

Basic to Vision is the Concept of the Effector Process

Equally basic is the realization that the covert processes are always precedent to the Overt. The concept of the covert movement pattern is essential to the understanding of any activity, particularly the elaborate Central Nervous Activity that is now labeled "VISION."

Vision is an Emergent from All the Sub-Systems

The efficiency of vision and its effectiveness depends on the effectiveness of the sub-systems. This is particularly true of the covert movement patterns. The overt manifestation is an extremely small part of that operational entity called "reach, grasp and release." Studies of the "reach, grasp and release" totality have been made by the observation of performance in such procedures as "dangled bell." The concept is equally applicable to that over-covert performance known as 'reading.' If the entirety of the reach, grasp and release concept is to be realized, further investigations must be made.

Vision as an Emergent Applies to Any Level Being Considered

It is important to take into consideration the various strata of derivatives being utilized at any moment. Basically, vision, as a meaningful activity, is of necessity a derivative of derivatives, each leading to a higher level. The levels of percept and concept are indicators of these levels. Finally, the ultimate derivative is that of cognition, which leads to the formation of universals. Universals may be considered the most elaborate of the ultimate Summation of derivatives.

To attain a grasp of universals, there must be the precedent development of abstracts. These in turn are dependent on the development of discrete elements that can finally be reduced to the single response to a single sense stimulus. The single stimulus may alert the organism, but alone it is almost meaningless to the organism. This is a description, in reverse, of the process by which man can ultimately think. Also, it is description, in reverse, of the significance of the reach, grasp and release mechanism.

The Documentation of the Physiologic Sequence

Dr. Arnold Gesell noted and described the child seeing a pellet with his eyes before he could pick it up with his fingers, or the earlier palmar groping. The

phenomenal behavior of a child watching the dangle bell procedure reveals reach, grasp, and release on a relatively simple task demand. This phenomenal behavior is now considered to be related to the child's visual maturity. We accept this as probable. There has been less consideration given to the thinking processes that must lie behind the instructional level of the educative process.

Reach, Grasp and Release in Visual Behavior

In visual behavior, the child must be able to reach, visually, for an object in space, grasp it, and release it to be free to reach for another object in space. In the formation of an idea, the child must be able, mentally, to reach for the constituent fragments of an idea, grasp them, assemble them, then release them in order to be free to reach for the next section. This must continue in the development of productive thinking.

A Visual Problem is a Limitation in Learning

This would seem to be why, likewise, a visual problem would be an interference in some level of the reach, grasp and release process. Edith Meyers and Ward Halstead have stressed the fact that these elaborate processes are the most fragile. They are, likewise, the ones for which man is least fitted by his biological inheritance. The elaborated processes have a far greater liability to destructuring of the derivative amalgam by the environmental stresses. This idea would apply to the developing child, the early maturing adult, or the aged.

The Levels of Derivatives

Harmon states that the developing processes are varying levels of derivatives. In fact, the varying levels of reach, grasp and release could be diagrammed in relation to the levels of derivatives. An early level of the reach/ grasp/release entity is the awkward grasping of the hand, directed by the "eye" in conjunction with the total balancing mechanism. The delay in developing the release mechanism is well known. The amount of information stored in the "stream of consciousness" at this level would be very small. The related lattices of experience would be very simple. As the balancing mechanism develops, the overt graspings decrease, the fine movement with the index finger and the opposed thumb become related to the intricacy of the lattices of experience. Eventually, more precise, exact and perfectly

timed performance evolves with the efficiency of the reach, grasp and release processes.

Reach, Grasp and Release in Language

It is not difficult to extrapolate this idea of the reach, grasp, release involved in the fine movements of the index finger and thumb to the evolution of more and more precise use of the structure of the language symbols. Language, with its symbols both spoken and written, provides the transport for the enlarging of the mechanics of the elaborating memory lattice structure. As the organism matures, it can use the configurations of the written or printed word as the tempero-spatial-chemico affinity that sets the stage for the elaborating memory lattices, carries the mechanics of reach, grasp, release into a coordinated process which is wholly covert and within the stream of consciousness, from which it can be externalized as an overt movement quantifiable in the eye itself, as alignment and accommodation.

The Elaboration of the Covert

With further elaboration of the covert patterning, the dependence upon the overt is reduced. Speech and audition take their place in the development or elaboration within the covert patterning, in the stream of consciousness. This is replaced in its ascendancy by the visualization processes, which, in time, becomes independent of all the other derivative processes.

It is at this level of transcendence of all overt processes that the tempero-spatial-chemico affinity processes can be freed from and lose dependence upon, the printed symbols. The organism is lifted by its ultimate powers of elaborations of lattices within the stream of consciousness, is divorced from time and space, and is able to use the reach, grasp and release principles to reach for the elements of an idea, that are within an elaborate experience lattice, can combine it with another lattice in a total grasp, and so increase its ability to Think; then release this to again reach for elements of a further elaborated process. In this way is developed the elaborate reach, grasp and release process in the realm of productive and original thinking.

The Physiological Basis of Reach, Grasp and Release

The growing child must, of necessity, proceed from what he has learned to do with his two hands to the manipulation of what is not within reach of his hands. This manipulative movement is just as truly a part of the overt behavior as the selection of extension and contraction of muscle to control the index finger

and opposed thumb. The extended prehension is part of the slow movement out from himself. From playroom to classroom, the extent of the reach, grasp, release process is broadened and extended so that the person can reach for the chalk, grasp the significance for using the chalk on the chalk board, release from use of chalkboard to use of pencil and paper. This relatively simple process - altho actually of great complication - can be extended to grasping the significance to himself of objects in space, release this, once again to return to the intellectual activities at hand. It has been observed that when a pre-schooler is poor in the reach, grasp and release on the observable overt level, it is possible to predict he will have trouble with symbolism in the classroom. These are both gross reach, grasp and release. When the child is brought to the printed page, the reach, grasp and release process must necessarily be elaborated. When the successive configuration of lines of type are presented, whether it be a letter, or a word, or phrases or sentences, there must be the grasp, which in turn is released to the next reach and grasp and the organism comprehends the significance and then releases it to continue to the next.

Inadequacies of Reach, Grasp and Release

Inadequacies of the reach, grasp and release entity are demonstrable even in such elemental procedures as the developmental drawings. If the child is unable to complete its corners, it is inadequate in reach, grasp and. release. The use of the personal pronoun is not an error. The failure to complete the corners are within the organism. The child who cannot form his letters well has an inadequacy in some of the fundamental properties so essential in the visual process. The process of learning to read is supposed to continue for the first three grades. After that the child is supposed to be prepared to read to learn. Learning to read is really the process of refining the reach, grasp and release complex. The need is to elevate it above the first, second or third level of derivatives so that the organism can combine and recombine the sensory circuiting to where the reach, grasp and release process can operate on the abstract level.

The developing mind begins to relate its own elaborated experience lattices with those of a vicarious organization grasped from a printed page. The ideas of others are conveyed to the reader in such a climate that there is a tempero-spatio-chemico affinity which permits the combining of various lattices of experience, which again can be released. This release makes possible the reaching for more of the vicariously

transmitted experiences. In this way is established the climate for further recombining of experiences when the child has reached the instructional and maturational level that permits him to read to learn. Throughout the whole process, there is a constant and essential process of reach, grasp and release.

From the foregoing, it would seem that reach, grasp and release is vital to the development of the visual process. The baby is strapped to the chair, who "picked up a pellet with his eyes before he did with his fingers" is in the early stages of developing the reach, grasp, release complex. The person in deep thought may have his eyes open yet sees nothing while he is in the process of combining and re-combining the elaborated lattices of experience to produce new ideas. These developed ideas may be conveyed to others of a comparable elaborated reach/grasp/release process. Man can then communicate with man on the level of the development of the reach, grasp and release mechanisms present in each, the communicator and the communicatee.

The Value of the Concept of the Four Circles

Visually, the most primitive organization in the ontogenetic recapitulation of the phylogenetic development is that of alignment and the responses to the pull of gravity. The groundwork of response to gravity must be considered prodromal to the organism's organizing level that will permit the emergence of Vision. When the infant responds to radiant energy for the first time, then the element of Vision has its beginnings. The response to gravity is the basic foundation for the infant's response to radiant energy - or that particular band of radiant energy for which he has specialized receptors in the retina.

The newborn makes its first attempt to align the four quadrants of the retina that there may be an equal light distribution over the total retina. This is the process described by McCullough as "reducing the vector to zero." It is, likewise, the first reach! The first startle response would appear to be the first grasp! The shutting of the small eyes in protest would be the first release! The developing stream of consciousness will shortly permit the reach, grasp and release to take place with the eyes remaining open. A new element is added to the emergent Vision when the infant identifies its mother's breast or the feeding bottle, as well as the various radiant energy modulations throughout the room. In time, as the rapidly myelinating brain organizes its experience lattices, it extends its organization of experience upon experience in the stream of consciousness.

Protopathic Origins of the Reach/Grasp/Release Entity

The very young infant has for its early emergent Vision little more than the integration of the foundational response to gravity and the protopathic alignment responses with the resulting beginnings of centering and identification.

With the growing awareness, comes the first speech-auditory response. The child discovers that the cry of anger brings comfort, dryness and food, out of the space world he is beginning to manipulate. He is reaching with his cry, grasping it with comfort and releasing from it with sleep.

All the elements of the emergent Vision come into aggregation. All the elements are essential, all are necessary, yet none of them ARE the Emergent. However, the Emergent is dependent on the development of all of the elements. The Emergent is that intangible thing with so many meanings that it defies description. If there is an acceptance of Herrick, then actually that Emergent is what has been called Mind. This is acceptable only if there is a subscribing to the statement that "Mind is not something that I HAVE mind is something that I AM."

The development of any of the physiological or neurological processes in any of the sub-systems can be studied in isolation. However, unless there is an understanding of the value to the organism of the integrating of the derivatives of the various contributing modalities of the close energy sequence and their integration with the circuiting of other sensory modalities, then the understanding of the value of each sensory modality in Vision is lost. In each element there is a reach, grasp and release component. It is obvious in the balancing mechanisms with their thrust and counter-thrust; it is present in the speech-auditory circuiting; it is visible in alignment and is implicit in identification. It must be emphasized that, fundamentally, reach, grasp and release has its origin in and its extension within that unknown realm of human behavior, the stream of consciousness.

The overt can reveal operations within the covert. As the reach, grasp and release processes are considered in the stair stepping responses to the dangle bell procedure, or the fumbling thumb and index finger manifestation or the inadequacy of shifting of gaze from near bell to object across the room, there is being investigated externalized overt performances which reveal inadequacies of covert reach, grasp and release processes.

These investigations permit an evaluation of the probable level of performance. They permit the clinician to realize whether grasp is good, reach

adequate or release smooth. These are all elements of the process called Mind. They are controlled by the intangible total organismic process labeled, for lack of a better, the Stream of Consciousness. They are overt manifestations of the magnitudes of experiences. This is true at any age, whether it is the baby who has not learned how to release from the side of the crib or the child who cannot "make a corner" or the college student whose ability to grasp the essentials of a subject are inadequate and who is slow to reach for new meanings, or the adult who is unable to release one idea to reach for another within the timing of his stream of consciousness. Whoever and at whatever age that the individual loses the essence of the vicarious thought or the original idea that would have been his, there is manifestation of the inadequacy of the reach, grasp and release processes, that had they been adequate, he would not have failed to grasp the author's thought or to do the original creative thinking he might have done.

Summation

It would appear from the notions here set forth that reach, grasp and release is vital and essential to the development of the Emergent Vision at any level of experience aggregation. To limit the concept of reach, grasp and release to the overt manifestations would seem to enormously underestimate the universality of the process, entity, sequence or whatever label can be chosen for an essential element of control of any behavior, from the first, elemental reach/grasp/release on exposure to radiant energy, to the thought processes of the original thinker. This understanding of the universal pervasiveness of the reach/grasp/release entity would further or hinder the understanding of the properties of that deterioration from optimal behavior carrying the label of a Visual problem.

Probably it is extending the idea too far, but for a point of emphasis it is allowable, to hypothesize that the magnitude of a visual problem is co-variant with the degree of inadequacy of the reach/grasp/release entity, at whatever level of derivatives the task demand may make its impact on the organized lattices of experience of that individual. Reach, grasp and release being biologically protopathic in origin, and extending the processes throughout the developing organism, are likely to reflect any inadequacies occurring in the earliest stages of biological development, in greater and greater degree as the higher and higher levels of derivatives are affected. It is for this reason that investigation of the reach/grasp/release is so important in all the observable overt behaviors. It is likewise

important that the realization be held that this same process is operating at the highest level of derivatives. It is this idea that gives validity to the optometric idea of enhancement.

On the assumption that a visual problem is a stress induced limitation in the operation of the fundamental reach/grasp/release complex, it "would follow that a visual problem would render less effective the formulation of the congenial climate for memory lattice development. This assumption and the resulting conclusion would hold that a visual problem limits learning. This has been a basic assumption for some time. Further extension of the notion would be that if more economical behaviors were initiated, an improvement in the total complex would follow. On the assumption that learning is essentially the product of more and more elaborated tempero-spatio-chemico lattices, when the impediment to the formation and combining of these memory collocations is either no longer present or has been significantly lessened, learning potentials should be increased.

The gradual development of a visual problem, increasing in effectiveness as the demands of the task increase, would have created a general lowering of the magnitude of learning. This would indicate the need for some sort of an acceleration process, that the person could in effect catch up with the level of total information that would have been his had the visual problem not diminished the ability to elaborate experiential lattices. The probabilities of visual enhancement enters into the consideration of the relation of the total person to any approach or consideration of complete approach to the solution of any existing visual problem.

Enhancement would be a factor at any level of derivatives. It would be valuable in the early protopathic level of the reach/grasp/release complex and would be even more significant in that level of derivatives that permit the "grouping to a criterion" and deriving a generalization. It would be at this level where the work with school children would have its greatest significance.

The most important area of value for the good of the culture and the community as a whole, as well as the individual, would be enhancement on the derivative level of the universal. It is probable that it is on the level wherein the sought-for elimination of the peripheral-covert "verbalizing" takes place. Covert though it may seem, there is a respectable evidence that if the investigatory apparatus is of proper delicacy, overt manifestations of verbalizing can be elicited. However, when the reach/grasp/release of idea formation is in

process, although the tools are there of the symbols of the language, for it is these tools that have permitted the development, the elaboration is such that overt activity is forbidden by the sheer limited speed of neural transmission. The activity becomes, of necessity, wholly covert and the speed of the reach, the grasp and the release are in the realm of astronomic mathematics. To build enhancement of this process is to strive towards the creation of a new dimension of operation in that person. Subscribing to Herrick's definition, one is tempted to speak of "increased freedoms in the operation of mind," or, if that term is objectionable, call it "creative thinking," or, to hold it strictly within optometric terminology, "enhanced visual abilities" and allow the term "enhanced" to be without limitation.

This seemingly irrelevant discussion points to one underlying concept. That at any level of derivatives, the basis of the approach is through the integrity, balance and rhythmic symmetry of the reach/grasp/release

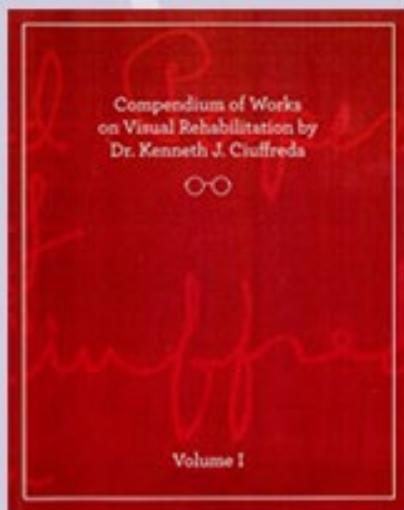
complex. That however elaborated may be the process, it has its foundation in the behavior of the newborn, whose living retina responded and reach/grasp/release was initiated. From that moment on, all the elaborations of the visual process had that same ineluctable factor, the complex known to us as reach, grasp and release.

When the goal is enhancement and the optometrist is thinking of the higher and more complicated processes of the visual emergent, the basis for the establishment of reach, grasp and release on a universal level is based on the effectiveness of the reach, grasp and release on the first, the primary, the overt, the protopathic level.

In summary, to quote Darell Boyd Harmon, "The development of the higher faculties in man does not excuse him from developing a good, sound, physiological operation as a base for them." It is a formula never to be forgotten, from pulling infant to wisdom weighted sage - that the basis of visual operation is a complex of reach, grasp and release.

Compendium of Works on Visual Rehabilitation by Dr. Kenneth J. Ciuffreda

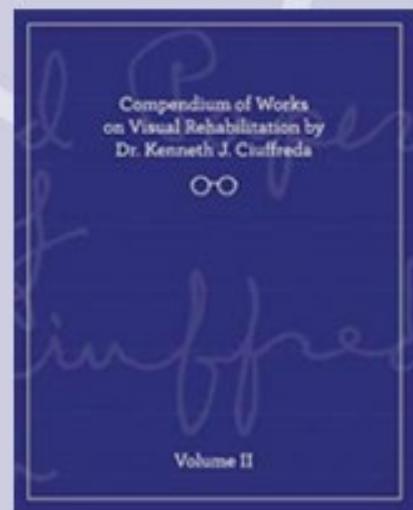
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