AN ECLECTIC MODEL: INSTRUCTIONAL STRATEGIES FOR REPRESENTATIONAL DRAWING

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ABSTRACT

During the age range of late preadolescence and early adolescence, specifically between ages twelve to fourteen, a critical change appears to take place in many art students. In some instances their artistic skills and natural confidence appear to atrophy. They indicate a lack of awareness and aesthetic appreciation. In their representational drawings they leave much of the visual information of the stimulus objects unaccounted for and resort to stylization and stereotypes. Yet instruction of a particular type and programming appears to assist a child in making a more meaningful statement about his visual impressions. From the indications of developmental psychology, visual perception, and brain theory, it is evident that the complexity of the learning process may require a variety of teaching/learning strategies. The traditional analytic, verbal-oriented mode of instruction may not always be suited to a learner's needs. An eclectic model that is synthetic and holistic in approach and nonverbaloriented may be a more appropriate instructional strategy for representational drawing.

In a study of representational drawing where the students were exposed to learning experiences which were primarily nonverbal and synthetic and holistic in approach, their work became consistently more sophisticated and their confidence and enthusiasm appeared to have been nurtured as well. However, due to the unfortunate unequal matching of the experimental and control groups initially, it can only be speculated that this particular teaching strategy effects a larger gain than more traditional approaches to drawing instruction.

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PREFACE

Essentially this thesis evolved from several beliefs of the writer concerning education in general and art education in particular. Specifically, these beliefs are 1) children approach learning with a wide range of learning styles, 2) teachers should have access to a number of teaching strategies preferably from a variety of sources in order to accommodate as wide as possible a range of learning styles, and finally, 3) instruction is essential to certain aspects of art education in order to nurture a competence that has a marked influence on creativity.

In particular this thesis has been designed toward an instructional model for the teaching of drawing in art education.

It is an eclectic model derived from both historical and theoretical sources; in particular, from developmental processes, visual perception, brain theory, and the nature of artistic learning itself.

Though the instructional strategies developed in this model pertain directly to the improvement of representational drawing, indirectly they also pertain to the nurturant effects on such factors as selfesteem, attitudes, and motivation. This, then, is an attempt to prescribe particular instructional strategies for representational drawing.

I wish to acknowledge the assistance given to me in the preparation of this study by my thesis advisor, Professor Bette Hanrahan, my research advisor, Dr. Bernard Davis, my typist, Sue Helms, and the encouragement given to me by my family. In particular, I wish to acknowledge my motivational source, that is, my art students - especially the Grade Seven students who participated in this study.

INTRODUCTION

As an art teacher of the preadolescent-adolescent age groups, it has occurred to me that a critical change takes place in many students at some point in this age range. In some instances the child's artistic skills and his natural confidence appear to atrophy. In many instances his creative expression appears stunted or indicates a certain lack of awareness or aesthetic appreciation as he resorts to stylization and stereotypes. Though one might expect the child's artistic development to correlate at least moderately with his rate of maturation, from my own experience, this period of atrophy generally seems most obvious sometime between the ages of twelve to fourteen years. Given a choice of means of communication, or media, many children of this age appear to experience an inability to make a meaningful statement about their impressions of their encounters with the visual forms about them. On the other hand, it also appears that with particular types of learning experiences which are primarily nonverbal and which tend to enrich the visual experience, not only does the child's representational work become significantly more sophisticated, but also confidence and enthusiasm seem to reappear.

Developments in modern art education were in reaction to rigid academic traditions and evolved around philosophic considerations of the nature of the child himself, whether he

"blossomed" from with-in or required nurturing from with-out. In fact, the concept of the child, the nature of his artistic activity, and the means of developing his creative potential remain the main source of concern and investigation in present day art education, with the trend being to fit somewhere on the continuum between nature and nurture. It is my purpose to develop the position that not only does nature demand nurture, that is, free expression demands instruction, but that a particular kind and programming of instruction is needed. To this end I include a brief history of art education in order that the issue of instruction, as contrasted to free expression, be viewed in perspective. An examination of the developmental processes of Piaget, particularly as they apply to art education, allows one to hypothesize as to which stage specifically art instruction is most useful. An examination of visual learning and visual perception allows one to particularize which modes of instruction might be most relevant to artistic learning. Further, recent findings in the field of brain theory concerning the various predispositions and strategies of brain functions, motivates one to speculate as to what implications this information might have for art education.

In an attempt to illustrate that specific modes of instruction may, in fact, increase a twelve to thirteen year old's

ability to render representational drawings, a summary of related studies as well as a description of an exploratory study conducted to this end with eighty-six Grade Seven students in my classroom is included. Just as it would appear impossible to explain or predict with any certainty what effect certain factors contribute to children's art, it would be equally impossible to claim that that this experimental mode of instruction, namely visual enrichment through nonverbalized learning experience, is the sole factor responsible for any change effected in the child's ability to represent visual forms. Obviously incidental input to senses other than the visual, as well as less obvious environmental factors could not be abstracted from the experiment. Nevertheless, in an attempt to begin study of this problem and to begin to find a basis for an effective procedure, it was essential to isolate a particular sensory area, such as the visual, for experimental work. The desired outcome of this study would be the possibility of hypothesizing, indeed prescribing, that particular modes of instruction do, in fact, enhance a preadolescent's representational drawing.

HISTORICAL PERSPECTIVE

CHILD ART

The notion of 'child art' is a modern conception. Previously such a concept was not required, art being considered an adult activity, only adults being capable of mature feelings and intellectual discrimination. But modern definitions of art which describe it as a "language of symbols" with "power to communicate feelings and intuitions that would otherwise remain suppressed" clearly place child art well within the modern, accepted criterion for art. Developmental psychology, an increasing interest in primitive art, and the recognition of modern art are the factors which MacDonald sees as contributing to the recognition of child art.

The downfall of academic high art at the end of the nineteenth century, the inrush of colorful post-impressionist work shortly afterwards, made possible for the first time a comparison between child and adult art. Child art, primitive art, tribal art, western Asiatic art were no longer regarded as crude, but rather as sensitive and expressive forms of art. Sir Herbert Read rightly stated that it was a growing appreciation of primitive art and revolutionary developments in painting which helped to bring children's art within the general range of aesthetic appreciation.²

Though child art came to be acknowledged in the nineteenth century, early art education evolved with little or no "reference to the nature of child development" and was "taught by means that were derived more or less from prevailing conceptions in

Lacking the later psychological explanations of the characteristics of children's drawings, the accepted nineteenth century explanation of why children draw the way they do was a naive view, based upon the supposition that children were simply untrained and untutored in the use of proper skills and that they had not developed good habits of observation to produce drawings that exhibited correct proportions and perspective. Even the seemingly enlightened Montessori had no real understanding of the "monstrous" nature of children's "free drawing".

Free drawings are only possible when we have a free child who has been allowed to grow and perfect himself in the assimilation of his surroundings and in mechanical reproduction.⁵

Many nineteenth century views of art education made little or no reference to the nature of childhood. Art education in the public schools was closely connected to the economic concerns of industry. Thus, rather than the production of art for aesthetic purposes, many public school art curricula consisted of drawing manuals or copy books directed toward the mastery of industrial drawing or improved penmanship. Art education implied exercises for the purpose of developing visual and motor habits. The very influential American Educator, Arthur Wesley Dow, arrived at his method of art instruction from his concept of the nature

of art itself. The proponent of formal instruction, he proposed a rather standardized study of design, a method of logical synthesis. Referring to his method as a "synthetic" approach, he concluded that there are certain fundamental ideas common to all fine arts and "...that the function of instruction is to use these elements and principles to create progressively complex compositions, beginning with simple harmonies of lines."

Though Dow was in vehement opposition to the traditional academic approach, the formalism of his own approach was soon to be attacked with just as much vehemence by those who were concerned with a particular conception of children's artistic development.

By the latter part of the nineteenth century, views regarding the nature of the child began to influence art education. With the kindergarten movement, particularly with Froebel's concept of sensory learning for early childhood, the "creative impulse" in children was recognized and given encouragement. Thus the emphasis in teaching slowly began to shift from the subject to the child. Further evidence of this changing climate of opinion regarding the nature of childhood is the manual training movement which made an effort to tailor learning activities to children's abilities and interests. At this point art educators were beginning to question the previous logical and systematic approaches to art instruction.

Concurrent with these movements was another factor that

strongly influenced art education: the establishment of the first child study centre at Johns Hopkins University in the 1880's by G. Stanley Hall. There it was "...discovered that the child had an emotional life as well as a corporeal existence and thus his education depended upon expression as well as impression."

The effect of this concept was to broaden the scope of the content and to begin to shift the emphasis in art education from the product to the child. One of the key figures in art education at the turn of the century, Henry Turner Bailey, wrote:

Paidology (the science of the child) is revealing much to us. We are beginning to follow the lead of the child in education. When untrained, he has always expressed himself by means of drawing almost the first day in school. Such free expression has been disregarded or discountenanced; now it is fostered and studied, for it is the germ of artistic graphic expression, and the basis for technical instruction. 11

After World War I, the progressive movement supplanted rigorous structure with the apparent complete freedom of expression such as advocated by the Swiss, Frank Cizek, who emphasized that creative expression must come from within, that children mustn't copy nature, nor examine the work of great artists of the past. From his observations, Cizek noted that "children have their own laws which they must obey." To the progressive educators, Cizek's was the ideal approach to the teaching of art to children.

Method poisons art. . . . In his class he makes no suggestions to the children unless they ask for them. He gives no orders. What he does is give sympathy and understanding to stimulate childish imaginations. 12

It seemingly required nothing from the teacher except the direction of "taking off the lid." " . . . All one had to do was give the child complete freedom, and he would create masterpieces." As child art became an accepted facet of education trends began to manifest themselves in the shaping of that education.

NATURE OR NURTURE

Much of the early debate in modern art education was in reaction to rigid academic traditions. It evolved around the nature of the child himself and the philosophical consideration of nature or nurture, whether the child blossomed from with-in or required nurturing from with-out. Two of the most influential art educators of this century, Viktor Lowenfeld and Herbert Read, fell on the side of nature, viewing the child as an "unfolding organism whose talents come to fruition with sympathetic and unobtrusive teaching", with art being an instrument for personality integration. 2

Heavily influenced by Freudian psychoanalytic theory,

Lowenfeld clearly viewed art education in the context of the

effect which creative processes have on individuals: " . . . and

if their minds are blocked and move around in stereotypes, their

frame of reference needs to be extended . . . by meaningful

experience." To Lowenfeld, this meaningful experience was one

of the most important principles in education. In describing

creative activity, he emphasizes:

If children developed without interference from the outside world, no special stimulation for their creative work would be necessary. Every child would use his deeply rooted creative implulse without inhibition, confident in his own kind of expression.⁴

Art for the child is merely a means of expression. Since a child's thinking is different from that of adults, his expression must also be different. Out of this discrepancy between the adult's "taste" and the

way in which a child expresses himself, arises most of the difficulties and interferences in art teaching. 5

Don't impose your own image on a child. All modes of expression but the child's own are foreign to him. We should neither influence nor stimulate the child's imagination in any direction which is not appropriate to his thinking and perception. The child has his own world of experiences and expression.

Lowenfeld, then, is concerned for the creative and intellectual growth of the child with the minimum of interference, with complete freedom to proceed at his own rate in his own way, with the teacher being a passive facilitator. To him, the environment, in fact anything external to the child, was a contaminant to the child's natural creative abilities.

Drawing from Jung's view of the collective consciousness,

Herbert Read's concept of self-expression is a process which

enhances personal satisfaction and social unity. With an optimistic

view of the world, Read sees the child as already possessed of a

natural, through unconscious integration with nature, and thus

he should "be educated to become what he already is, . . . to

develop his own potentialities within the framework of a society

liberal enough to allow for an infinite variety of types." And

so education,

. . . must maintain and develop 'sensibility' and 'imagination', and it must avoid the use of intimidating and imposed kinds of instruction. The 'discipline of art' emerges from the prelogical, 'unconscious' levels of the mind in the sensuous interaction of the individual with appropriate tools and materials; the teacher must be a sensitive, patient mediator in the process.8

Thus Read proposed that art become the basis of education

and not the instrument, since exercise in the formative processes of art is, in itself, a most fundamental aspect of human development. "The aim of education is . . . the creation of artists - of people efficient in the various modes of expression." 9

By the end of World War II, such factors as relativisim, transactional psychology and Dewey's experimentalism had a serious impact on the concept of the child, and art education. Dewey explained the aesthetic experience as the result of transactions between the work of art and the viewer. Further, he suggested that each person brings his own previous experiences to the viewing of a work of art, and, as such, no two persons would perceive or derive meaning from it in the same way. For such educators as Manual Barkan, art becomes an instrument of communication. Since the child did develop independently of his environment, the teaching of art, in addition to the needs of the child must also take into account the social and cultural factors. Thus Barkan's concept of the child was that of a growing organism which developed through interaction with the nurturant environment, rather than developing from within at the exclusion of the contaminating environment as proposed by Read and Lowenfeld. 10

In summary then, the historical trend shows the gradual integration of art into general education. It is also apparent that there is some historical basis for the dichotomy of opinion that has developed around the issues of free, self-expression

and instruction, as modes of art education. Just what are the implications of these differing opinions for art education? The issues may be formulated thus: Shall we consider art an instrument or an end? Shall we educate through free, self-expression, or shall we educate through skills development by way of formal instruction? Let us examine the opinions of several contemporary art educators as they pertain to the issues of free, self-expression, and instruction.

Munroe viewed Dow's "course of plodding synthesis" as having more concern for abstract logical classification than for the necessary sequence of steps in mental growth. Though rational analyses do have a place in art education,

. . . the primary concern of the teacher should be of securing vitality and freedom for perception, emotion and imagination. . . . Intelligence can liberate and harmonize creative impulses, but it can never build out of bare logical concepts a form touched with life. 11

In Munroe's opinion Cizek's self-expression was just as impoverished.

A few years of undirected toying with art materials had been enough to exhaust its attractiveness as a game, and he (the student) had come to demand something more substantial to bite down on mentally, some intellectual food for his growing curiosity about the world. For this next step in development the free expression method had no help to offer him - nothing but the vague advice to keep on being himself and doing whatever he wanted. 12

To Munroe, the old academic method and the free-expression method are equally restrictive, because they each fail to present a sufficient variety of artistic forms and techniques.

To Rowland, neither formal study of design, nor free, self-expression provide what he considers essential to the art process - problem-solving. Formal study of basic design at the exclusion of function or problem-solving leads a student up a blind alley, leaving him unable to connect the abstract to the real, and in the main to fall back on traditional solutions. Rowland describes his interpretation of free, self-expression and deplores its tenet:

Teachers encourage their pupils to explore an idea or a number of ideas in a variety of media (including waste materials) and to express themselves freely in this activity. It is believed that children will thereby be induced to engaged their innermost emotions in practical work and in so doing, to activate their imagination, their creative and intellectual capacities, so that they may come to terms with the world. It is an accepted part of this approach that a child's work is inviolate; it is a coherent, autonomous structure that answers only to its own logic and rejects any other kinds of analysis and justification. To correct it, to impose any control on such work from outside the organism which produced it, can only lead to a freezing of all those capacities which educators have gone to great lengths to motivate. 14

Rowland, who sees the visual quality of the child's environment as one of the most powerful and effective agents in moulding the child's expressive ability, in affecting his experience, takes exception to this approach to art education, claiming "free expression in art is not the bare instinctual reaction which many believe it to be . . . [but] a compound of a number of still unknown environmental influences and imitative factors . . . [which] are already conditioned by the time he begins art classes . . .

[although] not necessarily suited to his personality." He continues his criticism of the theory of free, self-expression:

However, the theory is suspect. The nature of inspiration in art has been sadly misunderstood. Artistic freedom stipulates control. The artist begins by asking 'questions' to confirm or disprove his barely-felt hypotheses. He thus creates problems to which his work may give an answer. As he particularizes, the problems he has himself created become clearer and his working methods more conscious. It is through this interplay, within a frame of reference, between conscious and unconscious responses that the artist solves some of his problems (as he creates new ones), bridges inner experience with outer reality, and so achieves a kind of balance. All the time he is deeply motivated. A child giving free, unbridled expression to his feelings is not necessarily going through the same process. 16

From this interplay between reality and imagination that is the essence of problem solving comes internalization and heightened creativity.

Similarly, Bruner, stressing the role of conscious problem solving as a "receptacle for unconscious responses", also finds fault with the progressivist's view that unconscious responses by themselves serve educational ends. He describes such freedom as "a form of pedagogical romanticism:"

It is too often taken for granted that the processes that lead to effective cognitive functioning are mere extensions of conscious dreamwork and association. I do not believe this to be the case . . . the metaphoric processes can, when put under the constraints of conscious problem solving, serve the interests of healthy functioning. Without these constraints they result in the crippling decline that comes from a specialization on defence. 17

He blends this criticism with his own conception of child development:

I shall urge that in a major sense, growth is from the outside in, and that a conception of unassisted maturation

is scientifically untenable and, indeed, esthetically irresponsible. 18

Obviously this is in sharp contrast to Lowenfeld's or Read's notion of child development through a process of natural unfolding.

Viktor D'Amico also addresses the issue of freedom in art education:

Spontaneity and freedom are disciplines. You are not being free or not letting the child be free by saying 'do anything you like or take anything you choose.'
. . .freedom is something that may be locked inside you. Spontaneity is a reaction that only comes at its perfection - at its achievement when you are free to act as a unit, integrally. A person who is spontaneous is a person who is in command of his subject, idea, and medium. When we say we are being free because we let children do as they like, all that we are doing is giving the child responsibilities that we as teachers were created for. 19

D'Amico's notion of spontaneity is a considerable extension of Bruner's motion of "growth from the outside in." 20

One must consider that the position presented for each of the above theorists, as they address the question of free expression or instruction, is taken out of context for the purpose of developing a particular point of view. If these views were accepted with this limited meaning, it would seem that there is no real case for either free expression or instruction in these educators' terms. Such is not the case, and I believe their real position is presented, at least by implication. For instance, Rowland dencounces each approach. Then what would he propose as an acceptable approach to art education? As is the trend today, many art educators, including Rowland, are striking

a balance between these poles, not because they seek compromise, but because they have the advantage of modern psychological findings to apply to this problem. This tends to place certain attributes of each point of view in a new perspective.

We have evolved from a position of no concept of child art to a choice of extremes: nature or nurture; free expression or the equally restrictive directive instruction. Yet with so many choices, according to these educators, and I believe according to experience as well, we still fall short of an informed procedure for stimulating the growth of real creativeness, leaving us, as art educators, in the untenable position of being unable to develop the creative potential of each individual child. Thus Rowland speaks of art learning as a problem solving process that "bridges inner experience with outer reality." 21

THEORETICAL RATIONALE

DEVELOPMENTAL PROCESSES

The preceding dichotomy in art education between "nature and nurture" and the corresponding debate over the issue of "unfolding" or instruction in art arose from opposing interpretations or views of the child, and developed without the advantage of modern psychological findings. Possibly this dichotomy will be lessened when seen from a developmental perspective which offers balancing criteria for attributes on either side of the mean between these two untenable poles. Increasingly, art educators have become aware of the fact that there is a case for instruction in art. Then one must ask . . . what type of instruction, and to what end? As one investigates these questions it becomes obvious that there is another concern . . . When should instruction occur? Is there a time that is optimal for instruction in art? And it is in the latter question that developmental psychology proves itself essential to (a study of) art education. If one applies the findings of this science to art education, one must conclude that not only is there an optimal period for art instruction, but there are periods when art instruction is of no real benefit, and there may be a "last chance" point in a child's artistic (growth) beyond which he may not develop.

Developmental psychology has particular pertinence to any discussion of art education.

Only when one begins to focus on questions like the rate of growth, the meaning of spurts in growth, the organization of physiological systems, and, most centrally, on the possibility that physical growth in two periods of life, such as infancy and adolescence, may be mediated by different physiological mechanisms and affect different portions of the body, has one focused on developmental issues. For it is the burden of developmental psychology to discern qualitatively different stages in physical, intellectual, and affective growth, the fundamental units and operations entailed in each stage, the factors contributing to the growth and differentiation of each, and the interrelations and organization among them. 1

Essential to any such discussion is the developmental perspective of the genetic epistemologist, Jean Piaget, who sees intellectual development as consisting of broad stages, each stage representing a qualitatively different way of thinking about the world, of thinking altogether, each stage logically following its predecessor, in turn becoming the necessary ingredient for progress to subsequent stages.²

Sullivan offers a brief outline of Piaget's mental developmental stages:

- 1. Sensorimotor Stage (0 to 2 years)
- Pre-operational Stage
 - a) preconceptual thought (2 to 4 years)
 - b) intuitive thought (4 to 7 years)
- 3. Operational Stage
 - a) concrete operational thought (7 to 11 years)
 - b) formal operational thought (11 to 16 years)

Since most interpretations of Piaget are otherwise essentially the

same, for the purposes of this discussion Gardner provides a succinct summary of each of these stages:

Piaget sees intellectual development as consisting of four broad stages: a 'sensorimotor stage', occupying the first two years of life, during which the child gains a practical knowledge of the physical world about him, coming to understand, for example, that objects have a permanent existence within a framework of space and time: an 'intuitive' or 'semiotic' stage, covering the period from ages two to six or seven, during which the child explores various kinds of symbols and images representing the world, but does not yet do so in a systematic or logical way; a 'concrete operational' stage, extending from about the age of seven to the age of twelve, wherein the subject becomes able to think logically about objects, to classify them consistently, and to appreciate their continuity despite alterations in the momentary appearance; a 'formal operational stage', commencing in early adolescence, at which time the child becomes able to reason logically using words and other symbols so that he can create a world and make deductions about it, without departing from the 'abstract' or 'theoretical' level.4

Thus Piaget establishes a hierarchical structure that correlates chronological age with cognitive developmental stages.

Within this hierarchy Piaget distinguishes between perceptual images, representational images and conceptual schemas. Perceptual images are the ones we have when we look at an object; representational images are the ones we retain as memory images after our experience with the object; conceptual schemas are the informational materials about the object that we retain in the mind in the form of words. Also, he further substantiates the notion that young children perceive differently from adults by illustrating that they pass through three successive stages in

the achievement of perceptual images during the sensorimotor, or first stage of development without any indication of representational or conceptual images. Piaget showed that the representational images also pass through successive stages of development, and they do so during the concrete operations period of development. "Because drawings are based upon representational images, Piaget's findings suggest that children's drawings exhibiting certain spatial relationships will appear quite some time after the child is able to perceive these relationships." According to this theory of development, the child's achievement of representational or conceptual images lags behind his achievement of perceptual images.

Epstein concedes that the universality of the Piagetian developmental stages of intelligence has not yet been proven. The offers another theory of developmental processes, phrenoblysis, which suggests the correlation between spurts of growth in the brain itself with Piagetian stages of mental growth. Referring to two components of brain power, 1) increase in brain weight associated with increase in body weight, and 2) spurts of 5 to 10 per cent in brain weight during specific periods, Epstein found that:

. . . human brain growth indeed occurs primarily during the age intervals of three to ten months, and from two to four, six to eight, ten to twelve or thirteen, and fourteen to sixteen or seventeen years, and that these stages correlate well in timing with stages found in mental growth. Further those experimentally established intervals correlate in time with the classical stages of intellectual development as described by Piaget, except that the fourteen-to-sixteen-year brain growth stage has no Piagetian counterpart. . . Very recent work by

Artin yields the beginning of evidence for . . . this hitherto unknown stage of intellectual development 1... To pass from one stage to another (intelligence) requires the prior change in the structure containing the mind: an expansion of the brain. 1... There are many published studies of head circumference and they provide the same pattern and ages of growth spurts as found for brain weight. 1...

Further to this, Epstein indicates that the growth of brain weight and head circumference show a marked difference between the sexes after age ten. Girls' head growth between ages ten and twelve is about twice that of boys', while the situation is reversed for the growth spurt centered around age fifteen years. 14

Epstein suggests nutrition and environmental enrichment/
deprivation may be the implicating factors in brain growth phenomena.

He describes the biochemical nature of these spurts:

Cell replication ceases at about age one and one-half years. Therefore, increases in brain weight after that age must reflect changes within the cells themselves - in protein, ribonucleic acid (RNA), lipids, and water. The water content was shown to decrease steadily after birth, so that weight increase must be due to the other three substances. These substances would increase as a result of growth of the cells represented in lengthening and/or branching of axons and dentrites or in myelination (insulation) of axons. The later event would increase the efficiency of signal transmission while the axonal and dendritic changes bespeak increased complexity of neural networks, which should then inhibit increased functional complexity and competence.15

Epstein emphasizes that growth stages are a scientific fact, not just theory, and that the correlation of these stages with the Piagetian stages has a factual character.

It is important to emphasize that the brain growth stages are not a theoretical notion but a scientific

fact for which the evidence will be sketched in the pages to follow. Mental growth stages have a similar factual character as does the correlative connection of brain growth stages with the ages of onset of the main Piagetian stages. 16

Epstein asserts that as yet it is not possible to know in what region or regions of the brain growth has taken place, nor does he expect that the same localization and events will be found in all the spurts.¹⁷

Since Piaget was investigating cognitive development only, and explicitly stated that he was not interested in creativity or the arts, it is rather useful to examine just how one could relate Piaget to affective development and what conclusions could be reached from such an exercise. Lansing and Gardner project artistic developmental stages on the basis of Piaget's analysis.

Lansing interprets Piaget to indicate three main stages with various sub-stages of cognitive development and expands upon these to illustrate (indicate) how they apply to artistic development.

1. Sensorimotor period (0 to 2)

II. Concrete operations period

- a) pre-operational substage (2 to 4)
- b) intuitive thought (4 to 7)
- c) concrete operations (7 to 11)

III. Formal operations period (11 to 15)

According to Lansing, during the sensori-motor stage the child merely develops his perceptual images, with no attempt to construct conceptual images. This involves a perceptual and motor adjustment to the world, but not drawing or visual symbolic manipulation of any kind. Through visual and tactile exploration, he learns to coordinate vision and grasping, to perceive the permanence of solid objects and the constancy of size and shape, and spatial relationships of a Euclidian and projective nature, and to perceive relationships between objects. 21

An extensive perceptual activity continues, and as visual and tactile movements become more highly co-ordinated, the child begins to develop a mental image which marks the beginning of the second stage of development, the concrete operations period lasting from about age two to age eleven. According to Piaget, the child's previous lack of mental image prevented him from drawing and thinking intelligently. As he acquires representational or conceptual images during this period, the child becomes increasingly capable of conceiving of concrete objects and of thinking about them. The spatial relationships within them and among them become clearer to the child, allowing him to draw objects more

naturistically and more accurately in relationship to each other. 23 But his thinking and his visual symbols are usually confined to concrete objects and events, with little evidence of abstract ideas, either in his thinking or in his creative productions. 24 However, since these changes in thinking and drawing occur in fairly definite stages themselves, this concrete operations period is divided into three substages: the preoperational substage from about age two to age four; 25 the substage of intuitive thought from about age four to age seven; and, the concrete operations substage from about the age of seven to age eleven. 27

In the pre-operational substage, the child makes his first unorganized attempts at symbolic representation, developing from simple scribbling by age three to spontaneous drawings of the human figure that indicate the fact that at this particular stage his concepts of topological relationships of proximity, separation, order, enclosure, and continuity are not fully developed.²⁸

During the stage of intuitive thought, his drawings show an intuitive, rather than thoughtful organization, with topological relationships within the human figure more clearly understood and more convincingly drawn, and forms that contain Euclidian relationships beginning to appear.²⁹

At about age six or seven, "the child's perceptual activity and his drawing have been extensive enough so that he develops a more co-ordinated mental image of the world."

child enters the concrete operations substage which is characterized by reversibility in his actions, i.e. the ability to retrace action to its starting point, thus acquiring a reference point. 31 It is the first time the child is able to imagine the relationships between concrete objects and organize those objects meaningfully in his drawings. Finally, his work is spatially organized. He is now drawing objects in a more natural relationship to each other because he is "drawing what he conceives rather than what he perceives." 32 According to Lansing's interpretation, Piaget sees the child perceiving meaningful relationships even "during the first two years of his life." But despite these perceptions, the child has still to achieve representational control of them through conceptual growth. Thus Lansing concludes of the concrete operations state that it would be inaccurate to describe the work of the child at this stage as a kind of visual realism. In his opinion, it is more correct to speak of it as conceptual realism. 33 This is a significant distinction if one recalls Piaget's own distinction between perceptual images, representational images, and conceptual schemas.

Then, between ages nine and eleven, the child's visual symbolization becomes more highly naturalistic as his concept of spatial relations becomes more accurate. As distortions of reality appear, as his drawings begin to deal with abstract concepts, the child enters the formal operations period of conceptual development.

The child's conceptual development now permits philosophical thinking; ideas and arguments that go beyond concrete content can now be entertained. This is the first time that it would be appropriate to consider the possibility of conscious abstraction in the child's work.

In conclusion, Lansing's interpretation of Piaget may be seen to have real significance to a study of drawing. Lansing suggests that "Piaget's work gives further substance to the notion that a child's visual symbols are intimately related to his conceptual growth." Because the child's concepts lag behind his percepts until he approaches adolescence, "if we wish him to change the shape of his work, we must change his concepts first." Further, though he does question the virtue of representational drawing, he suggests that by engaging the child in selected perceptual activities we might speed the development of the child's concept of space. 36 Finally, since " . . . a coordinated concept of the world depends upon perceptual action in relation to a point of reference," rather than the visual-haptic personality being an inherited tendency as Lowenfeld posited, possibly the "nonvisual person could have his spatial concepts developed."37

Gardner, recognizing that Piaget's conclusions were based entirely upon cognitive development, suggests that Piaget does not focus on forms of thought other than those central to the

achievement of the scientist. He interjects the possibility that Piaget's concrete and formal operations are not directly relevant to the artist's task, for which that versatility with a medium represents an extremely sophisticated cognitive achievement. To support such possibilities, he makes two points:

First, there is renewed recognition that artistry is not just 'less-developed' science, but rather involves different processes of thought with their own evolution; artistic cognition may not involve qualitative changes after early childhood, but it continues to deepen and evolve for many years. Second, this perspective helps to explain why individuals in other cultures, including the so-called primitive societies, who do not exhibit types of thought crucial to Western science, nonetheless produce artistic works and exhibit an aesthetic awareness commensurate with, if not superior to, our own. We must acknowledge forms and extensities of thought other than these upheld by Piaget; the particular genius of 'medium knowledge' and 'symbol use' has to be recognized. 38

Gardner has devised an informal model of artistic development which accommodates the concerns of this area. His model consists of four stages: the infant stage; the symbolic period; the period of pre-adolescence; and adolescence.

In the infant stage, the child is involved in the development of basic sensory and motor capacities, in constructing knowledge about the physical and social world. Because Gardner sees the arts as "integrally and uniquely involved with symbol systems", he sees the infant's activities as a prerequisite for artistic activity, but "not in any powerful sense involved with the arts."

Between the ages of two to seven, during the symbolic period, the unique role of symbol systems in art becomes apparent. 41

The child's capacity to use, manipulate, transform and comprehend various symbols is maturing at a ferocious pace. He has gained enough of an intuitive familiarity with symbol systems that he can work with them adequately. While he knows little and can accomplish little that is subtle and complex, he is superbly equipped to learn. 42

Though there are differences between children, what is most striking, however, about the events of this period is that they seem to be similar in most children and that specific instruction has relatively little effect on what the child does. . . . The principal stages affecting young children across cultures, and across media, are persuasively similar. . . My best guess is that during this symbolic period the child is propelled by a dynamism all his own. Like a seed with its own plan for development, the child is following the inner logic dictated by his own sensorimotor development and the nature of the particular symbols with which he is working; external interference and efforts at instruction rarely prove valuable or productive. 43

To Gardner, the child of seven or eight has the "mental equipment" to become an artist, being significantly deficient only in the task of being a critic, because as in Piaget's formal operator stage, this task requires an ability to reason on the level of words or logical propositions. However, at this point in his development, instruction has neither meaning nor value to the child.

The third stage evidences a mastery of symbol systems.

From seven to thirteen is the period of preadolescence in which a child seems superbly equipped to learn just about everything.

Many of our data about children's artistic capacities describe this period of life. . . . We have found, basically, that children around the age of seven or eight suffer from a number of woeful aesthetic misconceptions or impairments, which, fortunately, prove to be quite reparable 45. . . children of this age (sixth, seventh grade) generally exhibit a tremendous ability to acquire within a short time new skills in the arts; they enjoy doing so; they are not overly distraught by terminology, by errors, or by empty verbalisms. They are ready to plunge in, to forge ahead, to gain mastery. 46

Their stage of mental development and their natural enthusiasm suggest this to be a prime time for instruction.

The fourth and final stage in Gardner's model is adolescence, which differs demonstrably from the previous stage. "It is not that adolescents are in some absolute sense less intelligent, or even necessarily less motivated. But for a reason that we do not yet completely understand, enthusiasm about acquiring skills in the arts and the ready capacity to immerse oneself fully in an expressive medium seem lacking in most adolescents, especially in our culture."

Thus Gardner, while recognizing the natural expressiveness of young children, draws our attention to critical stages in the artistic development of children, one occurring sometime after the age of nine in preadolescence, and another during adolescence. Though instruction proves of little value to the younger child, it has a marked effect on the preadolescent, and this effect possibly lessens the trauma of the adolescent period.

Viktor Lowenfeld also describes developmental processes for child growth, both cognitive and affective, but he places far more emphasis on the affective aspects of learning. He distinguishes between two types of personalities, the visual and the non-visual,

the non-visual or haptic being characterized as a person who can not co-ordinate his partial impressions to form a mental image.48 Lowenfeld sees the development of a child's art to be consistent with the child's own development, his drawing going through fairly definite stages starting with the first marks on paper and progressing through adolescence. First is the Scribbling Stage 49 of the very young child to be followed at about age four by the first attempts at representation in the Preschematic Stage. 50 In the Schematic Stage 51 from about ages seven to nine, the child develops a definite form concept, symbolizing parts of his environment in a descriptive way with schema which are often arranged along a drawn baseline. By the time he reaches the age of nine and enters the Stage of Dawning Realism, or the Gang Age, 52 with a characteristic concern for peers and an increased awareness of himself, the earlier spontaneity and freshness is replaced by smallness, detail, and self-consciousness. At about age eleven or twelve, he enters the stage of reasoning, the Pseudonaturalistic Stage, 53 which is characterized in drawing by an interest in natural surroundings, a concern for proportion and depth in drawings, an awareness of differences and gradation in colour and detail, and an awareness of sexual characteristics in drawings of the human figure. Lowenfeld claims that this stage marks the end of artistic development for some, with adult drawing often being typical of that of the twelve year old.

Though it is possible to consciously develop artistic skills beyond the age of fourteen, in most instances the child's natural development does not extend beyond this stage. Though Lowenfeld describes this growth as taking place in stages, he recognizes that art is continuous and thus these stages are flexible, fusing into one another to allow for the individual differences of children. Typically, the stages are consistent and follow one another except in the case of the exceptional child. Though instruction in drawing doesn't appear to alter these stages, particularly the early stages, Lowenfeld does indicate that by ages eleven or twelve, the effects of training can be seen in the child's work.

Eisner also recognizes that developmental stages in children's art correlate more or less with chronological age, extending "from random scribblings of the two or three-year old to the sophisticated use of graphic and painting techniques that convert a two-dimensional surface into a three-dimensional illusion." ⁵⁷ Eisner's first stage, about ages two or three, is that of "function pleasure" ⁵⁸ where the materials are used in a "consummatory, not an instrumental, fashion for the stimulation and satisfaction that their manipulation yields." In the pictographic stage, from ages three or four to nine or ten, the child used symbols or "pictographs" to convey his ideas in a manner of storytelling. It is at the end of this period, at

about ages nine or ten, that children become dissatisfied and try to create "more visually convincing pictures." At this, the "representational" stage, 60 ages ten or eleven to about thirteen, the child is interested in finding out how to create the illusions that will make it "look right." Finally, during early adolescence, the child enters the "aesthetic-expressive" stage which has been latent and of secondary importance throughout the previous stages. Only a small percentage of children acquire the skill necessary to realize this stage in its "full-blown" form.

When we remember that what gives the arts their special power is the artist's ability to construct and organize form in a way that embodies and therefore conveys the feeling he is interested in articulating, it becomes clear that this stage gets to the heart of artistic expression. By itself there is no artistic virtue in representational drawing, even when the images are hyper-realistic. Such skill manifests itself only as technique, and, while technique is a necessary condition for the creation of art, it is not sufficient . . . What is significant in the creation of art, aside from significant insight and idea, is the ability to create forms that, in fact, express in nonverbal ways what cannot be conveyed in any other way. Few children achieve this highest stage of development in the visual arts, . . . aesthetic and expressive concerns are present, to some degree, in all stages . . . It is in the aestheticexpressive stage, however, that the dominant focus centers upon the aesthetic and the expressive aspect of form, and it is at this stage that most children terminate their formal art education. 62

Thus Eisner concurs with Lowenfeld and Gardner that at some point prior to adolescence, children reach a plateau which for some marks the end of artistic development.

Developmental psychology is in vogue - one

could compile a book of various models of artistic development, all more or less derived from or in reaction to Piaget's model of cognitive development. Most of the models take a special emphasis, while drawing from a Piagetian structure. Lowenfeld's descriptive model more or less parallels Piaget by means of a fresh schema defining affective development. Lansing simply attempted to apply Piaget's model to artistic development.

Gardner used Piaget as a baseline for his own developmental model to account for the symbolizing systems peculiar to artistic expression. Eisner avoids reliance on a developmental model in Piagetian terms and advances his own prescriptive developmental model that highlights the intentional experience of the child at each level.

Closer examination of even these models reveals that certain threads appear to be common to all of them. However they describe or label the stages of development, it would seem that four very distinct periods are recognized: the infant stage; the period from about age two to eight or nine; the preadolescent state lasting until eleven or twelve; and the adolescent stage. It would also appear that the child's artistic development could be divided into three periods, the first of which takes the child to about age nine, which involves concrete objects and events, and is characterized by a spontaneity and freshness, an easy, natural expressiveness which is not demonstrably improved by

instruction. At about age nine or ten he reaches a critical point in his artistic development. Garnder indicates that the child now is most capable and willing to learn but lacks information and skills. Lansing suggests that he has interest in certain areas but lacks the corresponding ability. Eisner emphasizes that the child now wants to create more visually convincing pictures; he wants to know how to create the more sophisticated illusions of space.

We must recognize that representative drawing requires that a child reduce his three-dimensional experience and ideas to a two-dimensional form. If his skill in some of the techniques of such representation is left to his own trial and error, he generally becomes discouraged, and often turns from the medium, without ever learning the non-representative aesthetic values which can be attained when his conceptual development would permit such abstractions, particularly if supported by appropriate guidance of his artistic activities. I am thus espousing the view that the concepts utilized in aesthetics are developed later than the period in which the child's nature and learnings lead him to value skill in visual representation.63

If he is not helped in this period, he becomes frustrated, discouraged - his artistic development reaches a plateau beyond which he may never progress.

In keeping with this developmental trend towards atrophy of skills and artistic interest in late preadolescence, Herbert Read holds that the young child progresses naturally through subsequent stages, very busily engaged in expressing, communicating, and acquiring skills. He discusses Burt's description of what, at this

point, could be described as preadolescent phenomena, taking some exception to the supposed inevitability of the stage of "repression."

Repression - Age 11-14

This stage sets in most commonly about the age of 13. Burt (and his view was representative at the time he wrote) regards this stage as part of the child's natural development. Progress in the attempt to reproduce objects is now at best laborious and slow, and the child becomes disillusioned and discouraged. Interest is transferred to expression through the medium of language, and if drawing continues, the preference is for conventional designs, and the human figure becomes rare.

Artistic Revival - Early Adolescence

'From about the age of 15, drawing for the first time blossoms into a genuine artistic activity . . .' But by many, perhaps by most, this final stage is never reached. The repression at the previous stage has been too complete. 64

Though Read prescribed encouragement rather than instruction to remedy the negative qualities of the period of Repression, he obviously would concur with Eisner as to when artistic development is most likely to cease.

Eisner claims that a child's development in art reaches a plateau with respect to the sophistication of its graphic techniques at about age twelve to thirteen. From ages two to thirteen there is a regular and predictable development in the way children create the illusions of space through size relationships and overlapping forms in their drawings until about age twelve. Beyond thirteen, without instruction, the earlier required skills develop very slowly, to the extent that many adult drawings cannot be differentiated

from those of young adolescents. For Eisner the reason for this is simple enough. Drawing and painting are the products of complex skills. Such complex skills develop from practice and instruction, rather than from simple maturation. He emphasizes the importance of technique in children's drawings, not to the expense of freedom and spontaneity, but to the end of enhancing the expressive potential of the child.⁶⁶

Gardner addresses this problem of decline of interest at adolescence, using Piaget's reasoning that at this particular period

the child is developing his critical reasoning skills to a new level. . . . he may adopt a much more critical opinion of his own work, comparing it unfavourably with what highly skilled individuals are accomplishing. If he finds his own capacities inadequate in comparison, he is no longer motivated to continue producing. And he remains, at most, a perceiver of the arts. 67

Thus Piaget's formal logical operation which is beneficial to the linear development of scientific capacity proves severely problematic to the "lifeline of artistic development [which] is punctuated by ups and downs," 68 and, in fact, may prevent or hinder artistic creativity. Gardner prescribes:

If we are to prevent this decline of interest (and possible decline in skill), our pedagogical efforts during the pre-adolescent period become extremely important. Sufficient progress in teaching or training should, therefore, be realized, so that when the child finally gains in critical acumen, his works will not seem so inadequate that he quits in despair.

Skills should be developed to a sufficiently high level so that the child's work will, objectively, possess merit; he will then feel less need to reject what he has done. Second, and of equal importance, the child should be

encouraged, gently and definitely, to take a somewhat more critical stance toward his work during preadolescence . . . When he enters adolescence criticism is already a familiar tool that he can now apply by himself as well as accept graciously. In the cultivation of this capacity, I think, lies our best hope of preventing the army of child artists from narrowing into one lonely platoon—of maintaining a garden of young painters instead of a barren row of survivors—during the interval from childhood to adulthood. 69

Thus Gardner establishes the need for a programming of instruction in art, based upon the developmental processes of Piaget.

If one examines the two previously mentioned critical periods, they point to one crucial period in the child's artistic development . . . the middle years, preadolescence. The early years are "golden", a time of natural development of artistic competence when instruction has little effect. But during the middle years, confusion and frustration may replace this natural expressiveness. At this point the child is equipped with boundless energy, ability and desire to learn, to make things right, as he conceives them to be. Yet, just as often, he cannot communicate his ideas through a material, and resorts to stereotypes because he lacks particular skills. If he is to use a material as a true medium of expression, if he is to go beyond stylization, then he must have access to particular skills or techniques in order to free his artistic potential. On the strength of developmental psychology, the middle years seem to be the stage at which art instruction is most necessary and most beneficial. Not only is this the period during which the child is most receptive, and possibly most in need of instruction, but also, as Gardner has

indicated, preparation in this period may lessen the decline of interest in adolescence. It appears that the younger child is not yet ready to receive instruction, and instruction does not seem to meet the particular needs of the adolescent. The period of the middle years seems to present itself as a logical time of instruction - the need is there and the child is receptive.

If we can stimulate the child's unaware production to such an extent that it reaches in his unaware style a 'creative maturity' which will be able to stand the critical awareness which once will set in, we have kept the child from making a sudden change and have protected him from disappointments or shocks with regard to his changing imaginative activity. 70

In fact, it does seem that the overlapping period between the middle years and adolescence might present the last stage within the Piagetian structure for meaningful instruction in art. This is a point of fusion between two very distinct age groups. The child between the ages of eleven and thirteen fluctuates between the two chronological groups, alternately exhibiting characteristics of either one. This might represent the last occasion when the child experiences both the need for particular skills or training and a sufficiently undefensive attitude toward receiving them.

THE NATURE OF ARTISTIC LEARNING

opinion among many of today's art educators when he states:
"An orgy of self-expression is no more productive than blind adherence to rules."

But what then should be the approach of art education? Clearly the directive approach does not suffice the needs of expressive development. But then neither the conscious removal of directive influences nor the unconscious effects of non-directive ones provide the student with a means of developing artistic potential. Though permissiveness and nurturance are generally considered to reflect a certain empathy with the nature of childhood, it is naive to assume that this is all that is necessary to develop the child's potentiality. We do the child an injustice to provide him with no more.

More recently, art educators tend to strike a balance between directive and non-directive influences, between instruction and free expression. Neither the teaching skills nor the nurturing of free, self-expression should be a singular consideration. One is essential to the other, and as such, should be developed in accord with, rather than in isolation of, one another. Thus, the more effective approach to art education

is to nurture particular skills in the interest of developing expressiveness - if the child is to express himself, he must have the mastery of certain skills essential to this expression.

In the name of free expression, we have often failed to <u>achieve</u> expression through visual form . . . What I am urging, therefore, is an appreciation of the reciprocity between discipline and freedom. Freedom requires discipline - a sense of mastery in pursuit of style.²

To assist the student to such mastery the teacher will have to provide some curriculum activities that are not product-oriented, but "are intended to develop those skills necessary for truly expressive and imaginative work in art," to be followed by projects in which these skills are utilized. Essential to skills mastery is continuity for internalization, sequence for increased complexity, 3 and depth for control and confidence. 4 To this end Eisner proposes: "An art curriculum utilizing these principles would consist of both instructional and expressive objectives." The activities or learning experiences would be both instructional, i.e. designed to develop particular skills, and expressive, thereby encouraging the child to use skills acquired in the instructional context for personally expressive and imaginative goals. "These two types of activities and objectives would constitute the rhythm of the curriculum."5 Eisner defines curriculum as . . . "a series of activities designed to engage the student in some content that is intended to have educational consequences." He further designates "activity" as central to his concept of curriculum, activity implying "that the

curriculum is going to engage the student in some type of action."

One way of applying Piaget's findings to art education would be that of accepting the premise that there is something inherent in the cognitive structure of children that sets absolute limits to their graphic or visualizing abilities and that possibly there are reasonable and reachable expectations for children at various stages in their artistic development. Eisner warns us against setting artificial ceilings on expectations of children's development by underestimating their potential for growth or overestimating their capacity to cope with certain forms of artistic problem solving. Being a major proponent of the view that certain skills are essential to art, and must precede expressiveness, he insists that artistic development is not an automatic consequence of maturation, but a process that is affected by the type of experience children have, a process that is facilitated through instruction.

Artistic development . . . is not a simple unfolding of a preprogrammed genetic constitution . . . Artistic learning is complex and is strongly influenced by the environmental conditions in which it occurs . . . When left to their own devices children show great ingenuity in devising forms to convey certain ideas. But these achievements, as real as they are, fall short of what is possible to achieve when learning is facilitated. For many youngsters, the lack of [highly refined] skills has bred a sense of impotence in art, a conviction that they are inherently unable - or as they say 'untalented', in this area of human activity.8

Eisner, then, establishes the need for facilitated learning.

Most often the child does not discover for himself all that he needs to know in order to let his ideas, percepts and

feelings flow through a material, a medium of expression. Denied this particular advantage of instruction, he is at a loss to express himself satisfactorily, is frustrated, and tends to become inhibited. "It is when skill is absent that confidence diminishes and tightness and rigidity enter." And this is precisely the situation for many preadolescents. He is at a critical point in his development, vacillating between the characteristic unconscious awareness of the child, and the conscious awareness of the adult. If, as indicated earlier, the major change at this period is indeed due to the change from purely unconscious imaginative activity to critical awareness, then it is essential that the child be able to create a product which will satisfy himself. With his newly developing critical awareness, the process does not serve much purpose at the moment since the object of his consuming interest is the end product.

Being aware of the adolescent's emerging critical interest in his art product, and of the preadolescent's apparent inability to match his percepts, concepts and feelings to his medium, let us examine this preadolescent phenomena with an eye to the nature of instruction and the role of the teacher in this critical period just prior to the advent of adolescence. Let us adopt the assumption that the child not only benefits from, but indeed needs instruction in art education, that the optimal period for this instruction is

during preadolescence, and that the last chance for instruction maximized by proximity to growth pattern lies somewhere about the ages of eleven to thirteen. What then constitutes instruction? What is the nature of an instructional strategy that does not inhibit, but indeed enhances, creativity and expressiveness? If artistic learning is not an automatic consequence of maturation, what then is its source?

There is a considerable diversity in approach to understanding a child's means of artistic production. June King MacPhee proposes a theory of artistic development, the Perception-Delineation theory that takes into account individual learner differences and the psychological and cultural-anthrapological factors that affect learning. A simple description of the factors in the child's productive process would include (1) perception of the visual world, (2) psychological and cultural factors, (3) organization of the information, and (4) creation or borrowing of symbols to communicate a response. 11 Gombrich emphasizes the importance of the procedure of 'making and matching' in the production of art; the child invents a schema and through trial and error attempts to match this schema to the image. 12 Thus, the child learns to invent forms or illusions in order to communicate through a material or medium. These two approaches to the child's productive skills will be further differentiated in Eisner's analysis.

Eisner describes artistic development as the product of complex forms of learning in three realms: the productive, with

skills and sensitivities necessary for producing visual art; the critical, with an ability to respond sensitively to visual forms made by man and nature; and the cultural, the ability to appreciate, through understanding, the functions art performs in man's cultural experience. ¹³ For the purposes of our discussion of representational drawing, let us examine Eisner's productive realm more clearly:

First, I have agreed that artistic development is not an automatic consequence of maturation but rather a process that is affected by the type of experience children have. In large measure, a child's artistic ability is a function of that which he has learned. Second, I have argued that in the productive realm, the realm dealing with the creation of art forms, a variety of factors come into play. One of these is the ability to perceive the natural environment and to imagine visual possibilities in the mind's eye. A second of these factors is the management of material so that it functions as a medium, a vehicle through which expression occurs. A third factor includes the ability to invent schemas that will transform an image, idea, or feeling into an appropriate form within a material. this sense the child's creations, both early and late in his career, can be viewed as visual codes through which his ideas, images and feelings are rendered. As the child works with material and as his experience grows, he invents or learns to employ an increasingly wide array of techniques for rendering these schema with greater versatility. Finally, the child needs to learn how to see the forms he creates as part of a total and emerging visual configuration and to make decisions in light of these relationships. 14

Eisner's productive skills then involve imagining visual forms, managing material as a medium, inventing schema or visual codes to communicate through a medium, and deciding on forms in a holistic context. He recognizes the complexity of artistic production and refutes the notion that a child's development in art is genetically programmed. Age related changes in children's drawings are a consequence of learning which is enhanced by competent instruction. 15

Eisner recognizes two dominant modes through which artistic production occurs: that which occurs through the natural exploration of activities of the hand and eye; and, the intentional—which is the product of a will to transform a private idea, image, or feeling into a visual form in some material. In the second mode the child encounters the problem of inventing a form that will stand for what the child intends. The young child does this quite naturally, by inventing schema which are reduced to their simplest structural features and which function as "structural equivalents" for what he sees or imagines. With increased experience, older children correct or refine these schema through increased differentiation in the created image, learning to create illusions of a third dimension with perspective drawing, value differentiation, and use of light and shadow.

Generally in the intentional mode the child employs three modes of visual coding: the pictographic; the representational; and the expressive. ¹⁸ The young child's symbols or schema are pictographic art. Representational art moves beyond substitution to an attempt to imitate nature.

Representational art is, in part, an effort to create the illusion of the visual world in some material . . . Here mimesis is intended. And because the intention of the child is one of imitating the visual world or image his task is considerably more complex than the invention of pictographic forms. In this mode the child must cope with all the problems of perspective, light, shade, and color . . . The successful resolution of these problems yields for the child an array of visual devices that becomes a part of his artistic repertoire and that he can employ when dealing with subsequent problems. 19

In the expressive mode the invention and organization of form is purely for the sake of expressing feeling.²⁰ Thus the child has three modes of visual response.

Of particular interest is Eisner's emphasis on the relation of visual perception to the intentional mode of art production and thus to representational drawing. If the preadolescent child has an increasing interest in creating a satisfactory art product, and if that is best described as representational drawing, then the significance of visual perception to art instruction cannot be overestimated. First, the child must learn to respond to the visual forms in both art and nature that are about him, and then to use this date acquired through such perception as a resource for his own work.

The art of creation does not emanate from a vacuum. It is influenced by the experiences that have accumulated through the process of living. If that process did not include much nurture from the visual world, it is not likely that the world will become a resource which the individual can draw upon for his own creative work. It is in this sense that heightened powers of aesthetic perception provide access to those phenomena that the individual uses in his work. It is also in this sense that seeing, rather than looking, becomes a sign of achievement and not merely a task. To see is to acquire visual meaning through experience. To merely look is to engage in an act that hopefully terminates in seeing. 21

Secondly, the child must perceive the qualities that emerge as he works with a material, to look holistically at an emerging painting or drawing, attend to a host of visual factors and make decisions about them. The problem of creating a drawing or painting

is not merely one of dealing with particular forms; it is also one of organizing these forms so that some cohesive whole is achieved; thus it involves the relationship among separate forms, or composition. Arnheim described the characteristic tendency of young children and untrained adults to focus on forms in isolation of one another as "local solutions." Piaget described a similar tendency of young children to focus on particular forms or aspects of a form without relating that aspect to a larger field, as centration. 23 Eisner agrees that individuals with underdeveloped perceptual skills do tend toward centration, and suggests that perceptual development with respect to art and art related tasks is evidenced by the individual's ability to see complex visual relationships, thereby having contextual vision rather than focal vision. In addition, perceptual meaning acquired through refined sensibilities goes well beyond attention to the formal structure of visual form, 24 to the covert meanings or implications of the situation. 25 further suggests that the ability to perceptually differentiate visual forms can be facilitated through experience. 26

Yet if the work is to function as a whole . . . the total set of relationships between forms needs attention . . . This type of seeing and construction for the purposes of aesthetic order, expression, or the creation of the illusion of depth needs to be developed. The child needs to learn how to attend to the interrelationship of the qualities he has created and to make ongoing decisions in light of these qualities and the purposes he wishes his work to serve . . . For those without such experience and skill, one must gradually learn to see these qualities.

One further perceptual skill that Eisner identifies is that of attending to the expressive character of the visual form. It is not enough to note visual relationships in a strictly formal sense - all visual forms have some expressive, or physiognomic qualities.

Everything that we perceive can be attended to with respect to the quality of feeling the object or event illicits. The impact of an image is not simply its ability to attract attention, nor is it simply the fact that its qualitative relations may be vaguely pleasant. The impact and import of an image is the sense of feeling that it generates in those who encounter it.²⁸

In fact, Arnheim suggested that expression is the primary function of perception. ²⁹ Eisner qualifies this: "Not all who look at visual form are able to perceive its expressive content." ³⁰ The expressive content may be too subtle or the individual's frame of reference or expectations may be inappropriate. "The expressiveness that a form conveys is an important aspect of its total character but to experience it is, in part, the result of learning to attend to the form appropriately." ³¹ The facilitation of this learning is an important aspect of the teacher's role.

Thus, from an instructional point of view, an examination of Eisner's artistic learning would seem to place major emphasis on experience, particularly visual experiences.

The ability to see, to conceive imaginatively, and to construct are abilities that are profoundly affected by the kind of experience children have. It is precisely in the provision of environmental conditions—through curriculum and teaching—that the teacher has an important contribution to make to the child's education in art.³²

One of the major contributions of the field of art education can be said to be one of helping people learn to see qualities that normally escape attention. As MacPhee cautions, "Looking requires visual organization . . . Concepts are evolved from experience, but if the experience is limited by lack of visual awareness, the quality of the concept will be poor." It is in this task of "learning to see" that the teacher of art is instrumental, helping the child enhance his perceptions, thereby providing him with an enriched resource from which to draw upon for his artistic endeavours. In order to teach children to see, one must have some understanding of what is involved in the process of seeing, some understanding of the nature of visual perception.

VISUAL PERCEPTION

Since we have set the task of art education to be that of helping the child to see, a close examination of visual perception will be made to determine what indicators it offers for art instruction. Eisner denotes experience as an essential factor to all aspects of the productive task, experience which is partly the result of learning. Of particular interest is the experience of seeing, of perceiving. The experience of seeing, of perceiving, receives particular attention in Eisner's productive realm:

What . . . some people fail to realize is that the ability to perceive is a learned ability. We are not born with 'sight', we acquire it through experience and through trial and error. To see something is to have intellectually constructed a perceptual realization.

In tracing the process of developing perceptual ability, Eisner tells us that studies of perception show that first the infant co-ordinates his vision. Next he learns to focus, to track moving objects, and to anticipate the visual probabilities of the environment. Then he learns to associate words with visual forms, eventually substituting the words for forms. From this point words tend to supplant visual information.

"Perceptual processes tend to be put in the service of concept formation," with labelling used primarily for purposes of recognition. "And when recognition is the driving motive, the enrichment of perception through visual exploration is diminished," 4

at which point "our eyes are reduced to instruments by which to measure and identify . . . hence an incapacity to discover meaning in what we see."

What is the nature of visual perception? Is it the equivalent of seeing? Does it involve more than erely looking? The following sampling, typical of the pertinent literature prescribes that visual perception is more than a simple stimulus-response phenomenon, more than simply what is received by the senses after stimulation by the outer environment. Physically vision begins at the retina which contains typical brain cells as well as light sensitive detectors. Effectively, the retinas are divided vertically down the middle so that fibres from the left side of each retina go to the left side of the back of the brain while those on the right side of each retina correspondingly go to the right side of the brain. The fibres cross at the optic chiasma, and pass through a relay station in each hemisphere, the lateral geniculate body, before reaching the visual region at the back of the brain, the area striata. 6 (See Figure 5-1). Gregory describes the role of the brain in the process of seeing:

Because the eye is physically so like a camera, and because in general we are so used to seeing things without conscious effort, it is difficult to appreciate the enormously complicated processes that must be going on in the brain for vision to be possible. When we 'see' a cup, for instance, a curved image of the cup in perspective is projected unto the retina at the back of the eye and stimulates nerve cells there. What obviously does not happen next is that this effect is transmitted to the part of the brain connected with vision to activate there a region shaped and colored like a cup. And

yet somehow the patterns of light and color at the retina are interpreted so that the brain 'perceives' a solid object existing in external space. More than that, the brain also 'knows', for example, that the eye's view of the rim of the cup as an ellipse would become a circle if the cup were moved over it, and it 'knows', or anticipates, what the cup would feel like, and what sensations one would get if one tried to move it.7

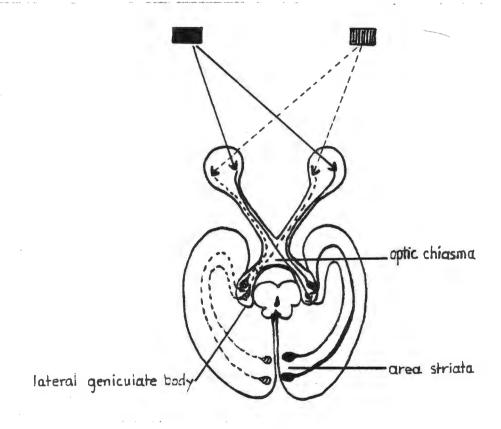


Figure 5-1: The Optic Pathways of the Brain 8

Physiologists are now conceding that indeed vision is more than a simple biological response to visual stimuli. Gregory continues:

"They discovered that patterns at the eye are 'described' by what might be called the internal language of perception. . . . Apparently optical patterns at the eye are broken down into elements and described by combinations of eatures selected by these cells and the nerves connected with them. In much the same way as we might describe an object or a scene in words, so these activated cells present to the brain mechanisms further up the line, features which identify the object as a circle, a house, or whatever. It turns out that the visual brain is organized in many functional layers. As the message that started at the retina passes through these layers, more and more features of the seen object - its colour, characteristics signalled by the other senses, and perhaps associated memory information - are added to the initial pattern as described by its lines of various slopes, its curves and parts which move.9

This process of seeing is a subtle as well as a complex problem solving activity for the brain concerning itself with not only stimuli but perceptions or " . . . hypothesis - as to what object has produced the stimulation of the nerves. . . . When we 'see' things, what we see . . . are hypotheses of what object, or kind of object, stimulated the eye." Our elaborate internal descriptions of objects cannot always solve the impossible problems of uncertainty, ambiguity, and paradox and we are left with perceptual illusions.

Kaufman describes visual perception as a unique and extremely complex process that "goes beyond a mere mental copy or visual imitation to a singularly individual interpretation of what is being perceived, an interpretation that is never absolute. 11

MacPhee also addressed the issue of visual perception: "Consider

the millions of visual stimuli that you receive all the time your eyes are open. To respond to this information you will have to group it in some way." Rowland maintains that the visual stimuli around us, as recorded by our eyes, do not add up to vision; initially they are visual stimuli and no more. It is only when we interpret them that they make sense. Every biological organism is interested in reading the facts of its environment for such reading has survival value. When we put the visual stimuli we receive into a certain order—when we read them—they become shapes and objects; until then they have no meaning. Even though we are born with eyes we have to learn to interpret the visual stimuli on our retinae, we have to learn to see. 13

The foundation of our present knowledge and understanding of visual perception and its relevance to art is derived largely from two sources, the first of which is Structuralism or Association theory. Structuralism refers to perceptual experience as "composed of individual, isolable sensations of light, shade, and colour to which images or memories of prior experiences have been associated. Thus all cues to symbol formations are the results of learned associations that have been formed between particular patterns of visual sensations and particular tactile-kinesthetic memories in the prior history of the individual. More recently, the structuralist assumption that we can, by introspection, identify the elementary components of experience, and that we can observe their casual interaction, has been discarded in psychology. 16

The second and perhaps more fertile source has been that of Gestalt theory. Gestalt psychology evolved as a means of investigating human perception, not as sums of optical data, but as perception of a form according to the laws of grouping, that is, a concept of "the integrated structure of a whole. . . Vision is not a mechanical recording of elements but the grasping of significant structural patterns . . . The appearance of any element depends upon its place and function in the pattern as a whole."

"We group similar things, relating them even though they are separated in space. Gestalt psychology applies principles to this relating, the principles of proximity, similarity, continuity and closure."

The process of looking at the world is "an interplay between properties supplies by the object and the nature of the observing subject."

Gestaltists explicate this interplay between object and observing subject in their "field theory":

Each pattern of light stimulation which falls on the retina of the eye presumably produces a characteristic process in the brain, a process that is organized with overall fields of causation and that changes with each change in the stimulus distribution. Individual sensations are not determined by the stimulation at any point in the visual display (and in fact are not really to be observed in perceptual experience). In order to know what some stimulus pattern (e.g. any picture) will look like, therefore, we have to know how the observer's underlying brain fields will organize themselves in response to that pattern. In general, the brain fields will (presumably) organize themselves in the simplest (most economical) way possible, and knowledge of this fact permits us to predict how any picture willbe perceived . . . particular rules of organization can be extracted: . . . the 'law

of good continuation'; and the 'law of proximity' . . . In short, to Gestalt theory, whether or not cues are learned, they are not arbitrary, nor do they in any sense depend upon memories of past tactile and kinesthetic experiences. What we see depends upon the organizational characteristics of the brain field.²⁰

Today, while the "brain fields" aspect of Gestalt theory is no longer acceptable to perceptual psychology proper, the "laws of organization" still have relevance, particularly for pictorial representations. ²¹

Arnheim, who is probably the chief exponent of Gestalt theory in art, makes a distinction between passive reception and active perception within the visual experience. The retinal projection that is received through the eyes, is a complete and faithful image of the world toward which the eye is turned. But this image is in no way the physical equivalent of what perception contributes to cognition. The retinal projection is merely evidence of awareness of the world. The mental image is evidence of active performance, of perceptual exploration. 23

This eminently active performance is what is truly meant by visual perception. It may refer to a small part of the visual world or the whole visual framework of space, in which all presently seen objects have their location. The world emerging from this perceptual exploration is not immediately given. Some of its aspects build up fast, some slowly, and all of them are subject to combined confirmation, reappraisal, change, completion, correction, deepening of understanding.²⁴

This performance constitutes the process of perceptual differentiation, a discriminatory ability that correlates with maturity. In Arnheim's terms, visual perception,

... is not a passive recording of stimulus material but an active concern of the mind. The sense of sight operates selectively. The perception of shape consists in the application of form categories which can be called visual concepts because of their simplicity and generality.²⁵

Perception involves solving problems of distortion and modification in an active synthesis. Such problem solving occurs in respect to the visual concepts of size, shape, form, brightness and colour.

The size of a retina projection varies . . . with the distance of the physical stimulus object from the boserver. Therefore, as far as the object itself is concerned, the distance dimension distorts the information . . . The same is true for shape. The retinal projection of an object varies depending on its location relative to the observer. There are other such perceptual modifications. The brightness and the colour of an object depend in part on the brightness and colour of the souce illuminating it and on the spatial location of the object relative to light source and observer. 26 To distinguish an object from the afflictions of its appearances is an awe-inspiring cognitive accomplishment . . . The more complex the shape of the object, the harder the perceptual task of extricating it. 27 Visual perception must also cope with both persistence and change. Changes are perceived as mere accidentals of underlying persistent identity. Such transformations require that the senses be intelligent enough to extricate the lasting from the changing and to perceive the immobile as a phase of mobility.28

Thus, in Arnheim's terms, perception of an object is a complicated cognitive accomplishment involving the solution to numerous problems. Referring to what he has termed the intelligence of perception, ²⁹ Arnheim explains:

My intention is that the cognitive operations called thinking are not the privileges of mental processes

above and beyond perception but the essential ingredients of perception itself. I am referring to such operations as active exploration, selection, grasping of essentials, simplification, abstraction, analysis and synthesis, completion, correction, comparison, problem solving, as well as combining, separating, putting into context. operations are not the prerogative of any one mental function; they are the manner in which the minds of both man and animal treat cognitive material at any level. There is no basic difference in this respect between what happens when a person looks at the world directly and when he sits with his eyes closed and 'thinks'. By 'cognitive' I mean all mental operations involved in the receiving, storing and processing of information: sensory perception, memory, thinking, learning. use of the term conflicts with one to which many psychologists are accustomed and which excludes the activity of the senses from cognition. It reflects the distinction I am trying to eliminate; therefore I must extend the meaning to the terms 'cognitive' and 'cognition' to include perception. Similarly, I see no way of withholding the name of 'thinking' from what goes on in perception. thought processes seem to exist that cannot be found to operate, at least in principle, in perception. Visual perception is visual thinking. 30

Thus Arnheim's intelligence of perception implies intelligent behaviour in a sensory area which goes far beyond the mere reception of visual stimuli.

Essential to the Gestalt theory are the laws of organization as noted above. Arnheim alludes to three such principles: simplicity, differentiation, and similarity. The basic law of visual perception deals with parsimony or simplicity. Arnheim offers illustrations to show that " . . . any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as the given conditions permit." Thus, in keeping with the scientific trend of the time, the Gestalt theorists came to the conclusion that every psychological field tends toward the simplest, most balanced, most regular organization available. But there are certain conditions germane to

the operation of the principle of simplicity:

... the tendency to simplest structure in the brain field makes the percept as simple as possible. But the simplicity of the resulting experience depends also upon (a) the simplicity of the stimulus which gives rise to the percept; (b) the simplicity of the meaning to be conveyed by the percept; (c) the relationship between meaning and percept; and (d) the mental set of the individual observer.³³

Secondly there is the law of differentiation which states that "a perceptual feature will be rendered in the simplest possible way as long as it is not yet differentiated"34 This is the process of differentiation which permits a gradual refinement of perception: perceptual development is not due to perception of units which eventually constitute the whole, but to gradual differentiation of previously undifferentiated wholes. Distinguishing between vision and photographic projection, Arnheim claims that vision does not register the complete set of individual detail contained in the retinal image, that perception starts not from particulars but from generalities, from simple over-all structural features, that perception develops from wholes to particulars by means of a process of perceptual differentiation. The processes of perception are given to the organism by nature, and during the course of maturation the perceptual abilities of the child become increasingly more differentiated. The child is thus seeing less than an adult. 35

Throughout the early stages differentiation of shape is accomplished mainly by the addition of self-contained elements. . . . The construction of relatively complex

whole patterns is made possible by the combination of several simple ones. This does not mean that at the early stage the child has no integrated concept of the total object . . . But the analytic method makes it possible for him to deal at every particular moment with a simple shape or direction.

After a while, however, the child begins to fuse several units by common, more differentiated contour. Both the eye and the hand contribute to this development. The eye familiarizes itself with the complex form that results from the combination of elements until it becomes able to conceive on the whole as a unit. 36

Arnheim describes this transition from a combination of constant elements to one internally structured unit or total pattern, as the Gestalt conception of the *integrated whole process* or the "gestalt." ³⁷

Thirdly, there is the law of similarity. Arnheim distinguishes between "perceptual concepts" and "representational concepts": perceptual concepts are the overall structural properties that are grasped in vision while representational concepts refer to the conception of form by which the perceived structure of the object can be represented with the properties of a given medium. Thus representation never produces a replica of an object but its structural equivalent in a given medium. This equation of representation with the equivalent is expressed in the law of similarity. The psychological explanation of the phenomenon is offered by Arnheim:

. . . in human perceiving and thinking similarity is not based on piecemeal identity but on the correspondence of essential structural features; secondly, . . . an unspoiled mind spontaneously understands any given object according to the laws of its context. 39

Representation then demands similarity of stimuli as well as satisfactory context. This similarity of which Arnheim speaks moves recognition of visual form beyond a mere physiological registering of sensory fragments to a process which groups visual units that resemble each other into a spatial pattern that has relevance for the observer. The Gestalt principle of similarity states " . . . the degree to which parts of a pattern resemble each other in some perceptual quality will help determine the degree to which they are seen as belonging together." 40

The person who is perceiving sees relationships between things that share similarities such as colour, size, texture, shape, or any other condition of pattern. The closer the similarities are to one another, the stronger the relationships will be. Consequently, the farther apart that objects or patterns are, the more difficult it is to assess similarities. The person who is perceiving responds to what may be called a continuity of pattern. This quality can also be regarded as closure, suggesting that the perceiver tends to group patterns into some kind of structured order indicating direction, repetition, and the like. The perceiver also tends to group in terms of dominant and subordinate patterns. Kaufman 41 suggests that the principle of similarity requires both an organizing quality as well as certain cognitive factors in order to achieve meaning, and thus some of the basic perceptual patterns may be learned qualities rather than instinctual ones. Kaufman recognizes that

there is a particularly individual anticipation of the form to be perceived that colours the actual act of perception, or what Kaufman refers to as the effects of "memory traces" which have preceded the particular experience.

Arnheim takes exception to the intellectualistic explanation of children's drawings because it substitutes intellectual knowledge for sensory perception.

The oldest - and even now most widespread explanation of children's drawings - is that since children are not drawing what they are assumed to see, some mental activity other than perception is responsible for the modification. It is evident that children limit themselves to representing the overall qualities of objects, such as the straightness of legs, the roundness of a head, the symmetry of the human body. These are facts of generalized knowledge; hence the famous theory according to which "the child draws what he knows rather than what he sees." In substituting intellectual knowledge for sensory perception, the theory follows the kind of thinking that Helmholtz popularized in the 1860's. Helmholtz explained the "constancy" phenomena in perception - that is the fact that we see objects according to their objective size, shape, colour - as the effect of unconscious acts of judgement. According to him, persons obtain a "correct idea" of an object's actual properties through frequent experience; since the actual properties come to overlook their own visual sensations and to replace them unconsciously by what they know to be true. In a similar intellectualistic vein, children's drawings have been described by hundreds of investigators as representations of abstract concepts. 43

This concept assumes a dichotomy between perceiving and knowing that to him

. . . is alien to the perceptual and the artistic processes. It is in the very nature of these processes that every particular act of seeing involves the grasping of overall features - that is, of generalities. Conversely, all visual knowledge, as remote as it may be from any individual percept, requires the concrete realization of certain structural features. The indivisible unity of visual perceiving and visual knowledge is basic [to perception].⁴⁴

According to Arnheim, then, the child draws what he sees. The fact that he draws simplified schemas is not primarily due to limited motor skills but limitations of his perceptual abilities. When the child draws he must transform his perceptions of objects onto a two-dimensional surface. The act of representation is that of creating a structural equivalent of the perceived object, as indicated by the law of similarity. This complicated task requires of the child a good deal of ingenuity.

To work out a better explanation (than the intellectualistic theory) it was necessary: first to revise the conventional psychology of perception; second to become aware of the conditions imposed on artistic representation by the particular medium in which it occurs.

Children and primitives draw generalities and undistorted shapes precisely because they draw what they see. But this is not the whole answer. Unquestionably children see more than they draw. At an age at which they easily tell one person from another and notice the smallest change in a familiar object, their pictures are still quite undifferentiated. The reason must be sought in the process of representation.

In fact, as soon as we apply our revised notion of visual perception, a peculiar difficulty arises. that perception consists in the formation of perceptual concepts, in the grasping of integral features of structure. Thus, seeing the shape of a human head means seeing its roundness. Obviously roundness is not a tangible perceptual thing. It is not materialized in any one head or in any number of heads. There are shapes that represent roundness to perfection, such as circles or spheres. Even these shapes stand for roundness rather than being it, and a head is neither a circle or sphere. In other words, if I want to represent the roundness of an object such as the head, I cannot use the shapes actually given in it but must find or invent a shape that will satisfactorily embody the visual generality 'roundness' in the world of tangible things. If the child makes a circule stand for a head, that circle is not given to him in the object. It is a genuine invention,

an impressive achievement, at which the child arrives only after laborious experimentation.⁴⁵

Thus the act of representation is always the invention of an equivalent and for the child that problem takes on greater proportions because unlike the adult he does not possess a stockpile of previously experienced perceptual inventions.

Lansing interprets Piaget as differing from Gestalt theory on this point. One will recall that Piaget distinguished between perceptual images, representational images, and conceptual schemas. Piaget contends that the perception of Euclidian forms is made possible by perceptual activity or movement by the eyes and hands. Further, he contends that such perceptual movement is as important as, if not more important than, the perceptual images that we retain after the originating experience has passed. While Gestalt theory suggests that our representational or conceptual images are the equivalent of the percept - what we know visually is what we perceive, Piaget contends that we build our conceptual images out of the perceptual image plus perceptual movement and the coordination of perceptual movements. Thus in Piagetian terms, the formation of conceptual or representational images lags behind perception and recognition by a considerable period of time. 46 Piaget and Arnheim use different terminology but may in actuality be describing similar processes inasmuch as Piaget's 'lag' of the conceptual image could be translated into Arnheim's notion of gradual differentiation of the perceptual-conceptual.

The child's ability to represent is achieved in stages of complexity which occur, in part, because children seek higher stages of differentiation as they become dissatisfied with the limitations of the lower ones that allow only ambiguous representation. "Pictorial form grows organically according to definite rules of its own, from the simplest to the more and more complex patterns, in a process of gradual differentiation."47 Early picture making begins by making lines. From his first scribbles he advances to representation of form "with its emphasis on contour." 48 These early forms are circular in nature, the circle preceding "the portraying of specific shape." 49 The circle does not stand for roundness but for "thingness" since, at this stage, shape has not yet been differentiated. From pictures of circles and combinations of circles, the child learns to differentiate shape or direction to create sunbursts with "straight lines or oblongs irradiating from a central circle or combination of concentric circles" that serve to represent many different objects. Representational ambiguity is further lessened by the introduction of first the qualities of straightness and angularity (first to isolated units and later to the total picture space) and later oblique relationships.

In the early stages the child achieves differentiation of shape by the addition of self-contained elements. Gradually the child learns to "fuse several units by a common, more differentiated contour . . . to conceive the whole as a unit." ⁵² In the

same way the child will gradually learn to differentiate size, 53 and distance. 54 Thus the representational abilities of the child are dependent upon a complexity of inventions that develop genetically.

Another factor of perception that one must attend to is the expressive content of form, the fact that the perception of forms evokes in us particular qualities of feeling. Apparently this phenomenon occurs because we have learned to associate that form with other experiences that have particular emotional meaning to us. Gestalt theory, on the other hand, would argue that the form itself possesses an intrinsic character which elicits a particular emotion from the viewer. Figure-ground relationships within a visual field evoke a reaction because of the pattern of light they emit. The pattern itself, taken as a stimulus, is evocative.

... more often than not the situations we face have their own characteristics, which demand to be perceived 'correctly'. The process of looking at the world turned out to be an interplay between properties supplied by the object and the nature of the observing subject. 55

It is through this involvement of the perceiver with the qualities of the object that perception achieves meaning, that art achieves its symbolic content. It is thus that one can experience the symbolic quality of light in a Rembrandt. The expressiveness that a form conveys is an important aspect of its total character but to experience it is, in part, the result of learning to attend to the form appropriately. 56

Only through invention can art be the equivalent or

represent what is in nature. Representation is achieved by employing the perceptual categories of shape and color, location, space and light. Problem solving requires putting these perceptual categories together in various ways in order to achieve such inventions as linear and aerial perspective. When one seeks inventions to represent the wider complexities of space and time, the problems of representation mount higher and higher. The interplay of these perceptual categories creates a visual tension that is essential to expression. 57 It is this expression that is the essence of the dynamic constructive features of perception. Through representation we invent equivalences but as these inventions assume a dynamic quality, they become symbols of meaning as well, thereby adding further to the complexity of representation. This historical nature of invention as required by representation parallels the genetic development of the child's representational abilities.

each of the traditional theories of perception, that is Structuralism or Association theory, and Gestalt theory, and apply these to concepts of artistic learning. From Gestalt theory we know that there are certain processes by which the mind organizes meaning or gestalts. First, a stimulus is presented; ⁵⁸ second, the mind differentiates the stimulus from its surroundings; ⁵⁹ third, the mind focuses on the thing itself, sorting through such phenomena as sets, perceptual vigilance and defense and wish fulfillment, to arrive at meaning; ⁶⁰ fourth, the mind achieves closure

through classification, identification, and possibly naming of the stimulus; and finally attention turns from that stimulus and moves on to something else because the mind will only see as much as is necessary to obtain meaning or closure. 61 Through closure one achieves a holistic perception or gestalt.

processed into such gestalts or meaning, one must attend to such concepts as image fusion, tuneout of constant factors, and most importantly, the formation of figure/ground relationships. (See Figure 5-2). Figure/ground relationships do not exist in the outside world but are created in the mind's selective organization, primarily through the grouping of separate elements such that the stimuli with more immediate meaning receive primary attention to become figure and the tuned out constant stimuli become ground.

Some elements, such as overall patterns of identical or nearly identical units, resist grouping and a satisfactory closure cannot occur. 62 Hochberg emphasizes the importance of continuous contour to good closure:

Now let us see why the Gestalt 'laws or organization' help us to perceive objects correctly, and might therefore be acquired (ontogenetically or phylogenetically in the course of dealing with the world. We have noticed that brightness-difference contours offer our peripheral vision cues to where the edges of objects lie. Of course, not all brightness - changes mark objects' edges, horizons, or corners. Some are caused by shadow, some are due to layers of pigment, etc. There are, however, certain characteristics that tend to distinguish the brightness-differences that are produced by edges and corners. For example, it is very improbable in nature that the edges

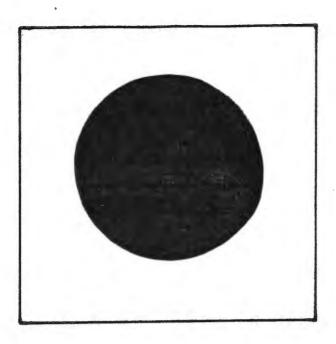


Figure 5-2: A Simple Figure/Ground Relationship

of two surfaces that lie at different distances from the observer will by change be so oriented to his line of sight that they will form a single continuous contour in his visual field. A continuous contour is a good indication of an object's edge. It is not surprising, therefore, that we are very sensitive to discontinuities of contours (Riggs 1965), and that we tend to organize our perceptions in such a way that continuous contours are seen as being the edge or corner of a single surface (law of good continuation)."63

Thus continuous contour may be considered the essence of a good gestalt. (See Figure 5-3).

Fundamentally, perception of the environment is based upon the perception of form. Completely homogeneous surroundings cannot be perceived; they appear vague, indefinite, without location in space. Perception occurs early insofar as some form or pattern arises and is discriminated by virtue of the contour which segregates it from its background. This 'figure-ground' experience is fundamental

fundamental to all perception. According to Rubin 65 certain conditions determine which surface will assume the character of figure in a given pattern: "the enclosed surface tends to become figure whereas the enclosing one will be ground; the smaller area will likely become ground under certain circumstances." Bloomer suggests another set of qualities to distinguish figure and ground: figure dominance is suggested by perceptual brightness, or intensity; figure is perceived as a thing that is on top of a background, ground is perceived as meaningless, having the appearance of being behind the figure, lacking a particular form, and being continuous rather than stopping at the edge of the figure. 66

where the two perceptual elements of the phenomenon are in conflict. Figure/ground relationships sometimes involve alternation of either figure and ground, (Figure 5-5) or of figures, (Figure 5-6). Most psychologists agree that two images cannot be perceived simultaneously, that where the figure and the ground seem to vacillate between two equally good alternatives, the result is ambiguity since the mind experiences an inability to stabilize one meaning as preferable to the other. When attention is concentrated upon a particular point or area of the visual field, the amount that can be perceived is limited. Scanning and search enhance our ability to perceive certain particular aspects of the visual field. When certain information is to be perceived

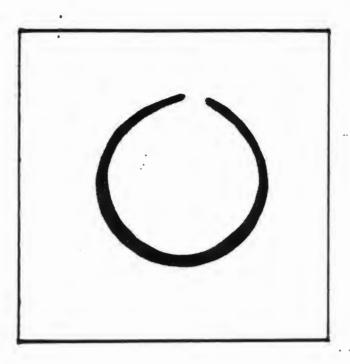


Figure 5-3: Contour as a Factor of Closure
The mind will achieve closure by continuing
the incomplete contour in order to perceive
the simplest form, a circle.

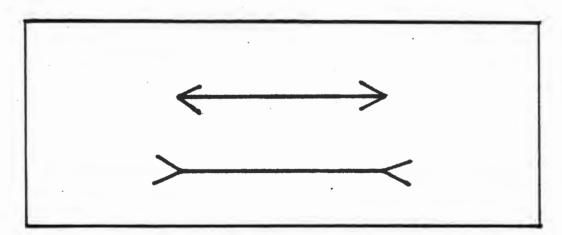
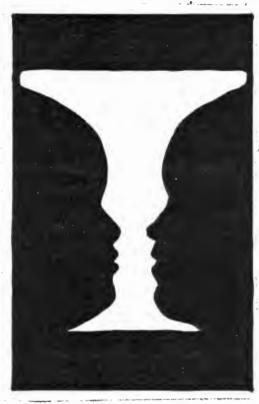


Figure 5-4: Exaggeration



5-5: Alternating Figure/Ground



5-6 Alternating Figure

simultaneously, observers select and process according to the degree of significance. Even so, in certain situations, attention fluctuates between the two aspects of the stimulus material. Since the figures cannot be perceived simultaneously, they alternate, ⁶⁹ one part of the pattern being figure, then becoming subordinate to the other part of the pattern to become ground. Vernon attributes this phenomena to interaction of the formal properties of stimulation as well as to attention based upon the cognitive factors of meaning and interest. ⁷⁰ Rowland insists that "such dual perception has been shown to be possible after all and must be taken seriously" and attributes the phenomena to subliminal vision.

In tests . . . it could be shown from the subjects' graphic reconstruction of what they had seen, that in most cases both profiles had been perceived. Subliminal perception had apparently accomplished what Gestalt perception had balked at.

These experiments went a long way to reveal another mechanism which may supersede Gestalt hypotheses. This alternative mechanism cannot be consciously controlled. But because such subliminal perception may spread over the whole visual field and take in changes in remote parts which it is not even looking at, while Gestalt perception always focuses on a comparatively small area, we have come to understand the role it may play in all creativity. I shall refer to it as unfocused perception. 71

Though Vernon acknowledges the possibility of a truly subliminal perception, he is cautious: "... the existence of truly subliminal perception is still a matter of doubt. But it is not impossible that the focusing of attention on particular aspects of the stimulus and the expectation that certain types of

stimulation may occur, give rise to the identification of stimuli which in other circumstances would be completely ignored. 72 Creative problem solving strategies may, in part, be derived from such a source as subliminal perception, or Rowland's unfocused perception.

Though we are bombarded constantly by visual stimuli, what we actually see tends to center around how the brain transforms or organizes images from the retina. Bloomer claims that the retinal image doesn't change, but the perceptions do. "Seeing is accomplished not in the eye, but in the mind." 73 Thus we tend to see things not as they are, but as the mind thinks they ought to be. Because we have a predisposition to such phenomena as memory traces, selectivity, and subjective influence, not only do we have a tendency to overlook or tune out any irregularities but interfere with our perceptions, but we also correct stimuli in order to facilitate further distortions, as in Figure 3. 74 A similar factor that sometimes affects closure is exaggeration (See Figure 5-4). "Once the mind has perceived certain characteristics in a stimulus, it goes one step further and perceives these characteristics as existing to an even greater extent than they actually do." 75 Similarly when two patterns are seen together, perception of the weaker pattern is distorted in order to maintain an exaggerated perception of the stronger one. 76

Bloomer indicates that closure itself is due to prepatterning. Early Gestalt psychology maintained that the intrinsic character of visual form imposed certain closure patterns on the mind. Bloomer contrasts this emphasis on the structure of the stimulus itself to the more recent emphasis on the structure of the mind which implies that the mind imposes a pattern on the stimulus. The stimulus does not determine the closure: rather, a pre-existing mental category programs how the stimulus will be received. Thus, one sees things only in relation to categories already established in the mind. Rather than objective knowledge about a stimulus, closure represents confirmation of a pre-existent idea. Bloomer supports her view:

Strong evidence supports this view. You are familiar with the Gestalt principle that the mind tends to correct a stimulus to fit the best or simplest interpretation and that the mind tends to see the stimulus as more correct than it actually is. You are aware of the difficulties in proofreading and similar situations. A good explanation for such mental correcting is provided by postulating that the mind bends and distorts the perception of the stimulus in order to satisfactorily classify or fit it into an already established category. To see the stimulus as a familiar gestalt is easier than to construct a new category to account for all the minute details that make the present stimulus different from similar stimuli encountered in the past this is also consistent with the law of simplicity. . . . We can call the preprogrammed responses perceptual prejudices.78

Vernon also acknowledges the fact that such perceptual constancies as expectancy or set strongly affect our perceptions.

Bruner (1957) pointed out that stimulus patterns were identified by classifying them within particular categories of objects or events, and that the classification depended not only on the similarity between the particular stimulus qualities and those characteristic of the category, but also on the relative accessibility of different categories. Moreover accessibility

was a function of the probability which we have learnt to expect for the occurrence of instances of that category. Thus we are more ready to perceive objects or events of a type which we have frequently experienced in the past, and to formulate hypotheses as to the identity of objects in accordance with this experience. However, in particular states of motivation and need, we may deliberately search for relevant objects and events, without taking into account any probabilities, and in such circumstances, perception may be non-veridical." 79

Thus the child may neglect what is more detailed or miss what is qualitatively subtle. The acceptance of Bloomer's theory of "perceptual prejudices" means that one meets a stimulus with a preexisting stereotype, tending to see only those things that reinforce it, tuning out other things that are not consistent with it. The fact that one encounters reality with a number of preconceived ideas has overwhelming implications for art education.

In fact it was to this very end that Rowland proposed his concept of visual education as superseding art education's proprietory claims to perceptual education. Visual education would address perceptual structures across the subject areas:

One of the requirements of the education of our time must therefore be the creation of a structure which will serve percepts in a similar way to that in which language serves concepts: a facility for storing and operating percepts, for building and rebuilding them into different conceptual patterns and constructions for the purpose of thinking and communication.

The aims of the new creative education will not be fulfilled, nor will the needs of our time be served, until education incorporates such a perceptual structure, which is nothing less than a visual language, in its

curricula, so that people may at critical times abandon their static concepts with their attendant routine reactions. It is suggested that this may be brought about through visual education. 81

Thus, by moving a child beyond his perceptual prejudices and the static concepts of a primarily verbal world, one might possibly lay the foundation for a more divergent mode of thought which would encourage delay of closure in order to search for more complex understandings and more creative solutions to problems.

BRAIN THEORY

The original concern was that of improving preadolescent drawing. Thus far, we have established that instruction is an essential feature of art education, that instruction should definitely be provided during preadolescence, and that this instruction should pertain to a wide area of problem solving that makes up the complexity of perception in the artistic experience.

A survey of visual perception has presented a number of concepts that apply to the related problems of the artistic processes. Though it does provide insight into the congnitive-perceptual complexities that appear to be inherent in both perception and the creation of art, it is purely descriptive - it merely tells us what happens. We are still at a loss to hypothesize as to why such happens. There is no indication of whether, or to what extent, instruction might facilitate or hamper a child's artistic development.

At this point, the unknowns would appear to be (1) whether instruction to the end of enhanced visual perception, that is, visual experiences, could alter or improve a child's drawing, (2) what instructional program for these experiences in particular would constitute the instructional program for these experiences, and (3) what explanatory model would suffice for such a program of instruction. The explanatory model envisioned here relates to the perennial tendency of man to graft learning theory on some brain

theory, formerly called epistemology.

Our contemporary explanatory model is best described in Wittrock's terms as "the generative processes of learning." Wittrock gives us some indication of the processes that might be involved in an attempt to explain visual learning:

Learners are not passive recipients of . . . information presented to them. They actively construct their own meanings from the information they are taught . . . Learning and memory are influenced by the sets, intentions, and plans generated in the neocortex of the brain, as well as by the information received from the immediate environment and from internal states, drives and muscular responses. The reality we perceive, feel, see, and hear is influenced by the constructive processes of the brain, as well as by the cues that impinge upon it.²

For the art educator the implication is that we must learn to understand and facilitate these constructive processes in order to take full advantage of them in instructional strategies for art education.

A growing body of evidence, particularly from medicallyoriented research, provokes some interesting hypotheses concerning
the functions of the brain. Since the mid nineteenth century,
patients suffering unilaterial brain lesions (damage to one side
of the brain) showed specific neurological deficiencies.

Specifically, it appeared that damage to the left cerebral
hemisphere produced specific impairment of speech in right handed
subjects, which, in turn, pointed to a major role for the left
hemisphere in speech processing. Because of its association with
the special function of speech, the left side of the brain came

to be considered the dominant or major hemisphere to which was attributed all the higher mental functions. To the right, the minor subordinate hemisphere, was attributed the possibility of preliminary analysis of sensory information and the direction of simple motor sets. But with the "increasing number of reports of specific cognitive deficits following right hemisphere injury" and a change in the prevalent concept of intelligence to emphasize the diversity of cognitive skills, the right hemisphere was attributed dominance on many types of tasks and the concept of dominance came to be replaced by the concept of hemisphere specialization.

Early studies on unilaterally brain damaged patients showed two major classes of cognitive deficits to be more prevalent after right hemispheric damage than after injury to the left hemisphere. These were (1) a difficulty in perceiving, manipulating, and remembering the spatial relationships of objects, both to one another and to the patient himself, and (2) a difficulty in perceiving and remembering visual, tactile, and auditory stimuli which were complex, fragmentary, or hard to label and describe verbally. . . . Spatial disorientation is one of the most dramatic symptoms to follow right hemisphere injury. 6

While such symptoms are not present in all patients with right hemispheric injury, they are much more common than after left hemispheric injury. 7

In addition to comparing groups of unilaterally brain damaged patients, work was also done in the testing of reactions of commissurotomized patients and in experiments with normal patients to compare their abilities in handling stimuli relayed to

the right and left hemispheres. These approaches achieved models of hemispheric processes: 1) a dichotomized encoding model, and 2) a dual information-processing strategy model. In the 1950's neurosurgeons discovered that when a major bundle of nerves connecting the two hemispheres of the brain (called the corpus collosum) was severed in experimental animals, these animals

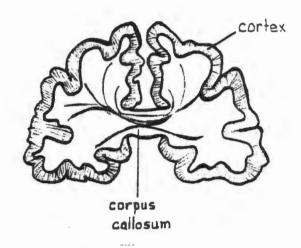


Figure 6-1 Section of the Brain

(Showing the two hemispheres, the cerebral cortex and the corpus callosum)

appeared to have no gross neurological impairments. Similar operations to the callosal nerve fibers of humans showed no obvious effect on temperment, personality, and general intelligence. This raised the question of the purpose of the corpus callosal nerve pathway. The work of R. W. Sperry and his colleagues showed that midline cerebral commissurotomy (cutting of nerve fibers connecting the two sides of the brain) could prevent one side of

the brain from learning what the other side had learned. Further work with these split brain patients "revealed that the left hemisphere was superior in speech, writing and calculation tasks, whereas the right hemisphere appeared superior in the processing and apprehension of visio-spatial relations." Thus it was assumed that the two halves of the brain were specialized in different functions to some extent, and that the principal bundle of nerves connecting the two halves was involved in transferring the information received on one side to the other. It was from these experiments that the concept of the split brain emerged. 10 Levy, Trevarthen, 11 and Sperry presented visual chimeras (right half of one stimulus jointed to the left half of another stimulus) to commissurotomized patients. As long as no verbal transformation was required, the right hemisphere processed the visual stimuli and controlled the contralateral (left) or even the ipsilateral hand in reporting what had been seen. When verbal processes were involved, such as in writing, the right hemisphere showed no comparable control over the motor system. Wittrock concluded that possibly the hemisphere with the most facility or most appropriate strategy controls the voluntary motor system, including on occasion at least, the ipsilaterial muscles. Such studies tended to entrench a dichotomized encoding model.

In the second approach, some researchers question the verbal versus spatial dichotomization of the encoding processes of the brain. Bogen preferred to use the terms "propositional"

to characterize functions left hemisphere, and "appositional" to characterize functions of right hemisphere. 12 Other studies found dual information-processing strategies rather than distinct tasks for each cerebral hemisphere. Luria and Simernitskaya, for example,

questioned the accuracy of characterizing hemispheric encoding functions as either linguistic or perceptual processes. They suggest that language is one example of a conscious, logical coding process that is designed to enhance volitional control of behaviour, the cognitive function of the left hemisphere. The cognitive activities of the right hemisphere they characterized as subconscious, automatic processes not under volitional control . . . It seems that each hemisphere contributes a different strategy, more than a different code, to the encoding task. 13

Various hemispheric dichotomies have been postulated on the differences in the type of perceptual processing employed by the two sides of the brain. They have been described as symbolic vs. visuospatial, associative vs. apperceptive, propositional vs. appositional. "All these classifications imply that the organization and processing of data by the right hemisphere has a predisposition for perceiving the total rather than the parts. By contrast, the left hemisphere is postulated to analyze input sequentially, abstracting out the relevant details and associating these with verbal symbols. Wittrock describes these two strategies with more detail:

One of the most dramatic findings of recent research on the human brain is that, although there is a great deal of overlap and commonality in their functions, its cortical hemispheres characteristically organize and encode information in two different ways. The left cortical hemisphere in about 98 per cent of the right-handers and in about two-thirds of the left-handers specializes somewhat in a propositional, analytic-sequential, time-oriented serial organization well adapted to learning and remembering verbal information. For illustrative purposes, the sequential ordering of the words printed on pages exemplifies an organization characteristic of the left hemisphere. In these same groups of people, the right hemisphere specializes somewhat in an appositional, synthetic-gestalt organization well adapted to processing information in which the parts acquire meaning through their relations with the other parts. An example is the perception and interpretation of a painting or photograph. 15

Further, "Experiments on normal subjects show that the two cerebral hemispheres differ even in their basic means of processing sensory imput." The left hemisphere appears to use a serial process, while the right hemisphere uses a parallel or holistic process, processing all stimuli simultaneously. Another theory of hemispheric specialization suggests that the key factor is the type of stimulus material. The left hemisphere looks after tasks in which the stimuli are familiar, verbal, or easily described or labelled verbally. By contrast, the right hand excels in tasks which involve meaningless shapes, which are too complex or similar to describe or distinguish in words.

To compound the issue even further, there appears to be maturation differences in spatial processing between the sexes, boys showing right hemispheric dominance by age six, girls showing bilateral representation until the age of thirteen. Researchers are also indicating

. . . that the neurological constitutions of men and women lead them to think and behave in different ways.

Their conclusions are based largely on evidence that women's brains are organized differently from men's for certain tasks and functions. There are no agreed-on, observable differences in the physical size, structure, and biochemical components of the brains of the two sexes. However, scientists infer from the performance of the sexes on varied tests that their brains control certain processes in different locations and in different ways. 19

In addition, "McGlone's work supported the idea that a women's verbal and spatial abilities are more likely duplicated on both sides of the brain, while a right-handed man is more likely to have his speech centre on the left, spatial skills on the right." Levy rules out socialization as the determining factor in the differing brain organization of men and women. Similarly, Witelson concluded that "The behavioural differences between the sexes do not increase from childhood to maturity, . . . suggests biological rather than environmental factors as the cause."

The anatomical asymmetry of the brain is one biological factor which, though it apparently has no connection to sex differences, is believed to underlie the functional specialization of the halves of the brain. "The presence of these structural asymmetries from birth suggests that there is a genetic blueprint for them, but it is still unclear whether functional specialization is present at birth or develops as the child matures." Levy believes that "brain specialization does not develop as a child matures, but exists from birth . . . (she) emphasizes however, that while a site of a particular skill may be fixed from birth, learning determines how much that skill develops . . . how well a

person's genetic potential for a given ability is realized depends on practice." A group of Berkley investigators demonstrated that the actual structure and chemistry of brain tissue is affected by a differentiated or "enriched" environment. In a study of rats, they found that "enriched" rats had a heavier cerebral cortex and a greater thickness of cortical tissue. Though the brain changes were concentrated in the visual cortex, visual stimulation was overruled as a contributing factor. 25

On the whole, cerebral lateralization is considered an oversimplified description of a very complex process. The English psychologist, D. E. Broadbent, "concluded that activities localized in one hemisphere cannot be adequately described as 'speech' or 'spatial perception'...'The workings of the brain are much more complex than simple dichotomies will allow.'" of a like mind, Lenneburg stated "... thus far, we know of no behavioural entity that is the exclusive product of just one brain region alone." That is the exclusive product of just one brain region alone. The young child's brain. It is due to this phenomenon that Gainer cautions us against attaching any absolute function to either hemisphere. Teuber indicates some of the nature of this plasticity:

What is clear is that the child is born with a predisposition for language even before its first utterance. The left hemisphere which is the preferred site for representation of speech, appears to develop before the right hemisphere. Before the ages of five to six, damage to the left hemisphere does not

lead to severe impairment of speech during development. It is as if the right hemisphere lags behind in order to take over the lost functions of the left (i.e. with regard to speech and verbal performance). After the age of six, damage to the left side is irreversible. The point is that speech and verbal performance are so important to human development that the brain in its early maturational stages, preferentially develops and protects these functions. Analysis of certain visiospatial patterns (e.g. recognition of faces) does not fully develop until about the age of eight.²⁹

Interpretations tending to rigid dichotomization of the brain tend to be inadequate to cope with the complexity of such findings.

In conclusion, the tendency seems to be to refute the notion of cerebral dominance. While Sperry was able to show autonomous functions when either hemisphere was structurally isolated, the normal brain is not comprised of two absolutely separate entities. Rather, it would seem to enjoy a rather rich sharing process through its cerebral commissures, between two hemispheres which though each may have a predisposition toward certain functions, rather than operating exclusive of the other, are complementary. It seems that hemispheres differ in their strategies, and perhaps somewhat in the type of information they process.

. . . By implication, older notions about universal cerebral dominance do not explain the lateralized cognitive processes of the brain. With the exception of the production of speech, depending upon the type of problem or the appropriate strategy, either hemisphere may dominate the processing, or both may be involved in it. It is more precise to imply hemispheric dominance of a given function, or in a given sense, hemispheric lateralization of a given function, than it is accurate to imply that the same hemisphere is dominant for all functions. 30

As well, either hemisphere may have a tendency toward specialization of some functions.

. . . I wish to emphasize that the cortical hemispheres overlap greatly in ability and function and they are richly connected with each other through the cerebral commissures and other tissues. For example, the right hemisphere comprehends, but cannot produce, speech. The so-called dichotomy between the hemispheric functions probably results from a slight advantage one strategy has over the other strategy, which is sufficient to produce specializations of some functions. As Luria indicates in an excellent summary of the functional organization of the brain, it is hierarchically organized to integrate messages coming from lower sources. The brain also specializes within each hemisphere as well as across hemispheres. 31

All of these positions are highly tentative, as H. L. Teuber points out "the study of the ontogeny of cerebral specialization is only itself in its infancy." 32

A matter so important as cerebral specialization must become a practical consideration for educators. Although there may not be enough firm evidence from brain studies to arrive at specific conclusions for educational procedures, yet there are a great many questions arising from these studies that are concerns of education. One such question concerns the emphasis our whole society has put on processes that are in the main dominated by the left hemisphere. Education must be concerned about the cognitive processes generally attributed to the right or minor hemisphere if only to achieve a balanced development of all cognitive processes. Nebes emphasizes the important strategies attributed to the minor hemisphere:

. . . it probably processes information differently from the left, relying more on imagery than on language,

and by being more synthetic and holistic than analytical and sequential in handling data. It is important in perceiving spatial relationships. It also is probably the neural basis for our ability to take the fragmentary sensory information we receive, and construct from it a coherent concept of the spatial organization of the outside world - a sort of spatial map within which we plan our actions. Further, the minor hemisphere has recently been considered the cradle of creativity, imagination, and ESP.³³

Of particular interest for this study is the synthetic, holistic strategies that Nebes associates with creativity and imagination: this strategy has an exploratory and inventive approach to dealing with what is complex and ambiguous. As for the practical application to the classroom setting, Gainer's caution against rigid hemispheric specialization must be kept in mind. Hut education can take advantage of a considerable amount of data from brain studies without becoming involved in highly technical arguments concerning the precise nature of hemispheric specialization.

Education is a matter of matching instruction to learning strategies.

. . . The process of education should accommodate different styles of learning among individuals and encourage varied perceptual modes in everyone. Psychologists have documented that when children study material from a variety of sensory experiences, they have significantly more information about and knowledge of it than when the material is presented in only one way. That some individuals favour certain patterns of organizing their experiences for understanding over others is also clear.³⁵

Educational approaches could incorporate this information and use the arts to improve basic skills instruction. ³⁶ As the basis for practical application, Wittrock would have education adopt the model of the generative processes of human learning from brain theory. ³⁷ He sees

the basic implication for teachers as a need to understand and to facilitate the constructive processes of the learner. Instructions, which elaborate concepts and issues in different modes or different strategies, "with questions about meanings of subject matter, metaphors, similes, and analogies to induce comparisons, and hypostatizations to represent abstract concepts," provide teachers ways to facilitate the constructive cognitive processes of the brain.

One implication of these findings is that instruction should begin with careful observation of learners, their constructive processes and individual differences. Instructional procedures should then be related to the cognitive processes of learners and their individual differences.

The individual differences . . . emphasizes information processing strategies. Instead of age, sex, and intelligence, the strategies of learners, such as analytic and holistic strategies promise to lead more directly to theoretically interesting instructional procedures. 38

Thus, the appropriate response of education to this early stage, yet highly significant field, of human brain study would be to design curriculum and to sequence instruction according to both analytic and holistic organization. ³⁹ A history of the art of teaching shows it to have always been influenced by a knowledge or belief about the function of the human brain. We agree with Wittrock's conclusion that the cogent influence of brain theory on education today is to direct teaching toward process-oriented paradigms. ⁴⁰

And education of society that tends toward the verbal may not only inhibit the nonverbal processes, but may leave a whole realm of potential undeveloped. Rowland tends to agree:

. . . words often get in the way of original and creative thinking. It used to be assumed that words were necessary for creative thought but more recent realizations confirm the suspicion that creative thought usually emerges in spite of words—and verbalizations—and not because of them. . . .

Words and concept formation, particularly when they intrude too early in any creative process, are now seen increasingly as inhibitors to creativity. It has been suggested that visual models of problem situations, and visual thinking, are often preferable to verbal thinking. The creative individual finds it possible in this way to cut across, or side step, conceptualisation and yet to regain it at will. It is in this field that visual education has a vital task to perform. 41

Brain theory literature indicates that stimulation of holistic processes would have greater potential for divergent thinking than the same stimulation of analytic processes. Rowland speculates not so much on replacing the verbal with visuospatial emphasis, as he does on expanding the range of strategies for the creative effort of problem solving:

Verbal reasoning is liner - it proceeds from point to point, focusing on only a small area of the problem. Furthermore, verbalisation which normally accompanies concept formation, results in loss of perceptual information which may be precisely the information required for the solution of the problem.

It is clear from an examination of the working methods of creative men in all spheres that at some stage of the problem solving process one or more of the elements involved must be conceived not only in its visual form and its usual function but in a dual or ambiguous role, which provides the key to the solution. Words normally fight this duality. Not only do they provide a rough and ready categorisation for experience which discourages closer examination and finer definition, but they may actually distort later perception. Conceptualisation and the labelling with a word have a deep effect on our perception, often distort it and give it a narrow basis for later creative use by eliminating much of its character which may offer alternative interpretations . . it

also seems to inhibit later reference to perceptual data. The user of such verbal labels feels no need to refresh his perception which originally contributed to the concept . . . the use of words and mental sets . . . are necessary for everyday mental operations and make problem solving easier. On the other hand, it is possible to make decisions in unconceptualised terms and it may even be that creative thinking can take place only under these conditions.⁴²

Rowland goes so far as to suggest the possibility of all creative processes being derived from such extra-conceptual qualities. 43

This thesis raised the question whether visual experiences do, indeed, improve a child's representational drawing. To this end is proposed the use of specific modes of instruction which would emphasize nonverbal, holistic, cognitive strategies in order to illustrate their effect on Grade Seven representational drawing.

The teaching experiment developed here to answer this question was constructed as a model derived from the sources of developmental psychology, visual perception, and the generative processes of human learning in brain theory.

AN ECLECTIC MODEL IN PRAXIS

As indicated earlier many art students seem to experience a period of atrophy of both skills and interest at or about the ages of twelve to fourteen. In some instances their creative development appears to stop. They indicate a lack of awareness or aesthetic appreciation. In representational drawings they leave much of the visual information of the stimulus objects unaccounted for and resort to stylization and stereotypes. From the indications of developmental psychology, visual perception, and brain theory it is evident that the complexity of the learning process may require a variety of teaching/learning strategies. The traditional analytic, verbal-oriented mode of instruction may not always be suited to the learner's needs. An eclectic model that is synthetic and holistic in approach and nonverbal oriented was considered as a more appropriate instructional strategy for representational drawing.

PURPOSE

The study sought to compare the effect of two different instructional strategies on the amounts of visual information included in the representational drawings of Grade Seven students. The hypothesis was that perceptual training of a holistic and synthetic nature through nonverbal learning experiences would affect a greater change in children's drawings than would the more verbally oriented traditional drawing activities.

DEFINITIONS

The following are definitions of terms used in the context of this study:

Perceptual training: Instruction intended to develop the ability to observe and respond selectively to visual stimuli, i.e. with the intention of teaching children to see.

Monverbal mode of instruction: Modes of learning requiring neither internal nor external verbalization on the part of the child. For the purposes of this study the nonverbal mode of instruction was comprised of air drawings, contour drawings, and drawings of negative spaces.

<u>Traditional drawing activities</u>: A mode of instruction that primarily involves student responses to teacher questions and directions in order to draw attention to visual stimuli with emphasis on both internal and external verbalization.

Air drawings: A means of exploring visual stimuli and acquiring visual information by using the index finger to "trace" in the air the contours of an object that is before the child.

Contours: The outer edges or boundaries of an object as can be described by a drawing tool. Contours were distinguished from silhouettes in as much as contours could indicate space penetration whereas silhouettes remained two-dimensional.

Contour drawing: A means of exploring visual stimuli and

acquiring visual information by "tracing" an object with one's eye while at the same time drawing the object with a pencil yet never looking at the drawing. Thus the eye and the hand function together as extensions of one another and the eye cannot observe what the hand is doing.

Negative spaces: "Empty" spaces or shapes that are created as a result of positive shapes. They exist over, under and between positive shapes. One example of negative spaces used in this study is the "empty" spaces created by the meeting and overlapping of tree branches.

Visual information: The stimuli received by the eye when looking at an object. The students who received the experimental treatment were encouraged to find visual information along the contours of both positive and negative shapes.

Representational drawing: A mode of responding to visual stimuli that attempts to imitate as closely as possible, or create the illusion of the visual world.

BACKGROUND TO THE STUDY

Although on the whole there would appear to be a paucity of research pertaining to the effects of perceptual training strategies on modes of representational drawing, certain studies such as Salome (1965), Grossman (1970), Salome and Reeves (1972), Salome and Szeto (1975) have indicated a positive correlation between these two factors.

Salome (1965) hypothesized that:

Perceptual training which encourages the child to look for information concentrated along contours of objects or patterns, at points of contour direction change, such as angles, peaks of curvature, and at lines caused by abrupt color changes will increase the amount of visual information a child includes in his drawings.²

Using two different teaching strategies, Salome tested whether

"perceptual training presented in conjunction with drawing
instruction would increase the visual information content of
elementary school children's drawings significantly more than
participation in drawing activities without direct perceptual
training."

From this study Salome concludes that perceptual
training relevant to representational drawing could indeed
increase the amount of visual information fifth grade children
included in their drawings of visual stimuli. Salome suggests
that improved visual perceptions may not be a natural result of
art activities, but "a specific objective for which one must teach."

He speculates further that there may be a need for a sequence of visual training experiences.⁶

From his study Grossman (1970) suggests that "representational drawing skills may be related to a child's perceptual orientation." To this end art instruction should include strategies which are intended to develop the child's ability to observe his environment analytically.

From their study of perceptual training which emphasized locating visual cues along contour lines, Salome and Reeves (1972) conclude that this particular strategy does indeed affect an increase in informational content of five year olds' drawings, and further that perceptual training appears to be the most significant factor in explaining higher performance on particular tests. 10

Working with college-aged students Salome and Szeto (1975) studied the effects of visual search practice and perceptual training (information located along contours) upon the amount of information included in subjects' representational drawing. From this study Salome and Szeto conclude that perceptual training does affect a slight advantage over conventional drawing groups, but since the differences are not large they speculate that "the training effects are more observable when given to children who are in earlier stages of development" than to college aged students.

Edward's 13 study of drawing with college-aged students led her to conclude that some understanding of cognitive strategies is essential to the teaching of drawing. She compared a holistic instructional approach using inverted pictures and emphasizing the drawing of overall configurations and relations among lines and spaces to a more traditional analytic, verbal approach to find that the "fidelity of the drawings" was facilitated by her experimental approach.

Even from this limited amount of research it does appear that the visual perception can be affected by training and that such training increases the amount of visual information included in representational drawings. But what instructional strategies maximize this effect? Which learning experiences in particular will move a child's artistic production from atrophy to growth, promoting him from stereotypes to inclusion of pertinent visual information in his representational drawing?

Arnheim, in the Gestalt tradition, draws our attention to the complexity of visual perception, in as much as perceptual development involves a gradual differentiation of previously undifferentiated wholes into component parts, a complicated analytic task that is a gradual achievement. On the other hand some children must cope with what Arnheim describes as local solution which then become a matter of synthesis in the interests of improved perception. Then it would seem that in order to develop perceptual learning that will allow a child to see what has previously been

unseen or overlooked, instruction must involve both analytic and synthetic strategies.

In addition perceptual constancies such as expection or set impede the perception of certain features of the visual field, causing a child to approach the world with "perceptual prejudices" 16 thereby missing what is detailed or qualitatively subtle. Rowland encourages one to consider what he terms visual education as a means of eliminating the static effects of such perceptual constancies thereby offering a new and creative approach to receiving and responding to visual stimuli. 17 Rowland's emphasis on nonverbal strategies and enriched visual experiences are in sharp contrast to the verbally oriented more traditional art activites. For creative thinking one must advance beyond the words and concepts which inhibit creativity to his unfocused perception 18 which permits extra-conceptual qualities and creative perception. 19 Mere speculation motivates one to wonder whether there is any connection between Rowland's nonverbal strategies for visual education and the more recent findings of brain theorists regarding the various predispositions and strategies of brain functions.

Though there is obvious agreement from the sources quoted that visual training is a necessary factor of art education, one must depend upon developmental psychology to explain why this is so and how this information can be turned to the advantage of art educators in order to alter this preadolescent syndrome of atrophy and apathy.

If one accepts the characteristics of this period as described earlier, 20 then the preadolescent child is vacillating between childhood and adolescence and bears signs of each. On the one hand he wants to learn how to move beyond his own invented schema toward more satisfactory representational skills. On the other hand he is developing as a critic, and thus tends to find fault with his own limited ability. To further complicate his problem his consuming interest in art is now the art product rather than the earlier process. If he evaluates his own work, and falls short because he lacks certain representational skills, then naturally one can expect frustration and the ensuing atrophy and apathy. This need not be the case: instructional strategies which emphasize nonverbal learning and visual experience may nurture extra-conceptual qualities and creative perception which may allow the child to truly see and respond to visual stimuli by including even the qualitatively subtle in his representational drawings.

EXPERIMENTAL PROCEDURES

Subjects: Four classes of Grade Seven art students were divided into two groups. A coin was flipped to determine which would be the experimental and which the control group. The classes were a mixture of boys and girls. They were totally unaware that they were being treated differently or being tested. Student identity and test groups were disguised by use of coded numbers. The drawings of students who had missed any classes as well as those of students who were

"repeating" Grade Seven were eliminated. Although there is the possibility that some children may have received drawing instruction outside of school, none had received any specialist art instruction in elementary school, and prior to this study, no drawing instruction in Grade Seven.

Test Objects: All groups used 2B pencils on 8½ x ll white cartridge paper to produce pretest drawings of a lamp, instructional drawings of a tree, and posttest drawings of a lantern.

Drawing Rating Scale: A three criteria, fifteen point rating scale was used to determine the amount of visual information included in the pre- and posttest drawings. (See Appendix A). The instructional drawings were not evaluated. Three judges, having no knowledge of the nature of the study, independently judged the drawings for the following criteria:

- (1) Space (1 to 5 points), as indicated by such qualities as overlapping, converging or converging/curving lines, positioning on paper.
- (2) Organization (1 to 5 points), as indicated by forms enclosed by line, parts enclosed by lines, interrelation between parts and whole.
- (3) Information (1 to 5 points), inclusion of essential information, inclusion of complementary information, accuracy of information (size, height, proportion, etc.)

TREATMENTS

Two test periods and three instruction periods were used, a period consisting of forty minutes. Each of the experimental and control groups received the same initial lesson of one period duraction which consisted of exloring the use of the pencil as a drawing medium, to achieve both a broad and fine line, and to render value studies ("fog" studies, lines, cross-hatching) and line quality studies. This was followed by the pretest drawing of a lamp, before beginning the two different instructional strategies. All known instructional variables were held constant and only the perceptual training varied.

Control Group: After the media exploration and the pretest drawing the control group was presented with a six foot tree, named Bethilda, as the drawing object. An initial introduction to trees was followed by a discussion of the "treeness" of Bethilda. The children were questioned and directed in order to draw their attention to such qualities as shape, size, proportions, texture, values, attitude of branches, and relation of smaller branches to the whole tree. They were invited to go closer to examine the tree, and to go to the tree as often as necessary while drawing. The children did a short study of a part of the tree that interested them. Finally they were instructed to do a drawing that would show as much about the tree as they could possibly tell

witha pencil, with teacher reference to shape, size, proportion, texture, attitude and line quality. In the next drawing period the children were presented with the posttest drawing object, the lantern, and after a very brief discussion of the qualities of the lantern, shape, size, color, texture, etc. they were simply instructed to draw the lantern, with no further teacher intervention except usual encouragement of individual students.

Experimental Group: After the media exploration and the pretest drawing, the experimental group was presented with the same drawing object, the tree. After an initial introduction to trees in general, the children were asked to look at the tree very carefully, to "trace" it with their eyes. Then they did air drawings of the whole tree. Next they produced several contour studies of the whole tree, never looking at their papers unless they lost their places. This was followed by locating negative spaces on the tree, making air drawings that followed the contours of some of the negative spaces, and then making a drawing of the negative spaces of any one large portion of the tree. Finally the children were instructed to draw the tree with teacher reference to the fact that they might find their skills with values and line quality helpful. In the next drawing period the children were presented with the posttest drawing object, the lantern, and asked to do air drawings and contour drawings of the same. They were asked to include the negative spaces in each of these drawing processes. Then they were asked to draw the lantern with no further teacher intervention except usual encouragement of individual students.

GROUP	x	SD	
Pretest Experimental	19.7	4.05	
Posttest Experimental	26.2	6.31	
Pretest Control	22.9	6.03	
Posttest Control	27.0	6.7	

Figure 7-1: Showing Pretest and Posttest Information for Experimental and Control Groups

From the data obtained it was not possible to prove the original hypothesis due to the circumstance that the two groups were not as equally matched as supposed prior to the experiment. Rather the control group scored significantly higher than the experimental group on the pretest with a t value of 2.68.

Both methods of instruction result in significant gains (Experimental t value 4.79, Control t value 2.61) with no significant difference in performance between the two groups after the posttest (t value .52). However, though the two groups are comparable after instruction, this information may not have such significance as it would appear. Initially the two groups were not comparable, the experimental group scoring significantly lower (\overline{x} value 19.7) than the control group (\overline{x} value 22.9). Thus, in order that the two groups be comparable after instruction, the experimental group made a significantly higher gain than did the control group. The problem

is in ascertaining the cause of this greater gain in the experimental group. Under the circumstances it would be mere speculation to attribute this larger gain to the choice of instructional strategy.

CONCLUSIONS

To conduct a similar experiment again with intact groups it would be practical to pretest and evaluate prior to the experiment in order to achieve more evenly matched groups. Also, it would be advantageous to give more careful consideration to the preparation of the judges by 1) training the judges in order to establish the criteria for evaluation, and 2) ascertaining the correlation coefficient for the judges prior to and during the evaluation.

Although the data obtained cannot be used to prove the original hypothesis, from an observers point of view there are some obvious differences between students exposed to these two treatments and this is most obvious in two situations where 1) children are already fairly competent at drawing and where 2) children are reluctant to attempt drawing. Often when presented with a more difficult problem, in the control treatment the fairly competent child "freezes: and his drawings show a corresponding tightness and smallness in size. When exposed to the experimental treatment, children who are reluctant to draw

appear to forget that they "cannot draw", participate in the learning activities and then move along into the drawing assignments without hesitation. Maybe one value of this treatment is in its potential to move all children out of a state of static and approach problem solving from a different perspective, i.e. as a means of motivating all children to attempt drawing willingly without feeling threatened by a repeated lack of success. The novelty of another instructional approach has been considered as a factor here, as well. Reproductions of some of the pre- and posttest drawings are included in Appendix B in order to illustrate some of the points made in this discussion.

One significant feature of this experiment which would be more closely evaluated in future studies is the changing attitudes of the children themselves toward their involvement in the process of drawing. The experimental group appeared more enthusiastic with each class and eager to continue with drawing classes while the control group indicated a tiredness after the second session and a definite loss of interest when presented with the posttest drawing object. In further studies it would be valuable to record, as empirically as possible, and compare any changes in attitude and relate such information to the original hypothesis. Possibly one matter that should be considered as an extension of this study is the effects of success and failure as factors in motivation and the corresponding effects

on the self esteem of preadolescents. Some of the student's reactions to drawing are recorded in Appendix C. These were recorded following the posttest drawing session.

NOTES

Chapter One: Child Art

- Herbert Read, "Art as a Unifying Principle in Education," Child Art The Beginning of Self-Affirmation, ed. Hilda Present Lewis (Berkeley, California: 1966), p. 17.
- ²Stuart MacDonald, <u>The History and Philosophy of Art Education</u>, (New York: 1970), p. 320.
- Arthur D. Efland, "Changing Views of Children's Artistic Development: Their Impact on Curriculum and Instruction,"
 The Arts, Human Development, and Education, ed. Elliot W. Eisnr (Berkeley, California: 1976), p. 67.
 - 4 Ibid.
 - ⁵Herbert Read, <u>Education Through Art</u> (London: 1943), p. 113
- Elliot W. Eisner, "American Education and the Future of Art Education," Art Education, the Sixty-fourth Yearbook of the National Society for the Study of Education, ed. W. Reid Hastie (Chicago: 1965), pp. 300-302.
- Thomas Munroe, Art Education, Its Philosophy and Psychology (New York: 1956), p. 242.
 - 8Efland, op. cit., p. 69
 - 9<u>Ibid.</u>, pp. 69-70
 - 10 Ibid., p. 70
 - ll Loc. cit.
 - 12 Ibid., p. 72
 - 13 Loc. cit.

NOTES

Chapter Two: Nature or Nurture

- ¹Elliot W. Eisner, Educating Artisitic Vision (New York: 1972) p. 65.
- ²Arthur D. Efland, "Changing Views of Children's Artistic Development: Their Impact on Curriculum and Instruction,"

 The Arts, Human Development, and Education, ed. Elliot W. Eisner (Berkeley, California: 1976), p. 76.
- 3Viktor Lowenfeld, Creative and Mental Growth, 3rd ed. (New York: 1957), p. 5.
 - ⁴Ibid, p. 12.
 - ⁵Ibid., p. 13
 - 6 Ibid., p. 14
 - Herbert Read, Education Through Art (London: 1943), p. 2.
- 8
 Herbert Read, Icon and Idea, (Cambridge, Massachusetts: 1955),
 p. 18.
 - Read, Education Through Art, p. 11
 - 10 Efland, op. cit., pp. 79-80
- Thomas Munroe, Art Education, Its Philosophy and Psychology (New York: 1956), p. 246.
 - 12_{Ibid.}, p. 240
- 13 Kurt Rowland, <u>Visual Education and Beyond</u>, (London: 1976), pp. 15-16.
 - 14_{Ibid.}, p. 13

- 15 Ibid., p. 15.
- 16_{Ibid.}, p. 13
- 17 Jerome S. Bruner, Toward a Theory of Instruction, (Cambridge Massachussetts: 1967), p. 148.
 - 18 Eisner, Educating Artistic Vision, p. 286.
- 19 Viktor D'Amico, "Questions and Answers About Teaching Art," Child Art The Beginnings of Self-Affirmation, ed. Hilda Present Lewis (Berkeley, California: 1966), pp. 103-104.
 - ²⁰Vide supra, p. 14.
 - ²¹Vide supra, p. 14.

Chapter Three: Developmental Processes

Howard Gardner, "Unfolding or Teaching: On the Optimal Training of Artistic Skills," in The Arts, Human Development and Education, ed. by Elliot W. Eisner (Berkley: 1976), pp. 100-101.

²Ibid. p. 101.

- Bruce Joyce and Marsha Weil, Models of Teaching (New Jersey: 1972), p. 183.
 - Garnder, op. cit. p. 101.
- Jean Piaget, The Child's Conception of the World (Totowa, New Jersey: 1969), p. 33.
- Kenneth M. Lansing, "The Research of Jean Piaget and its Implications for Art Education in the Elementary School," Studies in Art Education, VII (September, 1965), 33-34.

Herman T. Epstein, "Growth Spurts during Brain Development: Implications for Educational Policy and Practice," Education and the Brain, Seventy-seventh Yearbook of the National Society for the Study of Education, Part II (Chicago, Illinois: 1978), p. 356.

8_{Ibid}.

⁹<u>Ibid</u>. p. 345.

10 Ibid. p. 350.

11 Ibid. p. 344

12 Ibid. p. 349.

13 Ibid. pp. 350-1.

14 Ibid. p. 351.

15_{Ibid}. pp. 352-3.

16 Ibid. p. 345.

17_{Ibid}. p. 353.

18 Jean Piaget, The Child's Conception of Space (New York: 1956), p. 33.

19 Lansing, op. cit., p. 33.

20_{Ibid.}, p. 34

21 Ibid., p. 35

22 Ibid.

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<sup>24</sup>Ibid., p. 36
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26 Ibid.

27 Ibid., p. 37.

²⁸Ibid., p. 36

29 Ibid.

30 Ibid., p. 37

31 Ibid.

32 Ibid.

33 Ibid.

34 Ibid., p. 40

35 Ibid., p. 41

36 Ibid.

37 Ibid., p. 42

38 Gardner, op. cit., p. 105.

³⁹Ibid., p. 103.

1bid., p. 103. The implications of the symbol are pertinent to Arnheim's notion of an equivalent which will be discussed in Chapter Five. Notable also in this context would be the work of S. Langer.

²⁵ Ibid.

⁴¹ Ibid.

- 42 Ibid.
- 43 Ibid.
- 44 Ibid., p. 104.
- 45 Ibid., p. 106
- 46 Ibid., p. 107
- 47 Ibid.
- 48 Viktor Lowenfeld, Creative and Mental Growth (6th ed.; New York: 1975), p. 275.
 - 49 Ibid., p. 48
 - 50 Ibid.
 - 51 Ibid.
 - 52_{Ibid.}, p. 49
 - 53 Ibid.
 - 54_{Ibid.}, p. 47
 - ⁵⁵Ibid., p. 48
 - 56_{Ibid.}, p. 50
- 57 Elliot Eisner, "What We Know About Children's Art and What We Need to Know" in <u>The Arts, Human Development and Education</u>, ed. by Elliot Eisner (Berkley: 1976), p. 8.
 - 58_{Ibid}.
 - 59 Ibid.
 - 60 Ibid.

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61 Ibid., p. 10.
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62_{Ibid}.

Dale B. Harris, "Comments on Lansing Paper," Studies in Art Education, VII (September, 1965), p. 44.

64 Herbert Read, Education Through Art (London: 1943), p. 119.

65 Eisner, op. cit., p. 12.

66_{Ibid.}, p. 13

67 Gardner, op. cit., p. 107.

68 Ibid., p. 108.

69 Ibid., p. 107.

70
Viktor Lowenfeld, Creative and Mental Growth, 3rd ed.
(New York: 1957), p. 233.

Chapter Four: The Nature of Artistic Learning

Rudolph Arnheim, Art and Visual Perception, (Berkley: 1966), p. viii.

²Elliot Eisner, Educating Artistic Vision (New York: 1972), p. 158.

3 Ibid.

⁴Ibid., p. 195.

⁵<u>Ibid.</u>, p. 160.

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6<u>Ibid.</u>, p. 153
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7 Ibid.

8_{Ibid., p. 263.}

⁹Ibid., p. 195.

10 Vide supra , p. 36.

June King McFee, <u>Preparation for Art</u> (San Francisco: 1961), p. 38.

E. H. Gombrich, Art and Illusion (New York: 1961), pp. 105-109.

13 Eisner, op. cit., pp. 65-6.

14 Ibid., pp. 105-6.

15 Ibid., p. 163.

16 Ibid., p. 98.

17 <u>Ibid</u>., p. 100.

18 Ibid., pp. 101-2.

19 Ibid., p. 102.

20 Ibid., p. 103.

21 Ibid., p. 97.

²²Ibid., p. 83.

23 Ibid., p. 70.

Rowland's emphasis on unfocused perception and extraconceptual qualities as factors of creative perception would seem to have relevance to Eisner's discussion of perceptual meaning. Vide infra., p.

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25 Eisner, op. cit., p. 97.
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Chapter Five: Visual Perception

Elliot Eisner, "Examining Some Myths in Art Education,"
Studies in Art Education, XV (March, 1976), 8.

²⁷ Ibid., p. 105.

²⁹ Ibid.

³¹ Ibid., p. 75.

³² Ibid., p. 100.

^{33&}lt;sub>McFee</sub>, op. cit., p. 205.

^{34 &}lt;u>Eisner</u>, op. cit., p. 105.

^{2&}lt;sub>Ibid</sub>.

³ Ibid.

⁴Ibid.

- 5Rudolph Arnheim, Art and Visual Perception (Berkley: 1966), p. v.
 - ⁶R. L. Gregory, <u>Eye and Brain</u> (New York: 1966), p. 68
 - 7 Ibid., p. 69
- R. L. Gregory, Concepts and Mechanisms of Perception (London: 1974), pp. 614-5.
 - 9 Ibid., p. 615.
 - 10 Ibid., p. 616.
- 11 Irving Kaufman, Art and Education in Contemporary Culture (New York: 1966), pp. 178-9.
- June King McFee, Preparation for Art (San Francisco: 1961), p. 248.
- 13 Kurt Rowland, <u>Visual Education and Beyond</u> (London: 1976), p. 28.
- Julian Hochberg in Art, Perception and Reality ed. by E. H. Gombrich (Baltimore: 1970), p. 52.
 - 15 Ibid., p. 51.
 - 16 Ibid.
 - 17 Arnheim op. cit., p. viii.
 - 18 McFee, op. cit., p. 245.
 - 19 Arnheim, op. cit., p. viii.
 - Hochberg, op. cit., pp. 51-2.

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<sup>21</sup>Ibid., pp. 52-3.
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²² Rudolph Arnheim, <u>Visual Thinking</u> (London: 1970), p. 14.

²³ Ibid.

²⁵ Ibid., p. 37.

³⁰ Ibid., pp. 13-4.

³¹ Ibid., p. 44.

³² Ibid., p. 25.

³³ Arnheim, Art and Visual Perception, p. 50

³⁴ Ibid., p. 170.

³⁵ Ibid., p. 160.

^{36 &}lt;u>Ibid.</u>, pp. 181-2.

³⁷ Ibid., p. 184.

³⁹Ibid., pp. 162-3.

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40 Ibid., p. 67.
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⁴¹ Kaufman, op. cit., p. 187.

⁴²Ibid., p. 185.

⁴³ Arnheim, Art and Visual Perception, p. 157.

⁴⁴ Ibid., p. 159.

⁴⁵ Ibid., pp. 160-1

⁴⁹ Ibid., p. 170.

⁵⁰Ibid., p. 172.

⁵¹ Ibid., p. 182.

⁵²Ibid., p. 185.

⁵³Ibid., p. 188.

Kenneth Lansing, "The Research of Jean Piaget and Its Implications for Art Education in the Elementary School," <u>Studies in Art Education</u>, VII (September, 1965), 35.

⁵⁵ Arnheim, Art and Visual Perception p. viii.

⁵⁶ Elliot Eisner, Educating Artistic Vision (New York: 1972), p. 75.

⁵⁷ Arnheim, Art and Visual Perception, p. 443.

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58 Carolyn M. Bloomer, Principles of Visual Perception (New York: 1976), p. 16.
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59_{Ibid}.

60 Ibid.

61 Ibid.

62 Ibid., p. 41.

63 Hochberg, op. cit., p. 72.

64 M. D. Vernon, <u>Perception through Experience</u> (London: 1970), p. 27.

Arnheim, Art and Visual Perception, p. 220.

66 Bloomer, op. cit., p. 35.

67 Ibid., pp. 36-7.

68 Vernon, op. cit., p. 73.

69 Ibid., p. 89.

70 Ibid., p. 93.

71 Rowland, op. cit., p. 36.

72_{Vernon, op. cit.}, p. 99.

73Bloomer, op. cit., p. 15.

74 Ibid.

⁷⁵<u>Ibid</u>., p. 48.

Thid. It is interesting to relate this factor to a developmental feature that generally occurs between ages four and ten, when children tend to exaggerate in size those objects that are most important to them. Piaget's "centration" refers to this as does Arnheim's "local solutions" (vide supra p. 47). Eisner implies that time is a pertinent factor here since artistic form is organic and whole and to see it requires a perceptual distance that develops slowly, very slowly indeed, since this also is a problem of many adults.

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77 Ibid., p. 49
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Chapter Six: Brain Theory

1 M. C. Wittrock, "Education and the Cognitive Processes of the Brain," Education and the Brain, Seventy-seventh Yearbook for the Study of Education, Part II (Chicago, Illinois: 1978), p. 99.

²<u>Ibid.</u>, pp. 64-5

Robert D. Nebes, "Brain - Right Hemisphere, Man's So-called 'Minor" Hemisphere, "Journal of Learning Disabilities, VIII (December, 1975), 626.

4 Ibid.

5 Ibid.

6 Ibid

⁷Ibid., p. 627.

Ruth Straus Gainer and Harold Gainer, "Educating Both Halves of the Brain: Fact or Fancy," Art Education, XXX (September, 1977), 20.

⁷⁸ Ibid.

⁷⁹ Vernon, op. cit., p. 79.

⁸⁰ Rowland, op. cit., p. 7.

⁸¹ Ibid., p. 81.

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10 Ibid., p. 21
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Daniel Daniel Goleman, "Special Abilities of the Sexes:
Do They Begin in the Brain?" Psychology Today, November, 1978, p. 48.

19 Ibid.

20 Ibid., p. 50.

²¹Ibid., p. 53.

²²Ibid., p. 54.

²³Ibid., pp. 54-5.

24 Ibid., p. 55.

Patricia Wallace, "Brain - Environment and Physiology," Journal of Learning Disabilities, VIII (April, 1975), 27.

26 Gainer, op. cit., p. 21.

27 Ibid.

¹¹ wittrock, op. cit., p. 70.

¹² Ibid., p. 72.

¹³ Ibid., pp. 72-3.

¹⁴ Nebes, op. cit., p. 627.

¹⁵ Wittrock, op. cit., p. 65.

¹⁶ Nebes, op. cit., p. 627.

¹⁷ Ibid.

- 29H. L. Teuber, as cited in Gainer op. cit. p. 22. from the Symposium: Why Do We Have Two Brains: Nature and Origin of Complementary Specialization of Man's Cerebral Hemispheres. Society for Neuroscience, Sixth Annual Meeting, Toronto, Canada, November, 1976.
 - 30 Wittrock, op. cit., p. 68.
 - 31 Ibid., p. 66.
 - 32 Gainer, <u>op. cit.</u>, p. 21.
 - 33 Nebes, op. cit., p. 627.
 - 34 Gainer, op. cit., p. 21.
 - 35 Ibid.
 - 36 Ibid.
 - 37 Wittrock, op. cit., p. 96
 - 38_{Ibid., p. 101.}
 - 39 Ibid.
 - 40 Ibid., p. 63.
- 41 Kurt Rowland, <u>Visual Education and Beyond</u> (London: 1976), pp. 44-5.
 - 42 Ibid., pp 45-6.
 - 43 Ibid., p. 49.

Chapter Seven: An Eclectic Model in Praxis

Vide supra, p. (i).

²R. A. Salome, "The feects of perceptual training upon two-dimensional drawings of children," <u>Studies in Art Education</u>, VII (January, 1965) 21.

3 <u>Ibid.</u>, p. 1.

⁴Ibid., p. 32.

⁵<u>Ibid</u>., p. 33.

⁶<u>Ibid.</u>, p. 32. Rowland proposes sequentially arranged visual experience as a means of achieving his concept of a visual education as opposed to a verbal education, toward an approach to problem solving that encourages greater creativity.

Marvin Grossman, "Perceptual style, creativity, and various drawing abilities," Studies in Art Education, II (February, 1970) 53.

8 Ibid.

9R. A. Salome and D. Reeves, "Two pilot investigations of perceptual training of four-and five-year-old kindergarten children," Studies in Art Education, XIII (February, 1972) 8.

10 Ibid.

Richard A. Salome and Janet W. Szeto, "The effects of search practice and perceptual training upon representational drawing," Studies in Art Education, XVIII (January, 1975) 53.

12 Ibid.

13_{M. C.} Wittrock, "Education and the Cognitive Processes of the Brain," <u>Education and the Brain</u>, Seventy-seventh Yearbook for the Study of Education, Part II (Chicago, Illinois: 1978), p. 98.

- Vide supra, p. 59.
- 15 vide Supra, p. 48
- 16 vide supra, p. 76
- 17 vide supra, p. 77.
- 18 Kurt Rowland, <u>Visual Perception and Beyond</u> (London: 1976), p. 45.
 - 19 Ibid., p. 49
 - 20 Vide supra, Chapter 3.

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APPENDIX A

Evaluation Form For Judging Pre- And Posttests

Number	Unaccept- able		Average		Above
SPACE	1	2	3	4	5
overlapping					
converging/curving lines					
positioning on paper					
ORGANIZATION					,
form enclosed by line					
parts enclosed by line					
Interrelation between parts and whole				,	
INFORMATION					
Inclusion of essential information					
Inclusion of complementary information					
accuracy of information					
(size, height, etc.)					

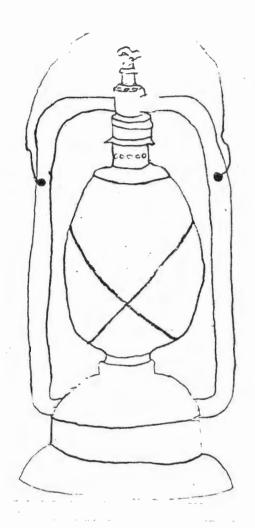
APPENDIX B

A Sampling of the Children's Drawings

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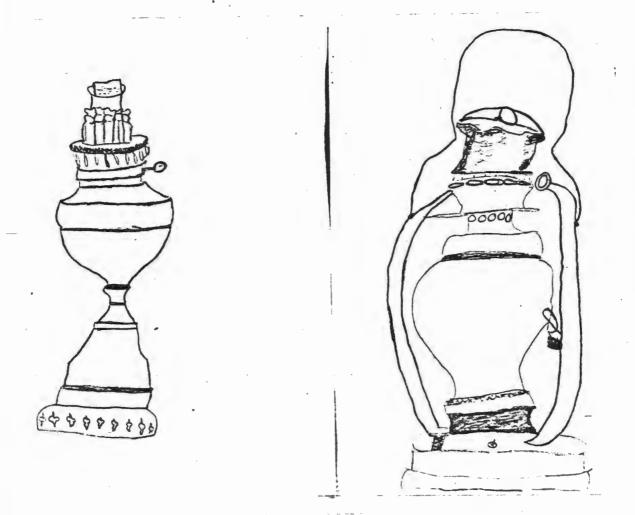
The following reproductions are intended to illustrate particular points that seem pertinent to this study of Grade Seven representational drawing. The do not represent fully the range of drawings produced by either group. Drawings 1 to 8 are samplings from the control group while 9 to 15 are from the experimental group.



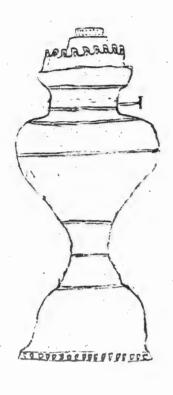


Some students did not advance beyond the pretest stage.

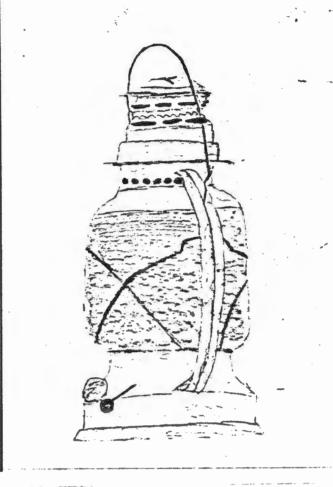
In fact the visual information is less accurate in the posttest drawing than in the pretest.



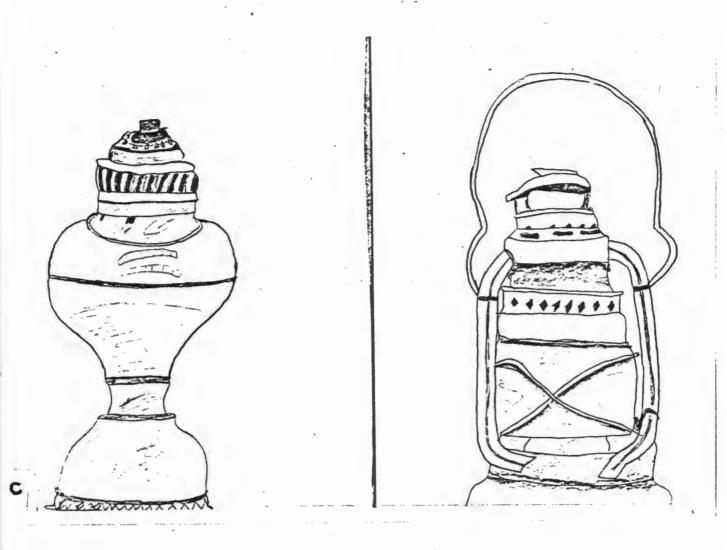
Though there is some attempt to render values in the second drawing, the visual information is less accurate than in the pretest.



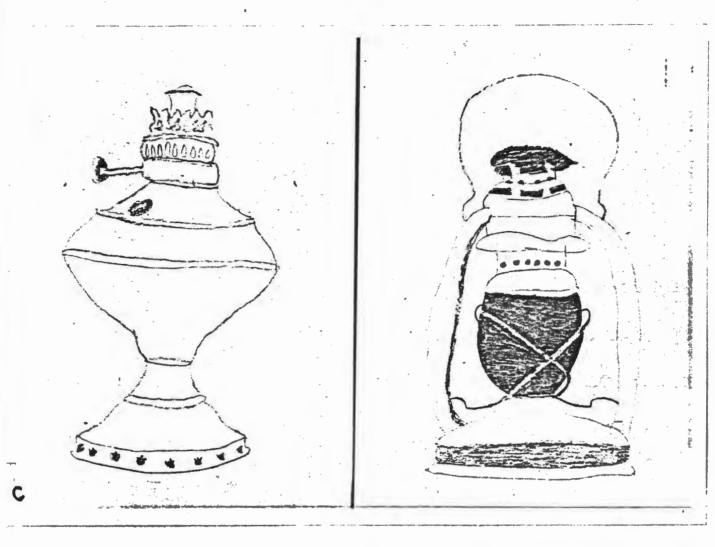
fago



Even though values have been added to the posttest drawing of the lantern, it is less accurate in visual information and thus less convincing than the pretest drawing.

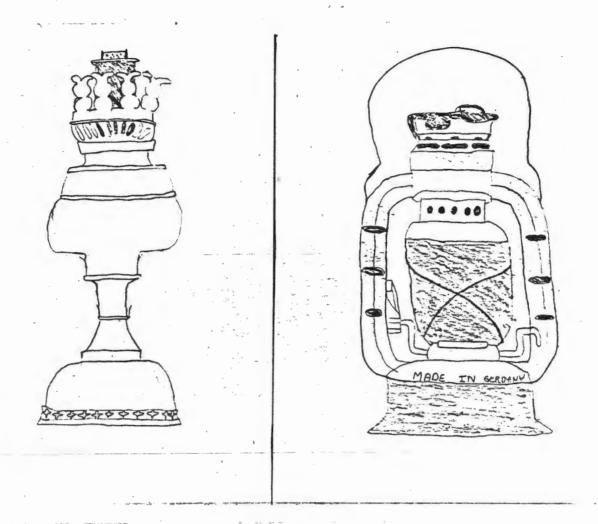


While the essence of the lantern is much better represented than that of the lamp, there is ambiguity due to inaccuracy of visual information.

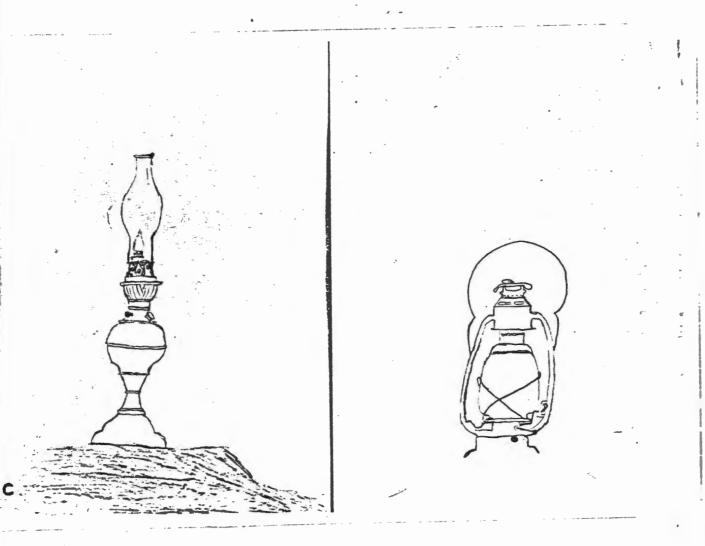


In either case the most prominent features are exaggerated.

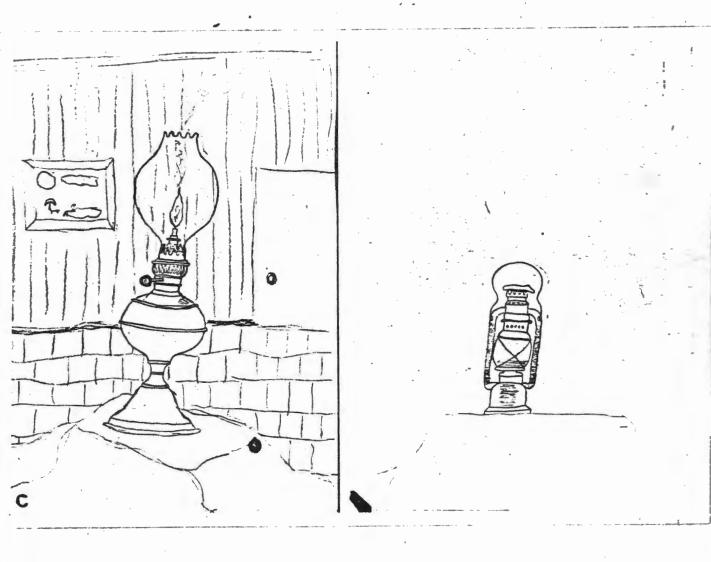
However, the pretest drawing is much more accurate in visual information than the posttest drawing.



Although some of the detail is fairly accurate, particularly in the pretest drawing, the shapes are inaccurate and the posttest drawing shows less of a third dimension than the pretest.

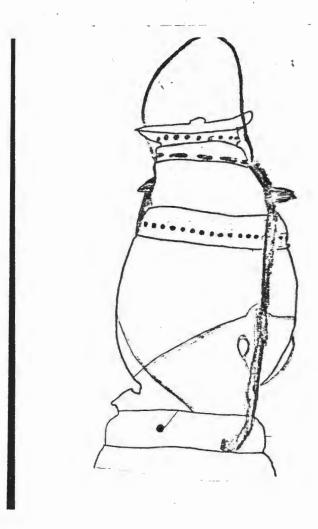


The lamp drawing is very accurate and includes more information than actually presented. The lantern drawing, however, is less developed and less convincing.

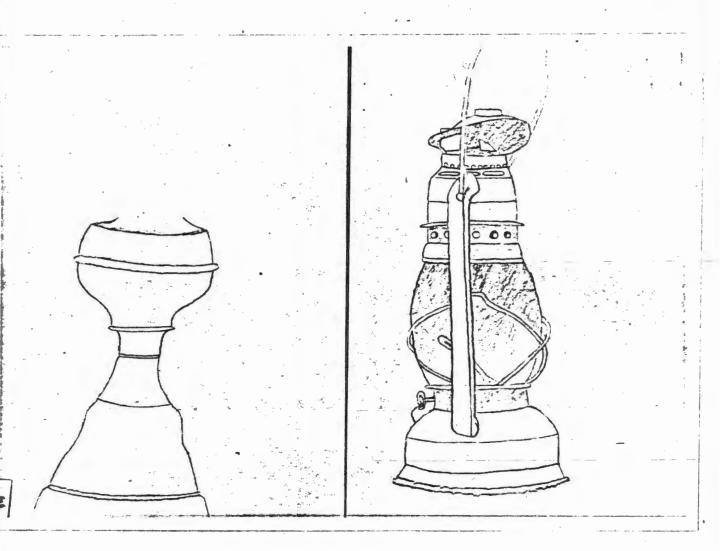


This drawing illustrates further the point being made with illustration 7, inasmuch as the pretest drawing is extremely accurate and includes a great deal of complementary information, while the posttest drawing is small, inaccurate in detail and much less developed, indicating more of a regression of skills development than an advancement.

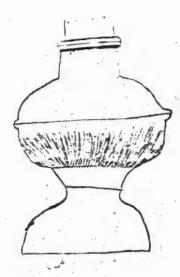


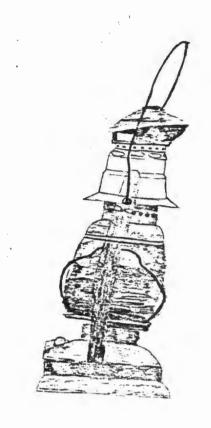


Although this student found the pretest object too difficult to complete, he did attempt to complete the lantern. Incidentally, this is the first completed drawing this child has successfully attempted in Grade Seven.

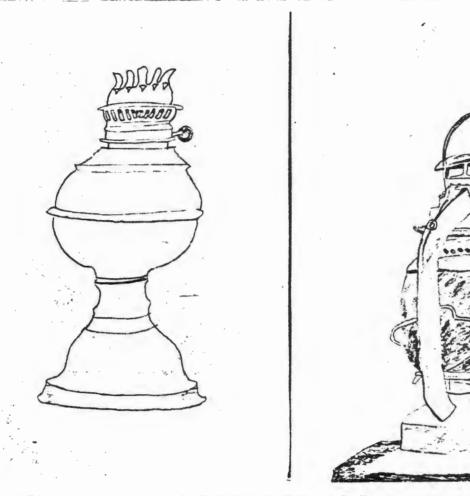


A further example of inability to complete a drawing but in the case of the posttest drawing, this child was significantly more successful than was the case in drawing 9.



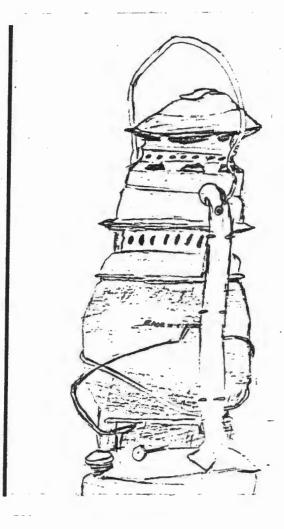


Compared to the completely inaccurate representation of visual information in the lamp drawing, this child shows a remarkable improvement in understanding of the essence of the lantern, including shape, details and dimensions.



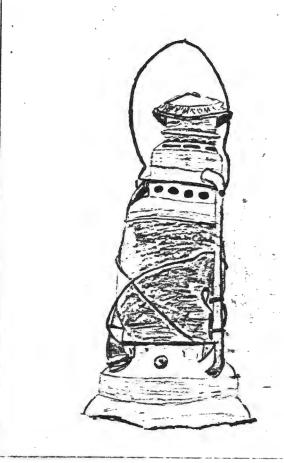
Although the lamp drawing is successful, it lacks certain detail. The lantern drawing includes much more information, especially the indication of the third dimension from a very difficult angle.





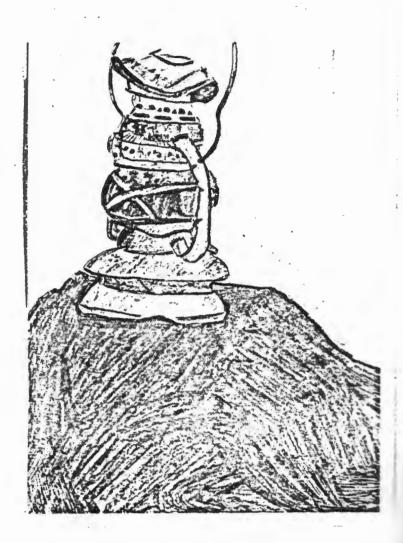
Though lacking some information, most of what is included in the lamp drawing is fairly accurate. By contrast, the lantern drawing is much better and more freely developed, showing greater attention to visual information.





The lamp drawing is accurate in overall shape but lacking certain detail. The lantern drawing, developed with line quality and shading, shows considerable attention to detail and a good deal of accuracy in representing the visual information.





Although the pretest drawing is very successful in accurate representation of information, the posttest drawing shows an even greater awareness of this visual information, with the child attempting to develop the whole picture rather than an isolated part, using both line quality and shading to show values, detail and dimensions.

APPENDIX C

A Sampling of Children's Reactions

The appropriateness of any teaching strategy must take into account the needs of the learner(s). The following candid comments as recorded by the children themselves immediately after the posttest drawings are indicative of the type of reactions made orally in the classroom. While they by no means provide any empirical evidence of their attitudes toward either teaching strategy, they do provide the basis for an intuitive hunch that such information collected empirically would provide another valuable tool for evaluating these different teaching strategies. The following excerpts are quoted unedited except in cases where it was necessary to add or subtract words in order to clarify meaning. It was felt important to include some reactions that do not point to either instructional method but reinforce one's conviction that children of this age do find very personal satisfaction in drawing.

Reactions to Drawings in General:

- What I think about drawing is when I start to draw all my anger or other things inside me out, like if I'm upset I pick up a pencil and just doodle but when I'm finished doodling all my anger and other things inside me are gone.
- I like drawing because it gives you a chance to get the shape or feeling of what you are drawing.
- What I like about drawing is that you can put your feelings on paper, in a picture.
- What I like about drawing is it lets me get my feelings out by putting them on paper.

- I like drawing because it is a way to express your feelings and it is a good passtime. I think drawing can be fun if you really like it.
- I like drawing because there is no special way you have to do it like with small letters or big. It relaxes you when you draw freely.

A Sample of Reactions of the Control Group:

- I like drawing because there's lots of different shapes and sizes but sometimes other things are hard. It's hard getting the lights and darks in but animals and faces are the things I like drawing best.
- Drawing is sort of fun sometimes, but sometimes it is boring because you can't think of what to draw. Drawing is sort of hard too.
- I like drawing because you get to draw things that you have to shade it in.
- Drawing to me is just great for people who can draw.
- I hate it because I can't draw good and the instructions I sometimes don't understand. I don't mind painting but drawing I hate. The drawing classes we had were rotten to me because I can't draw.
- I like art because drawing is fun. Making pictures and other art work is alright but it is hard not to be discouraged when you can't do some things.
- Learning about values and styles was kind of confusing but it helped quite a bit once I figured it out. It is hard trying a figure out when to make thick and thin lines, and when to shade or not.
- It's alright except for some of the things we have to draw.

 I wouldn't mind if there was better things to draw.
- DRAWING IS FUN EXCEPT FOR LANTERNS.
- A method of drawing is just looking at the figure and drawing. I think drawing that way is interesting and fun.

- I feel that drawing is quite fun. I also feel that drawing stinks because I can't get the details in. I like to draw something that is put up on the table and the rest of the class is drawing with me.

A Sampling of Reactions of the Experimental Group:

- I think it helps me draw something at home better. Especially contour drawing. It has helped me a lot in drawing. Sometimes when I don't feel like drawing the technique doesn't help me at all.
- I liked drawing very much because I like drawing and using my hands. I think it helped me a lot. I've learned more in these past weeks than I knew when I started Grade Seven. At first I thought it wouldn't be fun but then I found out it was a lot better if I used what I had learned. I especially liked line values.
- I think what we've been doing in class has helped me. There is no possible way I could ever draw really good but with what we've learned I think I do know more than I did when we first started.
- I don't really like drawing because it is boring. I don't think it helped me in any way. I hate contouring.
- I think drawing is a good hobby and Art Class has helped my drawing a lot. The techniques we have learned have spruced up my drawing.
- It makes drawing objects easier but for drawing other things like animals for example it doesn't work.
- My impression of the technique of drawing is that it was so confusing at first but I've almost got it straightened out. But it's real confused me on drawing a person. I don't know if what we learned has all that much to drawing persons, but if it does I'm confused but otherwise alright.
- It's helped me be better at art. It is easier to draw now. It was the funniest of all art done yet.
- I like to draw but I'm not very good at it. What you have taught us has helped me a lot. This school is the first school that has shown me how to really draw.
- I've felt that I've wanted to be an artist since I was younger

and the technique you have been teaching us is very helpful. I hope that you continue the drawing classes but only make the models harder and not the technique.

- I never was a good drawer although I liked drawing but since you taught us different methods I can draw easier and faster and it seems to look a little sharper. It still doesn't look terrific but I'm pleased with it myself. My work isn't the best but I'm pleased and I hope you are.
- I was a good drawer when I started drawing now I'm better. I really like drawing. I learned how to better show shadows and thickness of objects. I also learned how to show roundness. Contour drawing really helped me.
- I think learning how to draw your way helped me little. I also think that the contour drawings helped me to draw a little also. The air drawings helped me to understand the object more.
- I like drawing but I', not sure if the drawing instructions helped me or not.
- I thank you for teaching the techniques you have taught us. They have really helped me. I drew something last night and it was really improved.