

Research shows that (1) students should be taught through their perceptual strengths from the beginning; (2) students can identify their preferences accurately; and (3) younger children learn better through visual than auditory, and best through tactile-kinesthetic, experiences.

Modalities: An Open Letter to Walter Barbe, Michael Milone, and Raymond Swassing

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We strongly support most of what you have written. Where differences exist, it is important for readers to understand that many of us are exploring an emerging theory based on new knowledge of how children actually absorb and retain information and skills. At this stage, no one is "right" or "wrong"; there are only differences among data that should be examined cooperatively by concerned researchers. It is with that belief that we share alternative findings and perceptions.

1. Your major premise—that it is important to teach students through their perceptual strengths—is so crucial to effective instruction² that you should not diminish its impact by suggesting that teachers should initially lecture to their classes and then use modality based instruction for those youngsters who fail.³ That procedure promotes underachievement and reduced self-esteem for essentially tactual, kinesthetic, or visual pupils. Even when teachers lack the skills for teaching through individual learning styles,⁴ they can respond to perceptual strengths simply by organizing class and homework assignments so that new information is introduced through each youngster's strongest modality and reinforced through the second, and then the third strength.

2. Please identify the research that

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evidences that "personal preference is not very reliable," that "individual judgments will be inconsistent," and that "Few adults and almost no children have a clear picture of the conditions under which they learn best."⁵ Many well-designed and well-conducted studies verify the increased academic achievement that occurs when students are taught through their identified perceptual preferences.⁶

An instrument, such as the Learning Style Inventory (LSI), which incorporates a reported Consistency Score on each respondent reveals the accuracy with which individuals answer its questions. Ohio State University's National Center for Research in Vocational Education published the results of its two-year study of instruments that identify learning style and verified that the LSI has "established impressive reliability and face and construct validity."⁷ That would have been an impossible task if students could not identify their preferences accurately.

3. The contention that primary grade children are more auditory than visual—and learn *least well* kinesthetically—is not supported by the studies you cited. Careful examination of the seven experiments on your chart reveals selected problems in design, control, and interpretation. For example, McKirdy and Rovee (1978), whose subjects were infants, did find signs of response diminution when the total auditory stimulus was removed; the visual reinforcer, how-

ever, was *always in view* and could have negated the findings. The authors themselves recommended a redesign of that aspect of the study. Both Pellerle (1975) and Budoff and Quinlan (1965), required second graders to learn words by either listening or reading. The interpreted auditory superiority could have been the result of the comparative ease with which children can listen before they have learned to read well. *When weighing modality strengths, a subject's ability to remember what has been seen should not be contingent upon reading ability.*

Research clearly has demonstrated that both nonsense words and difficult material are learned more easily through the *visual*, rather than through the auditory, modality.⁸ Thus, Lockhard and Sidowski's presentation of nonsense words to fourth and sixth graders, Von Mondfrans and Travers' experiment with nonsense syllables with adults, and Many's findings that sixth grade students mastered complex learning most easily through the visual modality—all should have been anticipated.

The study by Cooper and Gaeth was incorrectly reported. The dominant modality of the fourth graders was *visual*, but the 12th graders learned better through the *auditory* presentation.

Figure 1 presents eight experiments that verify that younger children learn better through visual and kinesthetic presentations than through auditory.

Montessori's methods are based on observations that indicated that young children learn—and remember—most easily through manipula-

Figure 1. Summary of Selected Modalities/Methods Research¹³

Subjects	Investigators	Compared Modalities* or Methods ⁺	Dominant Modality Reported
Kindergarteners	Waugh (1971)	Visual, Auditory*	Visual
Kindergarteners	Burton (1980)	Visual, Auditory ⁺	Visual
First Graders	Freer (1971)	Visual, Auditory ⁺	Visual
Second Graders	Pulliam (1945)	Visual, Kinesthetic ⁺	Kinesthetic
Second Graders	Otto (1961)	Visual, Auditory, Kinesthetic*	Kinesthetic
Seven Year Olds	Mills (1956)	Visual, Auditory, Kinesthetic ⁺	Visual
Second Graders	Waugh (1971)	Visual, Auditory*	Auditory
Third Graders	Bruininks (1970)	Visual, Auditory ⁺	Visual
Eight Year Olds	Mills (1956)	Visual, Auditory, Kinesthetic ⁺	Kinesthetic
Fourth Graders	Otto (1961)	Visual, Auditory, Kinesthetic*	Visual
Fourth Graders	Cooper and Gaeth (1967)	Visual, Auditory*	Visual
Fifth Graders	Russell (1938)	Visual, Auditory*	Auditory
Twelfth Graders	Cooper and Gaeth (1967)	Visual, Auditory*	Auditory

tive (tactile) and experiential (kinesthetic) activities. Price's study of 3,972 subjects in grades three through seven verified that the younger the child the more tactile/kinesthetic he/she was. Those modalities were followed by the development of visual strengths and, beginning with grades five and six, the development of the ability to remember increasing amounts of information through the auditory modality.⁹ Keefe also reported that, "Perceptual preference seems to evolve for most students from psychomotor (tactile/kinesthetic) to visual and aural as the learner matures."¹⁰

Despite that data, researchers have not begun to examine modality development to the extent that its importance demands. Restak documented the auditory superiority of females over males and that boys tend to be more kinesthetic longer than girls.¹¹ In that regard, note that most studies test primary children for visual or auditory abilities and rarely include tactile/kinesthetic treatments; when they do, "kinesthetic" is usually restricted to tracing over words (which is tactile) rather than to the use of tactile/kinesthetic resources such as task cards, electroboards, learning circles, body games, trips, and "real life" experiences.

The *Review of Educational Research* stipulated "... a lack of investigations into the relationship of the tactile and kinesthetic modalities to the reading process. Without such studies, conclusions drawn with regard to the visual and auditory modalities may be severely limited. . . ."¹² We would not state it better—only more strongly! ■

Editor's Note: Walter Barbe and his colleagues will reply in a future issue of *Educational Leadership*.

¹ Raymond H. Swassing is co-author with Walter Barbe of *Teaching Through Modality Strengths: Concepts and Practices* (Columbus, Ohio: Zaner-Bloser, Inc., 1979).

² Marie Antonetti Carbo, "An Analysis of the Relationships Between the Modality Preferences of Kindergarteners and Selected Reading Treatments as They Affect the Learning of a Basic Sight-Word Vocabulary" (Ed.D. dissertation, St. John's University, 1980).

³ *Teaching Through Modality Strengths . . .*, pp. 58, 62.

⁴ Rita Dunn and Kenneth Dunn, *Teaching Students Through Their Individual Learning Styles: A Practical Approach* (Reston, Va.: Reston Publishing Division of Prentice-Hall Publishers, Inc., 1978).

⁵ *Teaching Through Modality Strengths . . .*, p. 4.

⁶ George Domino, "Interactive Effects of Achievement Orientation and Teaching Styles on Academic Achievement," *ACT Research Report* 39 (1970): 1-9; Beatrice J. Farr, "Individual Differences in Learning: Predicting One's More Effective Learning Modality" (Ph.D. dissertation, Catholic University of America, 1971); Elsie Cafferty, "An Analysis of Student Performance Based Upon the Degree of Match Between the Educational Cognitive Style of the Teacher and the Educational Cognitive Style of the Students" (Ed.D. dissertation, University of Nebraska, 1980); Piedad F. Robertson, "The Implications of Student Learning Styles for Prescribing Reading Skill Development Strategies for Community College Students" (Ed.D. dissertation, Florida Atlantic University, 1977).

⁷ Patricia Kirby, *Cognitive Style, Learning Style, and Transfer Skill Ac-*

quisition (Columbus, Ohio: The Ohio State University National Center for Research in Vocational Education, 1979), pp. 71-74.

⁸ H. Cantril and G. W. Allport, *The Psychology of Radio* (New York: Harper, 1935); Sam Duker, "Listening and Reading," *The Elementary School Journal* 65 (1965): 321-329.

⁹ "Which Learning Style Elements Are Stable and Which Tend to Change?," *Learning Styles Network Newsletter* 1, 3 (Autumn 1980): 1.

¹⁰ James W. Keefe, "School Applications of the Learning Style Concept," in *Student Learning Styles: Diagnosing and Prescribing Programs* (Reston, Va.: National Association of Secondary School Principals, 1979), p. 127.

¹¹ Richard M. Restak, "The Other Difference Between Boys and Girls," in *Student Learning Styles: Diagnosing and Prescribing Programs*, ed. James W. Keefe (Reston, Va.: National Association of Secondary School Principals, 1979), pp. 75-80.

¹² Randall A. Silverston and John W. Deichman, "Sense Modality Research and the Acquisition of Reading Skills," *Review of Educational Research* 45, Winter (1975): 166.

¹³ R. P. Waugh, "The Relationship Between Individual Modality Preference and Performance Under Four Instructional Procedures" (Ph.D. dissertation, University of Oregon, 1971); Elizabeth Burton, "An Analysis of the Interactions of Field/Independence/Dependence and Word Type as They Affect Word Recognition Among Kindergarteners" (Ed.D. dissertation, St. John's University, 1980); Frank J. Freer, "Visual and Auditory Perceptual Modality Differences as Related to Success in First Grade Reading Word Recognition" (Ed.D. dissertation, Rutgers University, 1971); R. A. Pulliam, "Indented Word Cards as a Sensory-Motor Aid in Vocabulary Development," *Peabody Journal of Education* 23 (1945): 38-42; Wayne Otto, "The Acquisition and Retention of Paired Associates by Good, Average, and Poor Readers," *Journal of Educational Psychology* 52, 5 (1961): 241-248; Robert E. Mills, "An Evaluation of Techniques for Teaching Word Recognition," *The Elementary School Journal* 56 (January 1956): 221-225; Robert H. Bruininks, "Teaching Word Recognition to Disadvantaged Boys," *Journal of Learning Disabilities* 3, 1 (January 1970): 28-36; J. C. Cooper, Jr. and J. H. Gaeth, "Interactions of Modality With Age and With Meaningfulness in Verbal Learning," *Journal of Educational Psychology* 58, 1 (1967): 41-44; R. D. Russell, "A Comparison of Two Methods of Learning," *Journal of Educational Research* 18 (1938): 235-239.

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