.
Interaction (AxB)	2	4163.3	2081.65	.77 N.S.
Error	55	148689.2	2703.44	

* p less than .05

$F_{2,55} = 3.2$

A post-hoc procedure to determine whether one or both of the dependent variables (total number of words and average number of words per sentence) contributed to the significant difference between the two perceptual groups was made using the Scheffe test. The confidence interval for total number of words was .66 to 61.94, and for average number of words was 1.9 to 5.7. From these results, it appears that both contributed

to the significant results since neither interval includes zero.

In testing the second hypothesis a univariate analysis of variance was used, with psychological differentiation and sex as independent variables and adjective/noun quotient as the dependent variable. The results are presented on Table 3. A significant difference was found between field-dependent and field-independent subjects in the use of qualifying adjectives. Field-independent subjects were found to use more qualifying adjectives than field-dependent subjects (see Table 1). Differences in sex and interaction were not significant.

TABLE 3

The univariate analysis of variance with psychological differentiation and sex as independent variables and adjective/noun quotient as a dependent variable

Source	d.f.	SS	MS	F
Psy. Diff (A)	1	1.13	1.13	17.6*
Sex (B)	1	.0044	.0044	.06 N.S.
Interaction (AxB)	1	.0075	.0075	.11 N.S.
Error	56	3.71	.066	

* p less than .05

$F_{1,56} = 4.00$

For the third hypothesis it was predicted that a significant difference in the number of self references made by field-dependent and field-independent subjects would exist, with field-independent subjects being rated the high users. A univariate analysis of variance table below (Table 4) shows that the prediction made in the hypothesis was supported. Field-independent subjects make more self references than field-dependent subjects (see Table 1). Sex and interaction showed no significant differences.

TABLE 4

The univariate analysis of variance with psychological differentiation and sex as independent variables and self-references as dependent variable

Source	d.f.	SS	MS	F
Psych. Diff (A)	1	64.07	64.07	12.15*
Sex (B)	1	12.63	12.63	2.39 N.S.
Interaction (AxB)	1	5.83	5.83	1.11 N.S.
Error	56	295.18	5.27	

* p less than .05

$F_{1,56} = 4.00$

3. Discussion of the Results

Looking at the results of the analysis, one sees that there exist significant differences in the four dependent variables which were studied in the present experiment, thereby lending support to the hypotheses. The result agrees with the findings of L.W. Doob[1] that field-dependent subjects have a greater rate of word productivity than field independent subjects, but disagrees with Jennings,[2] whose research results showed that field-independent subjects produce more words.

Jennings projected two pictures for five seconds each, and the subjects were asked to write on them. The amount that each subject could write on these pictures depended on many factors such as ability to comprehend quickly, imagination and degree of concentration at the moment of exposure of the pictures. It also required analytic ability, which would enable the subjects to see the parts of the pictures within the short duration of their exposure. It appears therefore that field-independent subjects saw more and consequently wrote more than their field-dependent counterparts.

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[1] L.W. Doob, Op.cit., 1968.

[2] B.S. Jennings, Op.cit., 1967.

The findings of the present study with respect to total number of words and average number of words per sentence appear consistent in view of the social characteristics attributed to individuals with field-dependent and field-independent styles of perception. The field-dependent person associates with people and enjoys occupations that require contact with other, while the field-independent person is retiring and self centred.

The prediction that field-dependent subjects use less adjectives to modify nouns was also supported by the findings. Field-dependent subjects on the average had a one-adjective-one-noun pattern while most subjects in the field-independent group, more often than not, used two adjectives for each noun they wished to qualify.

This finding is also consistent with the characteristics attributed to field-independent subjects. Adjectives are used to give separate identity to nouns, and field-independent subjects have the characteristic to give their experiences of the world separate identities. This can be done by the use of adjectives.

Considering the variable of self references there was a significant difference between the two cognitive styles. The research hypothesis was therefore supported. In Jennings' study, field-dependent subjects were found to make more self-references than field-independent subjects.

The reason for this disparity may be the nature of the written assignment given to each group of subjects studied. In Jennings' study, the subjects wrote on an object. In the present study, the subjects wrote about themselves, hence the opportunity to make self references was greater. It appears more likely however that a person who is self centred, seclusive and independent will tend to speak of himself more often than of others. The field-dependent individual who, according to the theory associates with people and is socially more developed than the field-independent individual may likely address himself as part of a group instead of as a separate individual. The findings of the present study with respect to self references seem consistent with the theory. However, further investigation into this particular problem appears necessary.

There were no significant sex or interaction differences across the four variables--total number of words, average number of words per sentence, adjective/noun quotient and self references. Males and females had the same cut-off points on their scores on the Closure Flexibility Test and this fact likely was responsible for the lack of sex differences in verbal expressiveness. The raw scores on the CFT for both males and females did not show much difference (see Appendices IV and V, column 1).

Some earlier studies--Gleser and others (1959)[3] found no sex correlates of verbal productivity.

One question that may be raised about the validity of the present study is whether the amount and nature of written work collected from the subjects were sufficient to give valid results. The topic on which the subjects wrote was a fairly common one, and afforded each of them enough opportunity to write without much thinking. It was expected that within the given time, the subjects would produce enough materials for the experiment. There is no doubt, however, that with a larger quantity and a variety of written material, more valid results would be obtained.

It is therefore suggested that a combination of written and oral materials be used, and a variety of topics be assigned to the subjects for future investigations in verbal skills. In this way, the subjects may have the opportunity to react in a manner suitable to them.

As the present experiment has found significant difference between the high and low psychologically

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[3]G.C. Gleser, L.A. Gottschalk and W. John, "The Relationship of Sex and Intelligence to Choice of Words - A normative Study of Verbal Behaviour," Journal of Clinical Psychology, 1959, 15, p. 182-191.

differentiated groups in verbal expressiveness, other aspects of verbal skills may be investigated. For example: Is there a difference between field-dependent and field independent subjects in the use of active and passive verbs? Furthermore, as field-independent subjects use fewer words than field-dependent subjects, the quality of words they use may be different. They may prefer words with specific meanings rather than words with general implications. A research is necessary before this can be confirmed.

In conclusion, the present study would suggest that verbal expressiveness as defined by total number of words, average number of words per sentence, adjective/noun quotient and self references may be related to extent of psychological differentiation, thereby lending support for Witkin's psychological differentiation hypothesis. Sex differences which were not found significant in this experiment on verbal expressiveness as a function of psychological differentiation could be further investigated.

SUMMARY AND CONCLUSION

In view of Witkin's contention that further research was required in the area of relationship between some aspects of verbal skills and psychological differentiation, the present study was undertaken to explore the possibility of this relationship. Verbal expressiveness was the aspect of verbal skills studied. Consequently the following prediction was made--that field-dependent subjects are verbally more productive than field-independent ones, write longer sentences, use less adjective/noun quotient and make less self references.

Ninety Grade 11 students (males and females) from an Ontario High School were studied with respect to the above hypothesis. They were tested with Thurstone's Closure Flexibility Test for extent of psychological differentiation and were given a written assignment to measure verbal expressiveness.

The CFT scores were ranked, with the top 30 and bottom 30 subjects being designated as the high and low differentiation groups respectively.

The research hypothesis was tested in the null form with level of significance at .05. Multivariate analysis of variance was used for total number of words and average number of words per sentence, while

univariate analysis of variance was used for adjective/noun quotient and self references, because of the lack of significant correlation between the above four variables.

Significant differences were found across the variables--total number of words, average number of words per sentence, adjective/noun quotient, and self references--between field-dependent and field-independent subjects. The significant results suggested that verbal expressiveness as defined by the verbal measures used in the present study may be related to psychological differentiation. There were no significant differences between males and females.

The results do lend some support to Witkin's psychological differentiation hypothesis, although further research is needed. Suggestions as to areas for further investigation were given.

BIBLIOGRAPHY

ALLPORT, G.W. Personality, a Psychological Interpretation, New York, Henry Holt and Co., 1941, vii-588 p.

This book gathers into a single comprehensive survey, the most important fruits of the psychological study of personality and supplies new coordinating concepts and theories for studies in psychology.

ANASTASI, A. and J.P. Foley, Jr. Differential Psychology, The Macmillan Company, New York, 1949, v-894 p.

Deals with individual and group differences in behaviour, and represents a thorough revision and considerable enlargement of the original book. The present volume has drawn more extensively upon recent findings in genetics anthropology and sociology.

BUROS, Oscar. The Sixth Mental Measurements Year Book, Oscar Buros (ed.), The Gryphon Press, Highland Park, New Jersey, 1965.

A publication in seven volumes, periodically revised and containing critical reviews of published and standardized tests. It also supplies information costs, methods of administration, reliability and validity of such tests.

GARDENER, Riley W. "Book Reviews," in American Journal of Psychology, Vol. 76, No. 4, p. 709-711.

The author takes a critical view of Witkin's adoption of the psychological differentiation hypothesis, and says that Witkin's hypothesis implies more generality than warranted by research findings. He emphasizes that certain problem solving and verbal skills requiring a high level of differentiation did not relate to Witkin's measures.

BIBLIOGRAPHY

JENNINGS, B.S. "Some Cognitive Control Variables and Psycholinguistic Dimensions," unpublished doctoral dissertation, University of Florida, 1967.

The primary purpose of this dissertation was to determine the generality of stylistic behaviour across cognitive perceptual tasks, and into the realm of linguistic behaviour. Intra-subject consistencies across different language eliciting situations were sought as evidence of stylistic behaviour. Some of the major findings of Jenning include higher verbal productivity and fewer self references in favour of field-independent subjects.

POSTMAN, Leo. "A Review of Personality through Perception by H.A. Witkin et al" in Psychological Bulletin 1955, Vol. 52.

The author took a critical view of Witkin's hypothesis, and accused Witkin of failing to demonstrate the reliability and construct validity of the perceptual tasks he used.

WITKIN, Herman A., H.B. Lewis, M. Hertzman, K. Machover, P.S. Meissner and S. Wapner. Personality through Perception, New York, Harper, 1954, xxvi-511 p.

This was the first major publication in relation to field-dependence-independence construct. In this publication Witkin and his colleagues presented the origins of the field-dependence construct and its distinctive features. They also presented results of the research projects they had carried out relating style of cognitive functioning to personality characteristics.

WITKIN, H.A., R.B. Dyk, H.F. Faterson, D.R. Goodenough and S.A. Karp. Psychological Differentiation, New York, Wiley, 1962, p. v-418.

This was the second major work by Witkin and his colleagues. Here many of the propositions in the first publication were extended and confirmed. The principle of psychological differentiation was developed and used as the framework for research in cognitive style.

ZIGLER, E. "A Measure in Search of a Theory," in Contemporary Psychology, Vol. 8, No. 4, 1963, p. 133-135.

A critical review of Witkin's Psychological Differentiation 1962. Insisted that field-independency is but an extension of general intelligence.

APPENDIX I

DIRECTIONS FOR THE ADMINISTRATION OF THE CLOSURE FLEXIBILITY (CONCEALED FIGURES) TEST (FORM 'A'), AND THE TESTS.

Developed by L.I. Thurstone, Ph.D., and T.E. Jeffrey, Ph.D., The Psychometric Laboratory, The University of North Carolina.

CLOSURE FLEXIBILITY

(Concealed Figures)

(Form A)

Please fill in:

Name _____

Age _____ Sex _____ Date _____

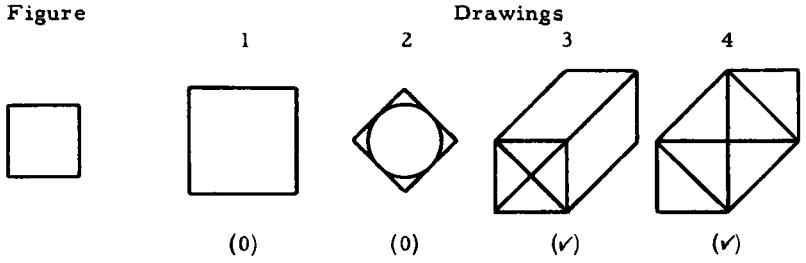
Occupation _____

_____

Developed by: L.L. Thurstone, Ph.D. and T.E. Jeffrey, Ph.D. • The Psychometric Laboratory • The University of North Carolina

Directions:

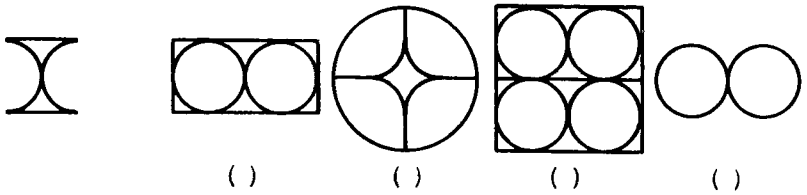
The row of designs below is a sample item of this test. The parts have been labeled to make description easier. These labels do not appear in the test items. The left hand design in each row is the figure. You are to decide whether or not the figure is concealed in each of the four drawings to the right. Put a check mark (✓) in the parentheses under a drawing, if it contains the figure. Put a zero (0) in the parentheses under a drawing, if it does not contain the figure. Look at the row of designs below.



In the row above a zero (0) has been written in the parentheses under drawing 1. The first drawing is a square but it is larger than the figure. A zero (0) has been written under drawing 2. Although the second drawing contains a square of exactly the same size as the figure, it has been turned. Check marks (✓) have been written under the third and fourth drawings since they each contain a square of exactly the same size as the figure and have not been turned. It does not matter that the figure contained in drawings three and four is on a different level from the figure at the left.

Sample:

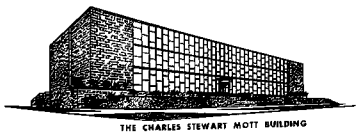
Here is another example for practice. Try it.



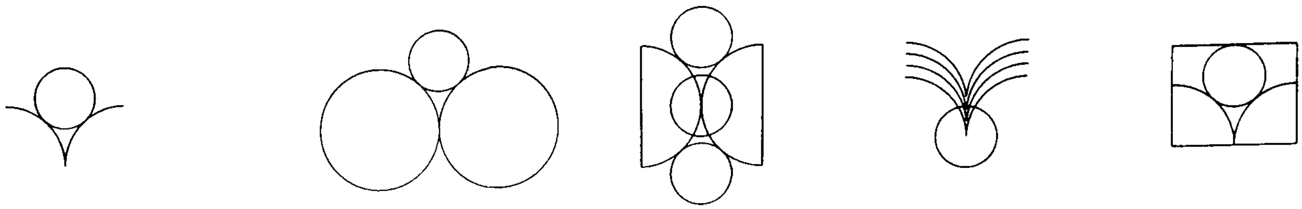
You should have placed check marks (✓) in the parentheses under the first and third drawings and zeros (0) in the parentheses under the second and fourth drawings.

WHEN YOU GET THE SIGNAL TO BEGIN, turn the page and mark more problems of the same kind. Work as fast and as accurately as you can, but do not guess. Wrong answers will count against you. You are not expected to finish in the time allowed. You will have exactly ten minutes to do as much as you can.

TMNF-119
8-3-5000



Published by Industrial Relations Center The University of Chicago
1225 East 60th Street Chicago, Illinois 60637



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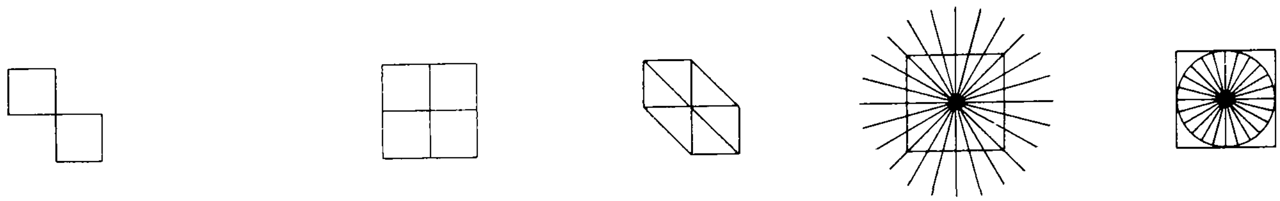

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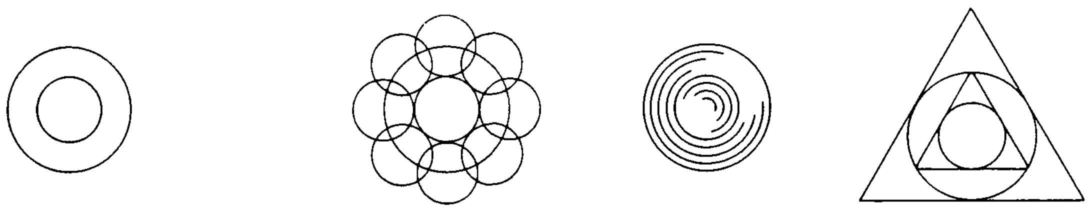

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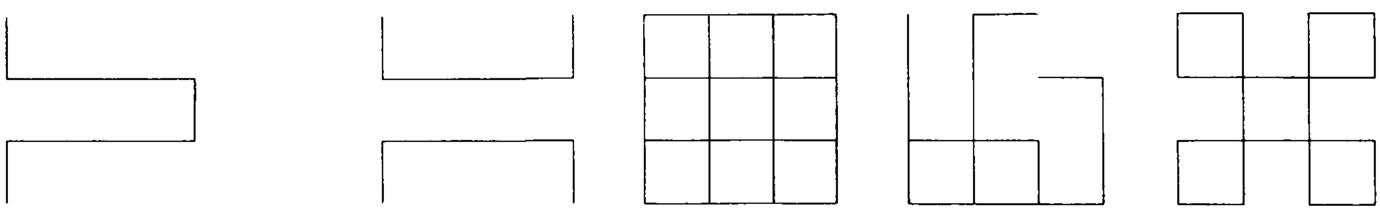

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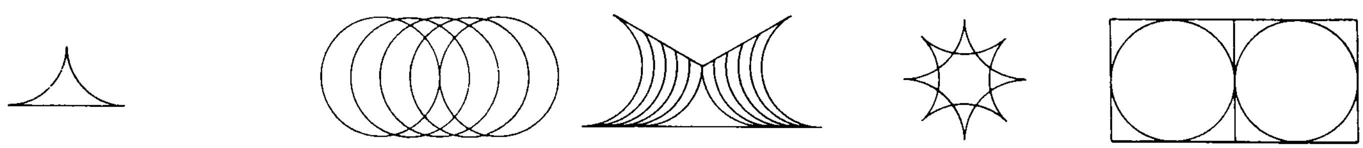

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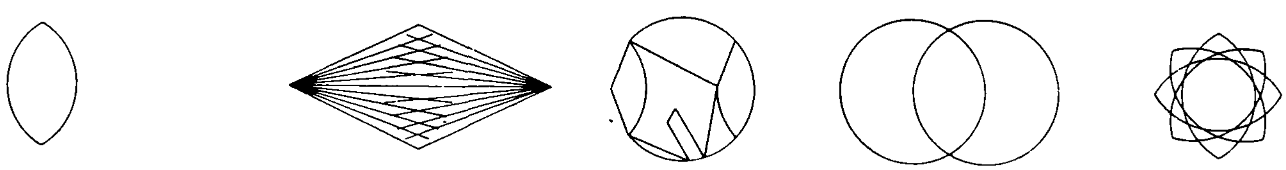

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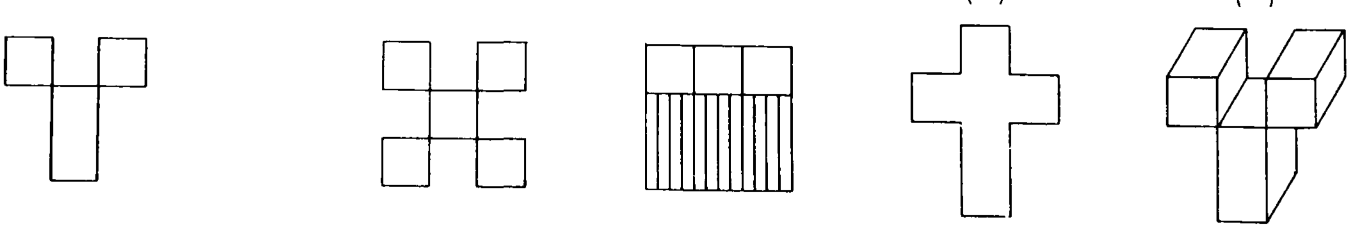

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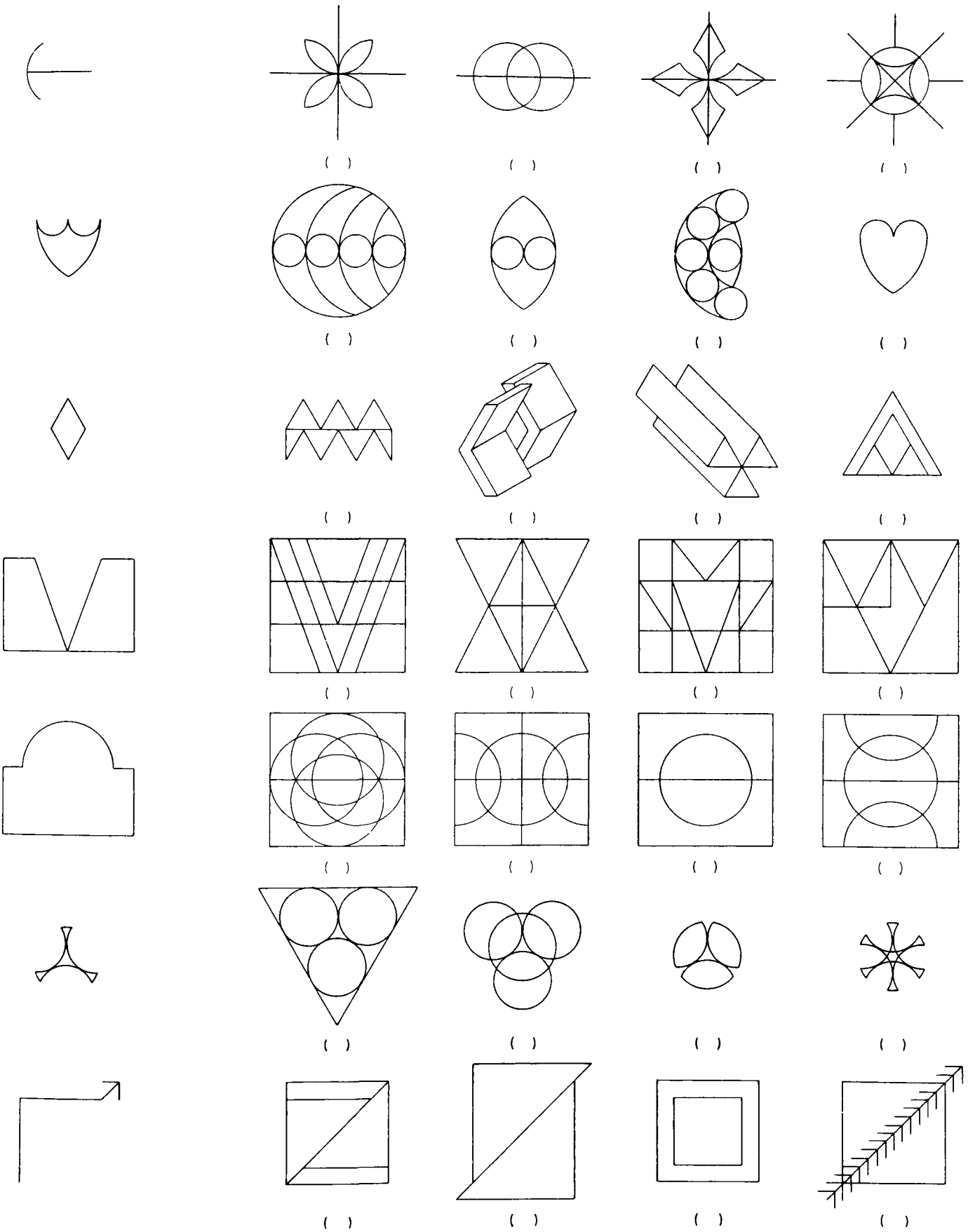

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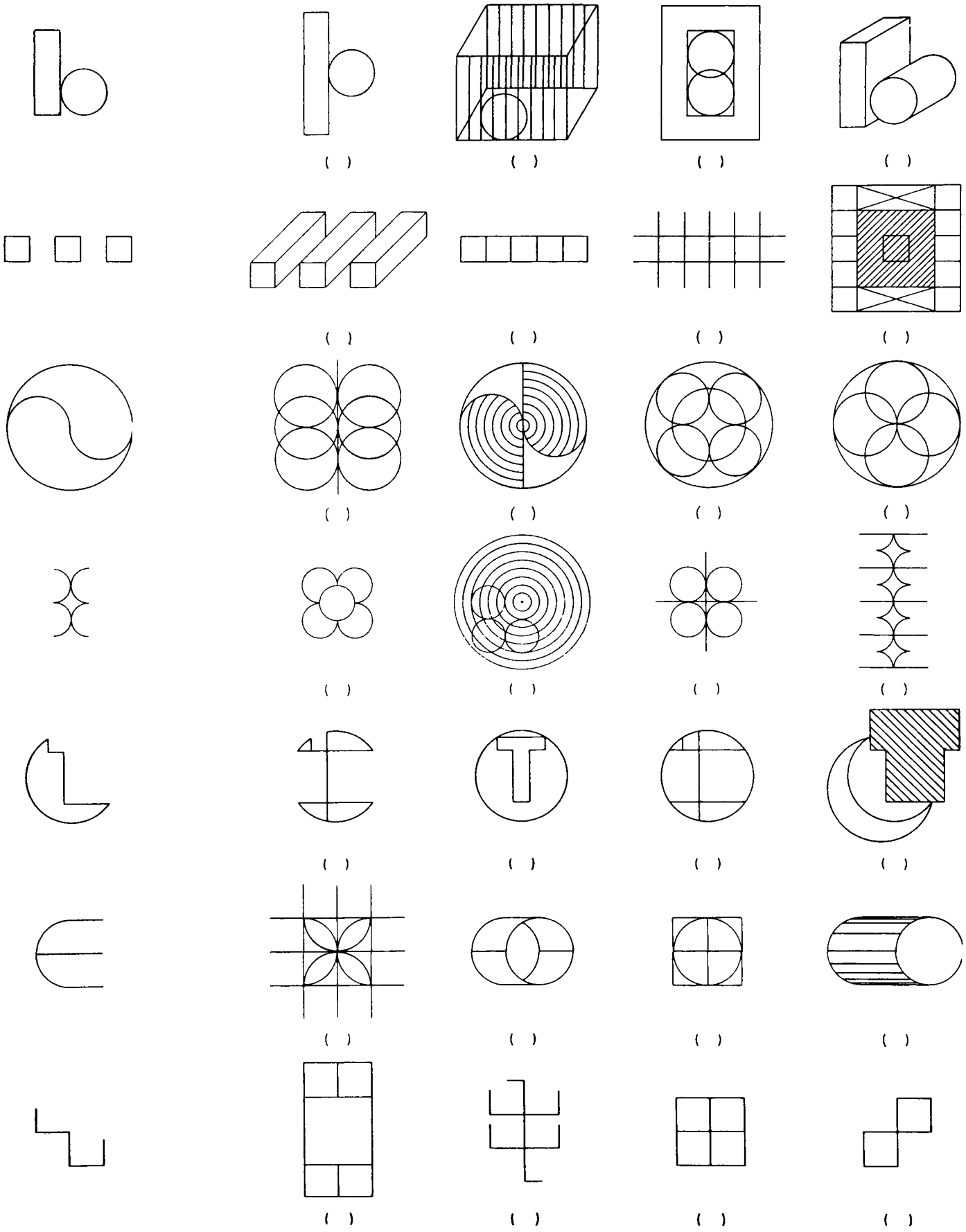

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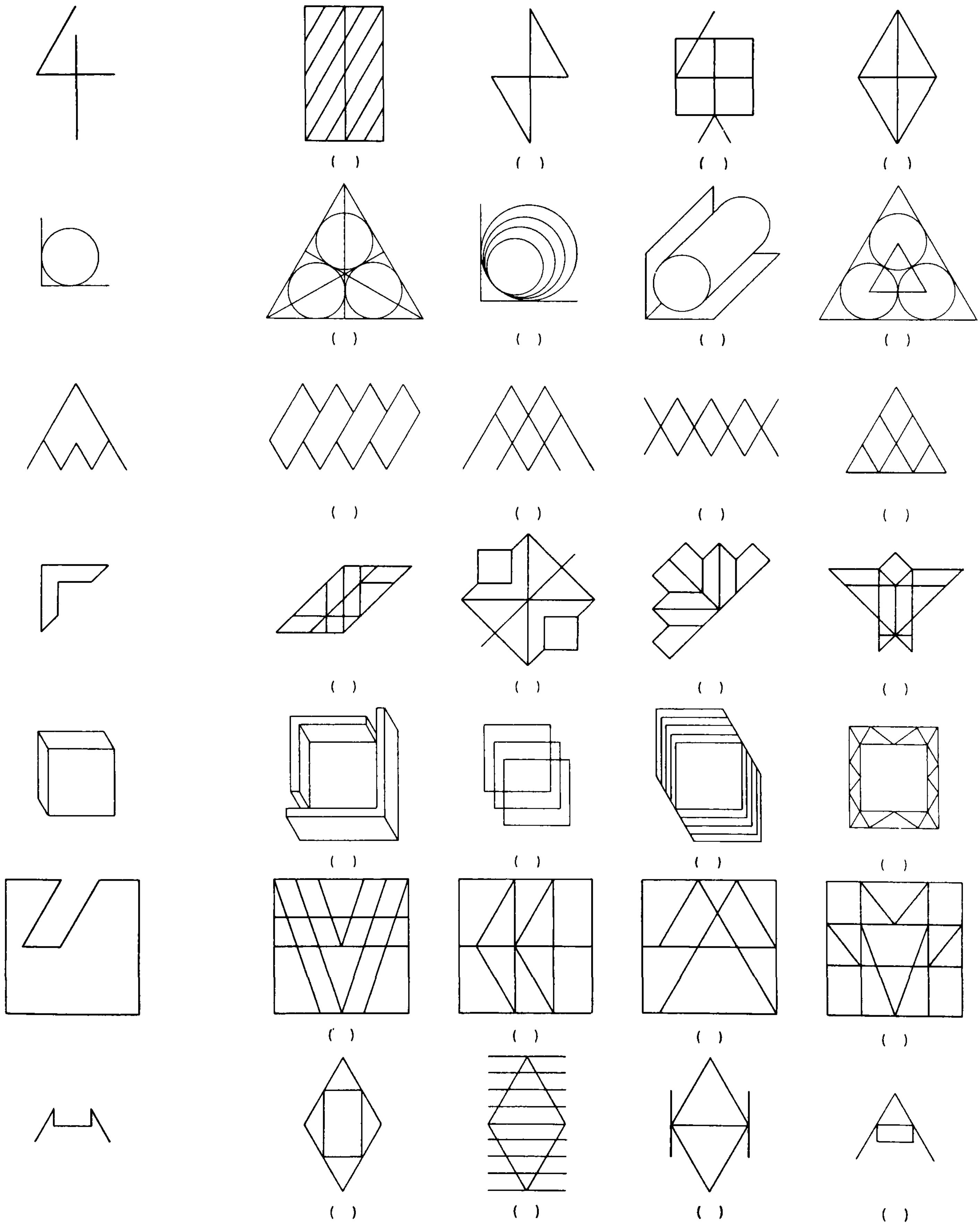

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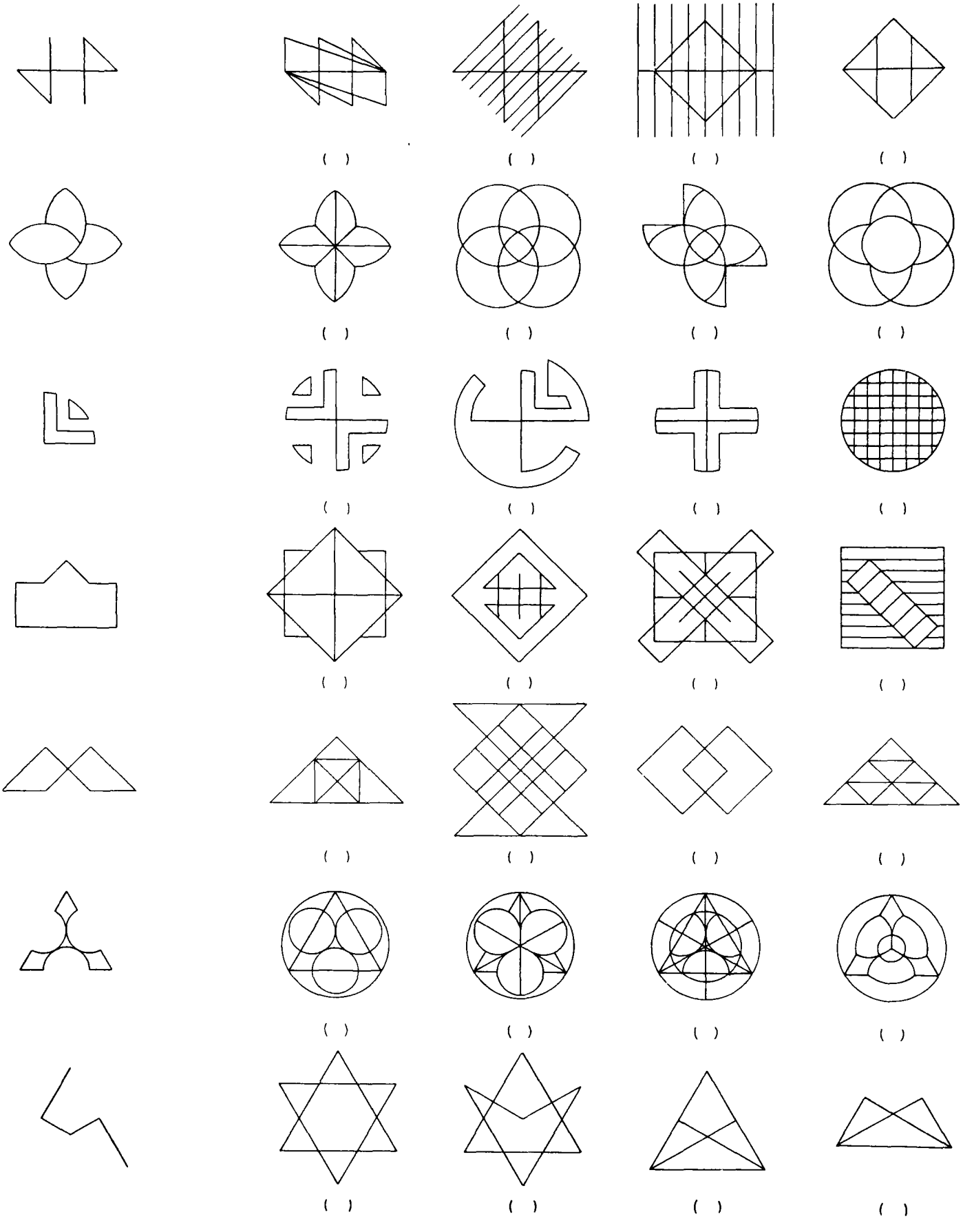

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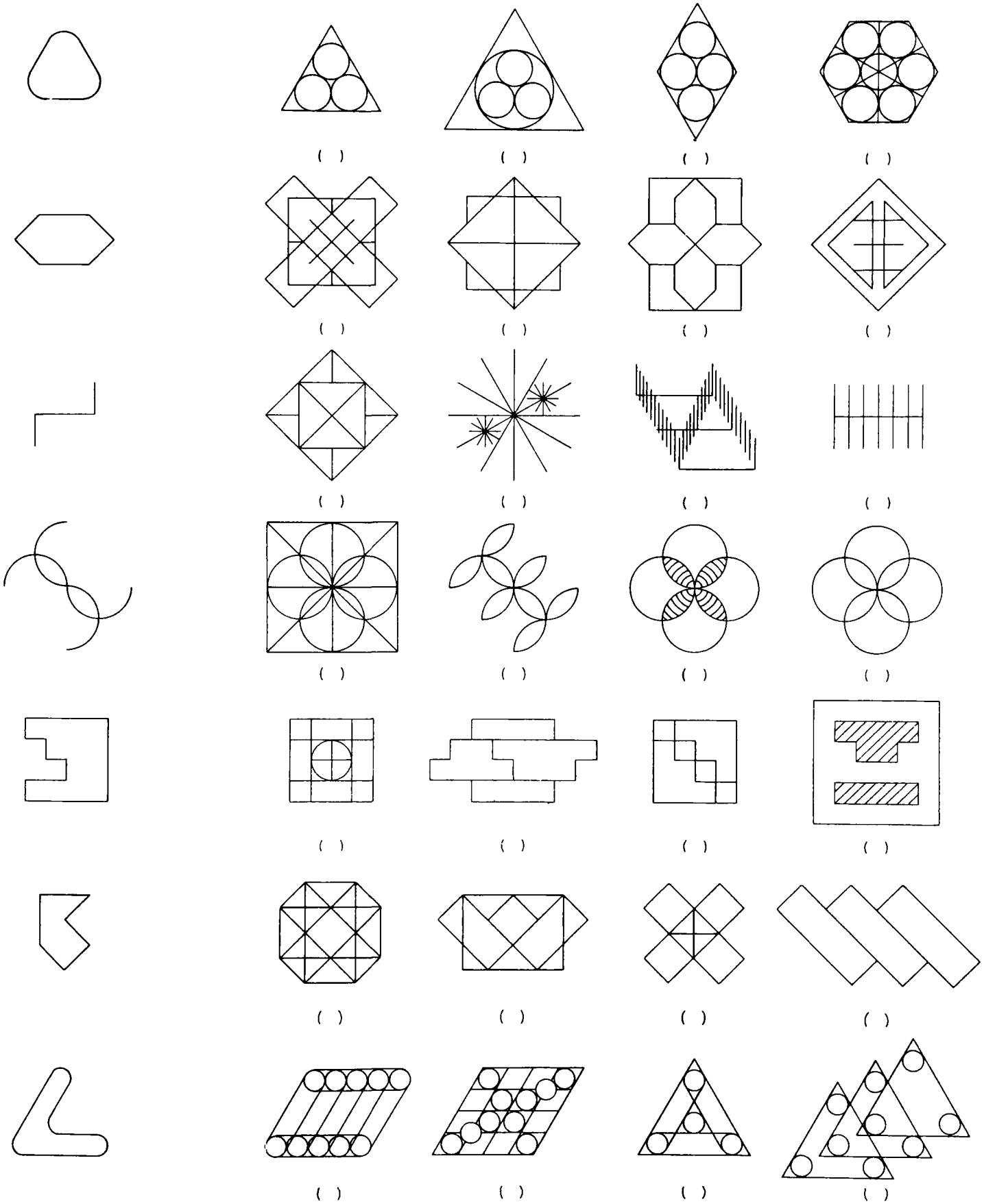

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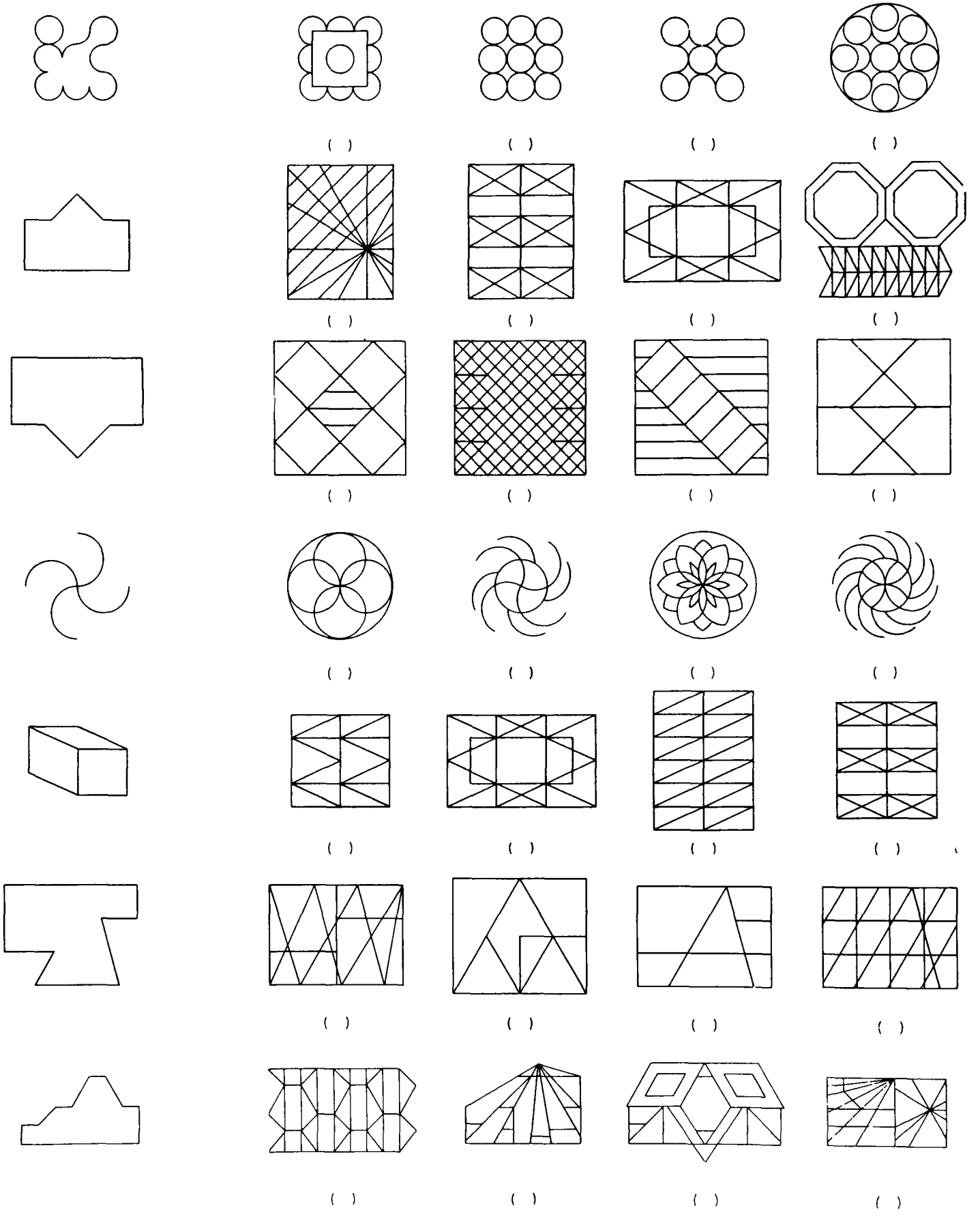


STOP HERE -- WAIT FOR FURTHER INSTRUCTIONS.

APPENDIX II

SCORING KEY CLOSURE FLEXIBILITY (CONCEALED FIGURES) (TMNF 119)

SCORING KEY

CLOSURE FLEXIBILITY

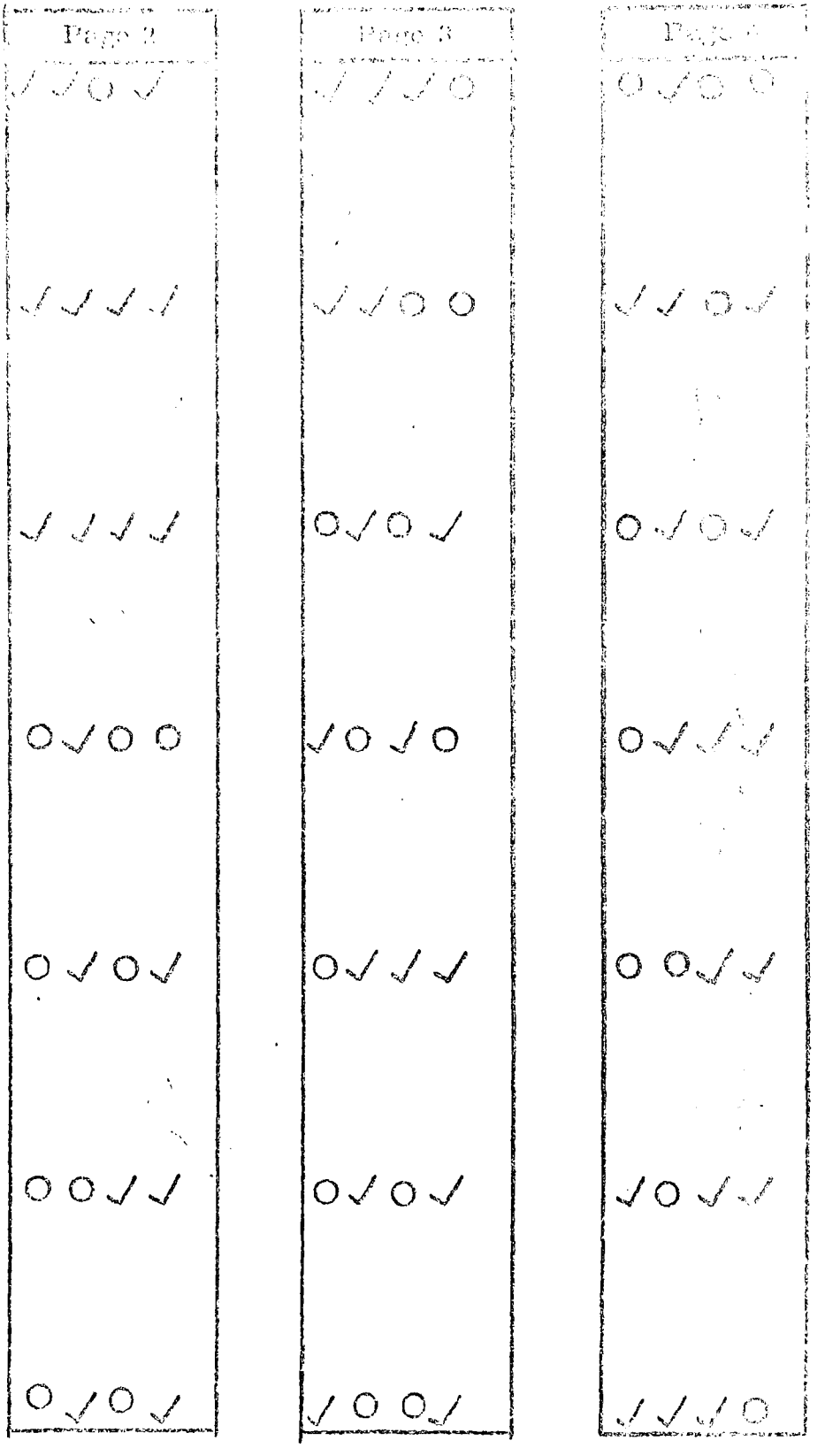
(Concealed Figures)

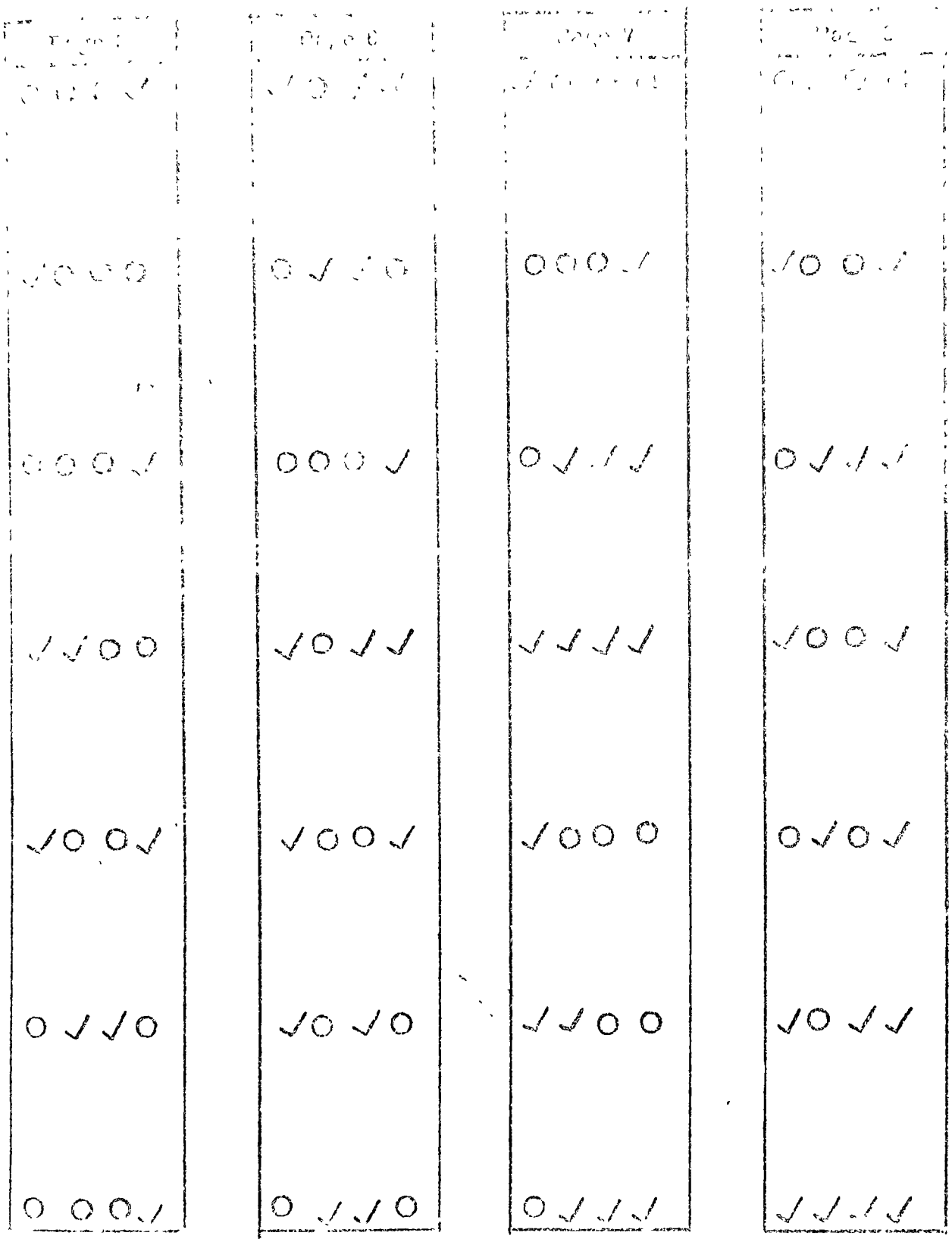
(CRMF 119)

Raw Score = Number right minus the number wrong (R - W).

(Do not include in the scoring procedure those items which have not been answered.)

See Manual (CRMF 319-R3) for Normalized Standard Score equivalents and Percentile equivalents of Raw Scores.





APPENDIX III

INSTRUCTIONS AND TOPICS FOR THE WRITTEN ASSIGNMENT

University of Ottawa, Faculty of Education
A Written Assignment for a Research Program

Directions to the Supervisor:

1. The following passage should be read aloud to the students before they start to work on the written assignment.

> "The exercise you are about to do now is part of a research program in education. You have 20 minutes to put down your responses on two topics which are very familiar to you. You can spend the 20 minutes on the first topics if you choose to do so. Start with topic No. 1, and when you have completed what you want to write on it, then go to No. 2.
>
> You have already taken the Closure Flexibility Test. Your performance in the present exercise will be compared to that of the Closure Flexibility test, and the findings will be of great interest to your school in future. Let your answers be honest and relevant to the topics.
>
> Thank you."

2. After reading the above passage aloud to the participating students, distribute the question papers. The students may use ball pens or pencils. The duration of the assignment should be exactly 20 minutes. There should be no questions when the writing is going on.

TESTING FOR A RESEARCH PROGRAM

NAME

MALE - FEMALE (circle one)

AGE

DATE

Directions:

1. Write your answers on the attached sheet. Use the reverse side of this question paper if necessary.
2. Complete no 1 before you go to no 2.
3. Spend as much of the time as you wish on no 1.
4. You have 20 minutes for this exercise.

1. Describe an occupation you think will be most interesting to you, and why.

2. Select one of your school games and describe how it is played.

APPENDIX IV

The scores on the Closure Flexibility Test and Verbal Expressiveness for the male field-dependent and field-independent subjects

FIELD-DEPENDENT MALE SUBJECTS					FIELD-INDEPENDENT MALE SUBJECTS				
CFT	Tot. No. of words	Adj/ noun	Self References	Avg. No. of words per sentence	CFT	Tot. No. of words	Adj/ noun	Self References	Avg. No. of words per sentence
1	2	3	4	5	1	2	3	4	5
12	155	1.50	5	22	128	104	1.50	10	13
16	120	1.00	8	24	120	164	1.60	10	25
32	150	1.20	4	20	115	76	1.00	7	15
46	196	1.10	6	22	114	159	1.33	8	18
50	85	1.00	4	18	105	85	1.25	6	17
52	286	1.14	7	20	99	59	1.67	8	19
53	188	1.00	2	24	92	27	1.00	7	14
58	90	1.20	3	18	89	155	1.60	8	19
59	144	1.33	1	18	88	69	1.67	4	17
62	133	1.40	10	21	85	68	1.50	6	17
62	222	1.16	4	25	82	71	1.50	10	14
62	144	1.00	5	24	82	104	1.67	4	15
63	123	1.14	2	21	81	92	1.42	5	18
63	134	1.32	4	20	80	45	1.67	9	11
63	80	1.00	9	20	80	137	1.40	6	20
63	81	1.10	6	22	80	180	1.56	6	16

APPENDIX V

The scores on the Closure Flexibility Test and Verbal Expressiveness for the female field-dependent and field-independent subjects

FIELD-DEPENDENT FEMALE SUBJECTS					FIELD-INDEPENDENT FEMALE SUBJECTS				
CFT	Total No. of words	Adj/ noun	Self Ref- erences	Avg. No. of words per sen- tence	CFT	Total No. of words	Adj/ noun	Self Ref- erences	Avg. No. of words per sen- tence
1	2	3	4	5	1	2	3	4	5
29	228	1.25	5	25	123	122	1.40	6	17
38	100	1.16	5	22	119	101	1.30	9	20
39	199	1.00	4	20	102	180	1.50	3	20
46	113	1.67	3	18	97	138	2.00	4	17
50	179	1.00	2	22	92	112	1.00	6	16
57	103	1.00	4	21	92	57	1.00	5	14
58	84	1.00	5	21	91	58	1.80	5	15
60	80	1.00	4	16	89	167	1.30	3	18
61	95	1.00	5	19	86	132	1.10	9	22
62	230	1.00	4	25	85	56	2.00	3	19
63	81	1.25	6	27	81	97	1.40	7	19
63	85	2.00	5	20	81	84	1.75	4	21
63	160	1.40	1	22	80	98	1.50	9	20
63	111	1.10	5	22	80	228	1.30	13	23

APPENDIX VI

The means and standard deviations of scores on the CFT for field-dependent and field-independent subjects

	Mean	Standard Deviation
Field-dependent	49.53	15.08
Field-independent	96.2	14.11

APPENDIX VII

Sample correlation matrix for total number of words, adjective/noun, self references and average number of words per sentence

	No. of words	Adj/noun	Self References	Avg. No. of words per sentence
Total No. of words	1.00			
Adjective/ noun	- 0.06	1.00		
Self references	- 0.012	- 0.02	1.00	
Average No. of words per sentence	0.427	- 0.0009	0.211	1.00

APPENDIX VIII

Abstract of Verbal Expressiveness as a Function of Psychological Differentiation

Evidence from Witkin's work and the social characteristics associated with field-dependent and field-independent subjects are the basis for the hypothesis that the two perceptual groups differ in verbal expressiveness

Three classes of 90 secondary school students were tested with the Concealed Figures Test to identify field-dependent and field-independent extreme groups. Verbal expressiveness was tested by means of a written assignment from which scores in the following four dependent variables were collected: total number of words, average number of words per sentence, adjective/noun quotient and number of self references.

Results of a multivariate analysis of variance supported the hypothesis that field-dependent subjects use more words and write longer sentences than field-independent subjects. Post hoc procedures showed that both variables likely contributed to the significant difference. A univariate analysis of variance showed that field-dependent subjects use less adjective/noun quotient and

make fewer self references. There were no significant differences between the sexes on verbal expressiveness.

The results lend support to Witkin's psychological differentiation theory.