

# RESEARCH SUPPORT

## On Phonemic Awareness and Phonics:

“Teaching children to manipulate phonemes using letters produced bigger effects than teaching without letters.” (In answer to, “Should we teach phonemic awareness first and only through the ears or utilize the *Zoo-phonics Animal Alphabet* to reinforce phonemic awareness skills?) National Reading Panel, *Alphabets, Part I, Phonemic Awareness Instruction, Reports to Sub-Groups*, page 2-4.

“Phonemic awareness a precursor to phonics, is important to teach from the very beginning...there are high correlations found by others between preschooler’s phonological awareness and later reading skills.” The Alphabet Principal and Learning to Read, by Isabelle Y. Lieberman, Donald Shankweiler and Alvin M. Liberman.

Marilyn Jager Adams states: “low readiness pre-readers can hear the difference between phones as well as a high-readiness pre-reader can. (Cronnell, B.A. 1970) The difference is that the low-readiness pre-readers are simply unprepared to think consciously about the sound structure of words in this way.” Beginning to Read: Thinking and learning About Print.

“Quite apart from anything the teacher does...the student, being human, is a pattern finder, and a pattern maker...” David Bronson (1977).

“It is wise for a teacher to take advantage of the natural inclination to seek patterns when teaching reading.” Frank B. May, *Reading as Communication*, Merrill Publishing Co. (1990).

## On Body Movements and Learning (or, “When the Body Moves, The Brain Remembers.”)

Children learn by touching and doing. Eric Jensen says this: “For younger students, learning has simply got to be hands on, experiential, and relevant for patterns to develop.” Teaching with the Brain in Mind.

“Bodily-Kinesthetic Intelligence is the using of one’s mental ability to coordinate one’s own bodily movements. This intelligence challenges the popular belief that mental and physical activity are unrelated.” Howard Gardner, *Theory of Multiple Intelligences* (1983).

\*Arnold Gesell says, “mind manifests itself in everything the body does.”

\*Jean Piaget reinforced this when he pointed out that “the highest forms of logical intelligence can be traced back to the origins in the body.”

“It may seem ridiculous to say this, but children take their bodies with them wherever they go...As more parents and teachers begin to recognize the ignorance of the body in learning, we’re likely to see a sharp decline in the number of so-called disabled learners.” Thomas Armstrong, Ph.D., In Their Own Way.

\*Piaget and Gesell’s comments are included in this text.

James Asher states this, “My book *Brainswitching* is all about how to use both sides of the brain for

learning, problem solving, counseling, motivation and so on. I can offer you three ideas for persuading the ever-vigilant and blatantly suspicious gatekeeper which is the left brain to swing open a huge cathedral door on the right brain to let information gallop in unimpeded. The first strategy is **body movement**. The student's body is our best ally for transmitting and receiving messages on the first exposure." Brainswitching, A Skill for the 21st Century, James J. Asher.

"Caretakers communicate with the infant when spoken language is uttered to direct physical behavior. We have discovered that the language-body communication also works for students...When the instructor skillfully uses the target language to direct the student's behavior, understanding of the utterance is transparent, often in only one exposure. Also, the understanding is achieved without stress and then retained for weeks, months, and even years." Learning Another Language Through Actions, James J. Asher.

"Most educators know the value of 'crawl time' in developing learning readiness. Yet many of today's children don't get the early motor stimulation needed for basic, much less optimal, school success. Today's infant is 'baby-sat' by television, seated in a walker, or strapped in a car seat for hundreds of precious motor development hours. In 1960 the average 2-year-old spent an estimated 200 hours in a car. Today's 2-year-old has spent an estimated 500 hours in a car seat!...Considering the tomes of evidence on the impact of early motor stimulation on reading, writing, and attentional skills (Ayers 1972, 1991; Hannaford 1995) it is no wonder many children have reading problems."

"The Body Signals, as taught in Zoo-phonics, give access to the brain for decoding in reading and encoding in spelling. When a child is reading and is stuck on a word, s/he gives Sounds and Signals, simultaneously, and then connects them into a word (f-a-s-t = fast). When that same child is practicing the words on the weekly spelling list, each word is put into the brain by means of the Sounds and Signals, and then the letters are connected (qu-i-ck-ly = quickly). Because of the Body Signals, reading and spelling become one and the same process." Georgene E. Bradshaw, 1984.

The Animal Picture Letters and Body Movements act as the perfect instructional and retrieval system. Together, they put new information into the brain, and provide access to that information that is now stored." Charlene A. Wrighton, 1984.

"Contamination occurs when you have too many events or materials embedded in the same location (like months of learning in the same seat, in the same classroom in the same school)...the information is there, but it's nearly useless. This often happens to students who really do know their material but lack the specific "hooks" or mental "file names" to retrieve all their learning...Forgetting occurs because such cues are rarely present when the recall is needed." Eric Jensen, Teaching with the Brain in Mind.

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**A related sidebar:** "An astonishingly high 64 percent of K-12 American students do not participate in a daily physical education program (Brink 1995). In William Greenough's experiments at the University of Illinois, rats who exercised in enriched environments had a greater number of connections among neurons than those who didn't. They also had more capillaries around the brain's neurons than the sedentary rats (Greenough and Anderson 1991). In the same way the exercise shapes up the muscles, heart, lungs, and bones, it also strengthens the basal ganglia, cerebellum, and corpus callosum, all key areas of the brain...aerobic conditioning also has been known to assist in memory (Brink 1995). Researchers James Pollatscheck and Frank Hagen say, "Children engaged in daily physical education show superior motor fitness, academic performance and attitude toward school as compared to their counterparts who do not participate in daily physical education. Brink (1995)

says that physical exercise is still one of the best ways to stimulate the brain and learning. (Kempermann, Kuhn, and Gage 1997). Dustman's research (Michaud and Wild 1991) revealed that among three test groups, the one that had the vigorous aerobic exercise improved short-term memory, reaction time, and creativity. All K-12 students need 30 minutes a day of physical movement to stimulate the brain, says the President's council on fitness and sports. The Vanves and Blanshard projects in Canada revealed something even more dramatic." Eric Jensen, Thinking with the Brain in Mind.

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## On Pictorial Mnemonics

Rohwer (1996) investigated various kinds of associative mnemonics in young children and found that the best connectives for remembering pairs of pictures or words were meaningful "actor-action-object" relations...many other studies confirm that paired-associate learning in children is much improved when learners create or are provided with concrete, meaningful, interactive, and imaginable connections that link the stimulus and response terms in memory. (Davidson & Adams, 1970; Ehri & Rohwer, 1969; Lippman & Shanahan, 1973; Rohwer & Levin, 1968; Rohwer, Lynch, Levin & Suzuki, 1967).

Research also states, "The task of learning letter-sound associations is not an easy one for beginners. Difficulties arise from several sources. The number of associations to be mastered is considerable: more than 40 sounds for 52 visual figures, plus sounds for combinations of letters (i.e., digraphs). Many of the lowercase letters are visually similar and hard to discriminate. The phoneme sounds as well as the visual letter symbols are meaningless. Although the phonemes occur in normal speech, they are difficult to recognize when pronounced alone because their form in isolation is quite different from their form when blended with other sounds. Furthermore, the associations between letters and sounds are totally arbitrary, as there is nothing inherent in the visual symbol that suggests its name or sound...first graders had much trouble learning pairs of arbitrarily associated, meaningless terms. Pictorial Mnemonics for Phonics, Linnea C. Ehri, Nancy D. Deffner, and Lee S. Wilce, *Journal of Educational Psychology*, 1984, Vol. 76, No. 5, 880-893.

"The superiority of the integrated picture group over the disassociated picture group indicates that only one type of picture works, namely, one that links the shape of the letter with the way it sounds." Ehri, Deffner & Wilce, Pictorial Mnemonics for Phonics, *Journal of Education Psychology* (1984).

## On Teaching Lowercase Letters and Letter Sounds First

When teaching reading, Zoo-phonics believes in first teaching the two things that have the most to do with reading – lowercase letters and letter sounds. When a firm base is in place, capitals and letter names are added.

Marilyn Jager Adams says this: "When working with children who have little or no recognition, teachers should not try to teach all 26 letters at the same time."

Beginning to Read: Thinking and Learning About Print, The Reading Research and Education Center, University of Illinois (1990).

"In Zoo-phonics, the children are responding to three things almost simultaneously. They are shown Animal pictures, one at a time, based on the 26 lowercase letters that make up the English alphabet. As they look at each Animal picture, the letter Sound comes through the Animal's name and a Body Signal is given in association with that Animal. Here is an example: "I see a cartoon picture of an

alligator and I reach out my arms in front of me, giving a clap to illustrate an alligator's snapping jaws. At the moment that I clap, I give the letter sound, 'a' for allie alligator." Georgene E. Bradshaw, 1984.

## On Teaching Young Toddlers

"Do today's children get the necessary stimulation for school readiness?" "Not usually," says Lyelle Palmer, professor of special education at Winona State University in Minnesota. "The human brain is the most responsive organ you could imagine. But even with a universe of learning potential awaiting us, we usually don't even get around to doing the basics." (1997). Teaching with the Brain in Mind, by Eric Jensen.

"The brain is fully ready for thinking through tactile learning as early as nine months. ...And some researchers suggest that it is very sophisticated in its learning capacity." (Greenfield 1995). Teaching with the Brain in Mind, by Eric Jensen.

"Children need a flood of information, a banquet, a feast," says neuroscientist Martha Pierson of the Baylor College of Medicine (in Kotulak 1996). Teaching with the Brain in Mind, by Eric Jensen.

Patricia Kuhl of the University of Washington (Begley 1996) says that "...infants develop in their first year a perceptual map of responsive neurons in the auditory cortex. As a result, the brain dedicates special neurons to be receptive to those particular sounds [in their language]...the greater the early vocabulary children are exposed to, the better."

## On Meaning and Relevance and Memory

"When something is meaningful during reading, there's usually more activity (as measured by glucose consumption) in the left frontal, temporal, or parietal lobe," says University of Oregon's Michael Posner. Evidence suggests these factors are likely: relevance, emotions, and context and pattern making. Why and how do emotions engage meaning? Neurobiologist James McGaugh at the University of California at Irvine says that intense emotions trigger the release of the chemicals, adrenaline, norepinephrine, and vasopressin. He adds, "[T]hey signal the brain, 'this is important - keep this'" (Hooper and Teresi 1986.) Eric Jensen, Teaching with the Brain in Mind.

"Semantic [linguistic] learning is inaccessible because the original learning was...too complex, lacked relevance, or sufficient sensory stimulation, or was too "contaminated" with other learning. Our semantic memory lives in the world of words; it's activated by association, similarities, or contrasts. The capacity limitations are more strongly influenced by the strength of associations made than the sheer quantity of items. We remember best in chunks. Our 'working' memory is limited by chunks and is usually good for less than 20 seconds unless rehearsed, reviewed or reactivated. Unfortunately, this type of memory requires strong intrinsic motivation. This [type of learning] is often called 'book learning.' Student frustration and failure increases accordingly each year...at worst, they create discouraged learners who feel unnecessarily incompetent."

## On Brain Overload and Stress

"The traditional way to teach the alphabet is to teach capital letters, lowercase letters, letter names and letter sounds *all at the same time*. This produces two different visual stimuli and two different auditory stimuli for the young brain. So the way one accomplishes this task is to teach only so many letters at a time, or one letter a week. The problem with this is that you now *fragment* the alphabet so

there is no meaning, no continuity. By teaching what is most essential for reading and spelling first (*lowercase letter shapes and sounds of the letters*), through the Animal Letters and the Body Movements, the children quickly learn all the letters in a matter of a few days to a few weeks, AND they know what to do with them! No sensory-overload!"  
Charlene A. Wrighton, 1984.

"While the brain is quite adept at learning, the amount of information criss-crossing our lives today may be a hundred- or thousand-fold compared to what it was just 50 years ago. This virtual avalanche of data can cause us to simply 'shut off' as a coping mechanism. In schools, more classes, more content, and more information to learn can have a negative effect on students' stress from information overload. One solution is to ensure the quality of information, not the quantity. We can do this by purposely orchestrating meaning. A delightful fringe benefit is that the exploration for meaning can be very intrinsically motivating."

### **On Game Format and Memory**

Children stay on task longer when having fun. Delores Dickerson (1982), educational researcher, proved the effectiveness of using the game format as compared to learning from the worksheet approach. She discovered that the passive game approach brought about 30% greater gain than the worksheet approach; the active game approach, a 53% greater gain.

What made the difference?

- Game format provides more time on task (makes it fun...).
- Game format provides instant feedback ("Good job!" "Almost!" "Let's try again.")
- Game format encourages children to work cooperatively.

Delores Dickerson says, "Incorporating games into regular lessons and not as adjunct activities increases the value of the game since its objective reinforces the lessons." Frank B. May, Reading as Communication, Merrill Publishing Co. (1990).

### **On Cooperative Learning**

Zoo-phonics allows for opportunities where the children may work in small groups, where they can talk together and learn from each other and can exercise strengths that might be as yet in the developmental stage.

Howard Gardner states in his Theory of Multiple Intelligences (1983), "Interpersonal relationships are activated by personal encounters in which such things as communication, working together with others for a common goal, and noticing distinctions among persons are necessary and important."

Gardner also states, "When people work together in situations of positive independence, achievement levels are higher, self-esteem and esteem of others is raised, motivation and enjoyment of the task is increased, and creative/higher order thinking processes naturally occur."

"Humans are not born instinctively knowing how to cooperate with others. Therefore, interpersonal and group skills must be explicitly taught and opportunities must be given to practice cooperation."

## Right and Left Hemispheric Learning

“The left side of the brain processes rapid auditory information faster than the right. The skill is critical in separating the sounds of speech into distinct units for comprehension. The left hemisphere, usually responsible for language development, develops slower in the male brain. Thus, males usually develop more language problems than females.” Teaching with the Brain in Mind, by Eric Jensen.

“Because males develop language skills at a later point in life than females, Zoo-phonics, because of its concrete, right hemispheric approach, learn to read, spell and write just as quickly as females.” Charlene A. Wrighton, 1984.