DOCUMENT RESUME

ED 053 864 RE 003 619

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TITLE The Modality Concept: Background and Research.
PUB DATE 19 Mar 71
NOTE 11p.; Paper presented at the meeting of the International Reading Association, Atlantic City, N.J., Apr. 19-23, 1971

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS Child Language, Concept Formation, Conference Reports, Historical Reviews, *Learning Modalities, *Learning Processes, *Multisensory Learning, Perception Tests, *Perceptual Development, *Reading Processes, Verbal Development

ABSTRACT

In 1964, the author proposed a multisensory approach to reading, and reading was seen as a language skill related to the development of verbal symbolic behavior. A closer focus was permitted on the child's learning process, which consists of preverbal learning (perceptually automatized and subconsciously acquired) and conceptual learning (which is only accomplished when the child can bend his perceptually processed alphabets to his expressive verbal needs). Further research has indicated that an early development of either auditory or visual perceptual processes leads to early and accurate use of speech or reading, respectively. Research also has shown that as the child develops he appears to use one modality in preference to others in learning, but modality dominance tends to be overcome by most children around the age of 9. In 1969, perceptual process development was clearly defined by Chalfant and Schefflin, and since then a perceptual test battery which seeks to determine the level of development of necessary preverbal skills has been developed. Although the battery is still in an experimental form, sufficient research has been done with it to offer some direct observations. It was concluded that most research studies suggest that slower developing individual modalities is a natural process which should not be confused with other handicaps and that educational programs should be developed to suit the modality preference of the individual child. (AW)

The Modality Concept

Background and Research

by

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March 19, 1971

The work reported herein as published by the Chicago Early Education Research Center a Subcontractor under the National Program on Early Childhood Education of the Central Midwestern Regional Educational Laboratory, a private non-profit corporation supported in part as a regional educational laboratory by funds from the United States Office of Education, Department of Health, Education and Welfare. The opinions expressed in this publication do not necessarily reflect the position or policy of the Office of Education, and no official endorsement by the Office of Education should be inferred.

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Background and Research

International Reading Association - 1971 Annual Convention

In 1955 the theme of the 17th Annual Conference of Reading (H. Robinson, 1955) was "The Oral Aspects of Reading." At that time the act of reading was seen essentially as a visual skill while the auditory component of the total act was relegated to a role in the act of reading aloud. Further analysis of auditory processing during the act of reading, however, gave it increased importance (Wepman, 1955) and by 1964 at the 26th Annual Conference on "Meeting Individual Differences in Reading" (Robinson, 1964) a multi-sensory approach to understanding the learning that must go on in learning to read was proposed (Wepman, 1964).

Within this concept reading was seen as a language skill related to the development of verbal symbolic behavior and not as a separate or unique occurrence. The differential development of sensory

processing ability (auditory, visual and haptic) was presented within a physiological-functional framework bounded by a reflex-perceptual-conceptual hierarchy. Research related to this model of learning based on development was widely reported (Wepman, 1960; Goetzinger, et al, 1960; Prins, 1963) establishing the potential for modality differentiated maturation.

The tendency for children to cluster their best (and their poorest) abilities along one modality or another was noted. This seemed in keeping with the Charcot principle of modality preference (Freud, 1953). Children, especially those at the bottom of distributions of either visual or auditory skills, were found in greater numbers than chance in many groupings of learning or language deficiencies regardless of suspected causal etiology.

Use of the two-way model combining both neurological and functional development at the perceptual and conceptual levels permitted a closer focus on the learning process in children. It brought to attention a perceptual level of behavior not unlike the sensory-motor level postulated by Piaget (1926). Maturation at this level was seen to relate to the capacity to process sensory data to an increasing level of complexity with age through the first eight years of life.

This pre-verbal learning consisted of acquiring the constituent elements necessary for speech and reading, adding to the child's armamentarium the alphabets of sounds and letters needed for a full development of conceptualized verbal behavior. Specifically, the

kinds of knowledge or skills learned at this level were minimally seen (1) to be the capacity to discriminate the sounds of the language and the letters of the alphabet of the language one from the other, (2) to retain these integers in some kind of memory or storage, (3) to be able to retrieve them as needed both in a sense of span and in a useful order; and, (4) to be able to associate them with like perceptual patterns received over other sensory pathways.

Learning to read which, the concept holds, begins at this perceptual automatized, subconsciously acquired level relates to a memory process of its own as well as a motor outlet unrelated to meaning, i.e., it is know that children learn to recall alphabets of letters and sequences of digits without meaning--in an imitative, echoic fashion. In fact, much of their early language acquisition is observably based on their repetition of sounds, their naming of letters and numbers, their repeating of phrases processed by them without reference to present meaning (McNeill, 1970). The environment in fact is called upon to provide the stimuli to which the child reacts at the time of his development when his organism is capable of reacting and he is ready to learn.

Conceptual learning--attaching meaning to what is processed through the sensorium--the act of learning to speak purposively and to read with comprehension can only be accomplished with any degree of facility when the child is able to bend his perceptually processed alphabets to his expressive verbal needs. Thus, whole gestalts, whole ideas may be processed actively without complete

perceptual development. Such behavior is observed as children react to what they hear and see long before they are able to project their own purposive verbal behavior related to it.

As pointed out, the model provided the basis for focussing on pre-verbal learning, this automatic, non-meaningful sensory processing of stimuli. It did more than that--it provided a useful recognition that each modality developed separately, uniquely and at its own rate.

It is useful, in a consideration of sensory modality development, perhaps, to recall some pertinent physiological factors about human organisms. Sinsheimer points some of these out. He notes, for example, that man is neurologically so organized that he has 2 to 3 million neural fibres devoted to sensory processing while only 350,000 fibres have a motor output function (1971). Or, in other words, we can receive so much more information and store it than we can use.

Among these 2-3 million sensory fibres about half are devoted to the cranial nerves (visual, auditory, haptic, etc.) while half are spinal, according to Sinsheimer. He notes that "the principal difference between man and other primates appears to be in the elaboration of structures for the analysis and integration of the sensory input" and "that the differences . . .must derive largely from some elaborations of structure . . .and these innovations (in man) must have arisen through the usual genetic mechanisms (1971).

The child as he develops appears to use one modality in preference to others in his learning. For most children (and for most adults) this means that while all modalities are available to process sensory data one modality-auditory, visual or haptic is dominant. The choice appears not to be conditioned by the environment but seems more likely to be an innate characteristic perhaps through this "usual genetic mechanisms."

Means for exploring this preferential modality and its potential effect on educational practice is a continuing study in our Speech and Language Research Laboratory.

This modality-bound nature of language learning tasks was easily seen after the model directed our attention to the uniqueness in the individual child of his language acquisition patterns. Thus, early development of auditory perceptual processes led to early and accurate use of speech while delayed auditory perceptual development led in most cases to later acquisition of speech accuracy. Early development of visual perceptual processes led to early reading while delays in visual perceptual development led to delays in learning to read.

By 1967 at the 12th Annual IRA Convention, Morency (1968) had reported a positive relationship between auditory discrimination development and reading achievement in the early grades of elementary school. The majority of children studied could and did learn by either visual or aural sensory modality but a significant proportion of children were seen whose individual modalities showed lags in

development making one or the other modality less functional; less useful. Her research also demonstrated that these differences in modality development tended to be overcome by most children by the time they reached their ninth birthdays, except for the rare child who remained apparently quite unable to learn along his poorer pathway. Such clinical cases are rare but when they are found the redirection of training based upon the discovery was found to provide quite dramatic outcomes.

While the attention of most students of modality preference have centered on the development and use of the perceptual level it should be pointed out that in true hierarchical fashion the same channelizing process occurs on the conceptual level. In fact, in all aspects other than in the early stage of learning the bent towards auditory over visual learning and visual over auditory learning is more readily discernible at the higher meaningful level of conceptual and symbolic thought. Clinically, children show marked differences in their capacities as well as their interests along dominant modality lines. The child who can't remember what the teacher told him to do, but who remembers with ease the lesson plan written on the blackboard--or the child who is said to be recalcitrant and stubborn even perhaps deaf because he keeps repeating "what" to everything said to him--when you know he's not suffering from a hearing loss. But most dramatically, the child who just can't learn phonics no matter how hard the teacher tries to teach him but increases in his ability to pick out meaningful words from the printed page.

Having elaborated a perceptual-conceptual hierarchical schema for learning which had strong modality aspects the early prediction of children's propensities for one or another pathway and the subsequent development of guided instruction to maximize the better pathway has become on end in itself.

Perceptual process development was clearly defined by Chalfant and Schefflin's most useful review of research and theory on central processing dysfunctions in children (1969). Since that time, we have worked a Perceptual Test Battery which seeks not only to describe the modality best developed (and perhaps, therefore, the modality of choice or preference) but the level of development of necessary preverbal skills. While the battery is still in an experimental form sufficient research has been done with it to permit direct observations of particular populations. Certain findings from a six-year longitudinal study of 125 children which will be reported in detail later indicates the following:

(1) Perceptual processes such as discrimination, recall, improve with age (Developmental).

(2) The major modalities of learning, visual and auditory, have differential rates of development.

(3) The relationship between the individual visual and auditory subtests and intelligence is positive, but very slightly so.

(4) It is impossible to predict where a child falls on the visual developmental scale from his placement on the auditory developmental scale, and vice versa.

(5) Data from recently completed research "clearly establishes that early perceptual processing ability has a limited but significant predictive value for later school achievement." (Wepman & Morency, 1971)

Certain educational suggestions might be concluded from this and other studies.

(1) It is important to know the modality preference of young children. The knowledge should help one plan an educational pattern in keeping with his preference, especially if the preference is strong and the modalities are widely unbalanced.

(2) Preferential modality concern should be of moment, especially in considering young children beginning to read--as they develop their own unique attack on learning. The teacher should maximize their learning potential by providing sufficient clues in the preferred modality for their easy use and identification. At the same time the teacher should use the lesser, non-preferred pathways for constant support and reinforcement.

(3) Children who are bright adapt to perceptual faults usually by themselves, but when they don't do so naturally, modality-bound instruction should be brought to attention early.

(4) For children having difficulty learning to read, all else being adequate and normal, attacking their remedial problem via their best modality should maximize their chances.

Educators should not confuse slower developing individual modalities with perceptual handicaps, mental retardation, or any other pathological state like severe emotional disturbance or brain injury. Slow development of a specific modality is a natural process in some children. It is important to be aware of it when it occurs so that an educational program can be developed suitable to the individual child. Where the lag is severe and not developing as it should or when the child is over nine, attempts to either offset the undeveloped modality by directed training should be undertaken or failing the success of such remediation assistance in compensation should be tried.

The recognition of modality preference and fostering specific

strong or dominant modality use is not seen as the total answer to why some children fail to learn. It does, however, add distinction and understanding to our knowledge of the over-all problem of learning the child faces. For example, among all children who have emotional problems some will be found who are auditory minded--some more visually oriented. The choice of materials used in teaching such children, it is expected, will tend to be more satisfactory for the purpose if they provide the child with material to which he can relate naturally. The same or similar statement can be made about retarded children. A study of perceptual development and the provision of modality-emphasized material at the child's level will by itself do nothing about relieving the handicap of intellectual deficiency, but it makes working with such children more meaningful from their viewpoint.

Finally, it seems more important for us to know how a child learns than to know how much he has learned. We must continue to study the means by which he learns in order to provide him with proper stimulation for his self-growth. The modality concept with its perceptual-conceptual elements provides us with one way of looking at the maturing child as he learns to learn which after all is what education should be all about.

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