workbooks before really need this step. This is essential instruction—which is often skipped by teachers—to save time—and then later they're disappointed when kids don't know how to answer questions on their own.

So first check and/or fix all of these eight things. If the children were still unsuccessful at the workbooks, although you couldn't say they were "too young," you could say they lacked the needed prerequisite skills to do *RM III*. Of course, as you can imagine, this is about as likely as Ken Goodman endorsing DI, but, hey, it could happen. ADI

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ZIG ENGELMANN

Response to Time *Magazine's Report on Dyslexia*

There are lots of problems with the quasi-scientific analysis of dyslexia reported in *Time*, titled, "The New Science of Dyslexia." Basically what they discovered using MRIs was that the problem was not "visual," but associated with language. From this information, they launched into a daisy chain of inferences, none of which are very sensible because they still believe in dyslexia. Here's the major problem with the analysis: If it's true that students in places like the worst slums in Baltimore and rural Mississippi taught with DI have 100% of the children reading—not guessing or memorizing—by the end of kindergarten, something is seriously wrong with the portrait of dyslexia. After all, these students exhibit all of the "warning signs" referred to in the analysis. When they come into kindergarten, they can't rhyme, they can't alliterate, they can't blend orally presented words, and they have lots of problems figuring out unique sound patterns (such as repeating something like 4, 4, 4, 4 and yet are able to repeat four or more random digits). So they should all be dyslexic, and indeed historical performance records show that virtually all of them had been greatly retarded in reading, with the average fifth grader stumbling about on a weak second-grade level. Some of the schools that currently have no nonreaders coming out of K historically had end-of-first-graders scoring at the 6–9th percentile on standardized achievement tests. Yet, the new science tells us that we can expect 1/5 of the population to have dyslexia. That's a 20% failure rate to teach reading in a fat-cat suburb where parents care about and influence the schools, and where they are lavishly funded with aides, material, and whatever.

The second major problem has to do with their data on early intervention and what works. Shaywitz asserts, "The data we have don't show any one program that is head and shoulders above the rest." Obviously, Shaywitz needs more accurate and extensive data, like that from City Springs where the average/median first grader in 2003 scored at the 99th percentile on achievement tests. And fifth graders reach the 87th, making City Springs the number one school in reading in Baltimore in both the first and fifth grades. It certainly couldn't be because City Springs has 99% blacks and over 90% free lunch, or because 6 years ago it was the 117th school in a district of 117 schools, or that the kids scored below the 10th percentile in reading and math in all grades, or because not one student in Grade 3 or Grade 5 passed the Maryland state reading test. What then caused this amazing change—the water, a prayer campaign, or some form of multi-vitamin diet?

More to the point, because this kind of improvement has only been achieved by Direct Instruction, and because it has been done in more than one school, and in fact, in any school that implements according to the numbers, there does seem to be one program that is head and shoulders above the others.

Stated differently, I'll bet the authors of the new science of dyslexia, and Shaywitz $100,000 that they can't produce one 5-year-old child who is prejudged to be in the normal IQ range that can't be taught to read in a timely manner. They can submit as many as 100 virgins (kids who have not been screwed by learning that Obuh is for baby). These folks can use whatever screening methods they seem to think predicts "dyslexia." I'm dead serious about this bet.

Third, and perhaps most relevant, the neurological evidence sucks. Shaywitz—the same Shaywitz that asserts there is no "superior" program—also asserts, "The good news is we really understand the steps of how you become a…skilled reader." That's

impossible. Unless you understand the task facing the naive learner, you couldn't possibly understand the various functions that would have to be in place. The MRI evidence does not reveal the task. It just generates the correlations, which in turn generate fragmented and often stupid interpretations. In other words, the "scientists" play this game: We know that these kids are "dyslexic" and those other guys are normal. Let's find some correlations based on our MRI data and from those data infer what it all means." That last part is where some form of miracle must occur. The activity in different parts of the brain has nothing to do with the content that is processed by the brain, only the loci of activity. Nobody's disputing the MRI evidence. It's the interpretation that sucks.

The notion that the kid's mind must hear the sounds of the word *cat* are partly true and partly fabrication. If our language were like Italian, with only a few exceptions, a case could be made for this simplistic idea. In fact, the process must be far more sophisticated given that by the end of the first grade the kid will be expected to decode these words: *of*, *is*, *was*, *who*, *were*, *you*, *have*, *front*, *school*, etc. None of these are "regular." The set of more common words used to compose the most elementary sentence are replete with irregulars. Try to make up a simple story in which words are composed exclusively of letters that make the same sound.

These cats have no spots. The following letters have more than one sound in this sentence: *t*, *h*, *e*, *o*, *s*. Note that the *e* makes no sound in two words.

Shaywitz's observation that some poor readers had their phoneme analyzer, word analyzers, and automatic detector more strongly linked to their memory processors than to language centers is interpreted to mean that they spend more time memorizing words than normals do. The "classic" dyslexic, in contrast, had an overactive phoneme producer and an underactive word analyzer and automatic detector. So what? Is this a cause of dyslexia or an effect of instruction that failed?

Equally important, if the activity pattern is different, there must be some difference in the "content" that the brain is representing. In other words, if the activity is more extensive, what the kid is doing when trying to figure out the word involves more steps or considerations than the kid who knows the game of decoding English words. The brain is not goofy. The kid's logic is. The poor little guy may be trying to figure out whether the word is **baby** because some jerk told him that *b* is for baby, and he sees a *b*, right there in the word. Or is it a *d*? If it's a *d*, the word must be **dog**, but it's not shaped like **dog**. Is there a picture somewhere that shows what that word is? What did the teacher say? She talked about this word, or I think it was this word. It was some word and she said something about a bowel sound.

More to the point, because this kind of improvement has only been achieved by Direct Instruction, and because it has been done in more than one school, and in fact, in any school that implements according to the numbers, there does seem to be one program that is head and shoulders above the others.

But given that the "scientists" don't understand the nature of the content or how it precisely correlates with brain patterns, they are left with the age-old scientific procedure for filling in the space between what the correlation shows and what it all means—make it up as you go along.

Here's what they would need to know (in addition to some facts about the extent to which dyslexia can be eliminated) before making the kind of proclamations about nonreaders that they make.

1. The behavior of the brain with normal children **as they are learning specific things associated with beginning reading**. Here's what they'll find. The normal kid initially has the whole brain activated when learning new things. The reason is simple. The kid doesn't know which relationships are the keys to reading, and the brain is doing its thing and trying out a large number of possibilities. There would be no difference between the dyslexic and the normal during this period. Later on, the kid who will later learn to read adequately will not have anywhere near as much activity in learning new material than the dyslexic because this guy has the right information foundation. The steps she uses to analyze the words work. She identifies words correctly. The dyslexic has to keep searching.
2. The behavior of deaf children who learn to read but who are unable to speak. Whatever their behavior is it would tend to thrash some of the assumptions about "phonemes." If the kid doesn't hear or speak but learns to read, the patterns of brain activation would be very revealing about what we're really talking about and what the language centers on the left side of the brain (most of them) are actually analyzing.
3. The changes in the brain of "young dyslexics" (those in possibly Grades 2 or 3 who have the "classic" profile) when they are taught with a **highly** effective program, a la Direct Instruction, which will tend to induce a high percentage of cor-

rect responses from the beginning rather than the kind of behavior you see when teachers are using sloppy phonics programs. This data, correlated with data about specific changes in reading behavior, would yield good information about exactly what misconceptions about reading the kids had and how the changes in the MRI pattern were correlated with specific details in their word-reading behavior.

In summary, the MRI scientists' interpretation of brain-function data is what is logically referred to as a false dilemma or an argument from ignorance. The scientists observe a correlation between brain patterns and not learning to read.

The possibilities are:

1. The brain pattern caused the nonlearning.
2. The nonlearning caused the brain pattern.
3. The interaction of a third variable caused both the nonreading and the brain pattern.

These scientists apparently don't consider possibilities 2 or 3, but proclaim that the brain pattern causes the nonlearning. There is no question that there are individual differences in reading performance; however, if the kid can find his way into the right classroom and follow simple directions, he can be taught to read in a timely manner.

An interesting footnote about the MRI data is that it is related to sounds and manipulation of sounds. Phonemic awareness is now a big deal—even for these scientists—but DI had it in 1968. That's one, but only one, of the reasons it worked in 1968. ADI

BOB DIXON

A VIEW FROM ASHANCE

Emos Thuogths on Dyslexai

The medical community has recently brought its high-tech gadgets into the field of reading, with a special emphasis on poor reading. A hot topic of late is "Dyslexia and MRIs." *Time* had a feature on dyslexia (July 28, 2003). Zig Engelmann wrote a pithy response that is printed in this issue.

A friend of mine is an emergency room physician. I was telling him a little about this MRI stuff related to reading. He couldn't picture the value of an MRI for studying reading behavior. I can't either. On the one hand, I don't know squat about what you can and can't do with an MRI. I thought that MRIs revealed physiological anomalies—tumors and the like. What I do know is that relating behavior to neurological behavior is a very tricky business. Finger and Stein, in their book *Brain Damage and Recovery*, forcefully conclude that the *minority* of data support any sort of brain theory revolving around localization of function. Put another way, the data point toward the notion that many—very, VERY many—parts and different regions of the brain interact in unknown ways, in association with any given behavior. Research on sea slug neurology strongly supports something like a "holographic" model of even the most simple and observable neurological systems.

I'm way out of my league here with MRIs and CAT scans and electroencephalographs and the like. Staying closer to home, I'd like to focus on dyslexia from a purely analytical point of view. As Engelmann and Carnine point out in *Theory of Instruction*, Direct Instruction is a rationalist–empiricist approach to instruction. This is pretty much the same as plain old science. Empiricism alone, although it sounds scientific, is like throwing mud against the wall to see what sticks. First, *things have to make sense*. It's possible (and common, I'd argue) to invest a great deal of time and effort in an intervention study that makes no sense whatsoever to begin with. We often see studies that "show" something can't be true, logically. When we dig a little, we find all sorts of errors and weaknesses in research design.

That's a rather long way of saying that I don't take much research on dyslexia very seriously because it doesn't make any sense.

Dyslexia is defined like this:

> Dyslexia is a neurologically based, often familial disorder that interferes with the acquisition of language. Varying in the degrees of severity, it is manifested by difficulties in receptive and expressive language, including phonological processing, in reading, writing, spelling, handwriting, and sometimes arithmetic. Dyslexia is not the result of lack of motivation, sensory impairment, inadequate instructional or environmental opportunities, but may occur together with these conditions. (Orton Dyslexia Society, 1994, now called the International Dyslexia Association.)