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AUTHOR Fuller, Renee
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ABSTRACT

This article tells the story of how the Ball-Stick-Bird reading system, intended for superior dyslexic students, was applied to the teaching of reading to individuals with severe to moderate mental retardation. The system incorporates developmental linguistics to make story reading easier for the beginning student. The first books of the series are composed primarily of nouns and their action verbs, and gradually adjectives and adverbs are added. In some individuals, an intellectual explosion is triggered, as the teaching system taps a fundamental building block of human cognitive organization, namely, a miniature story built with nouns at first and progressing to nouns and verbs, constituting a fundamental unit of cognitive organization which has been termed the "story engram." Every human culture talks with the engram, thinks with it, and uses it as a building block to produce bigger and bigger stories. It is the universal trademark of the human brain that it spends much of its waking life listening to, telling, and thinking up stories. Two mentally retarded individuals who experienced dramatic personality changes along with the growth in cognition through the use of this approach are profiled. (JDD)

The Primacy of Story

Renee Fuller

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THE PRIMACY OF STORY

Because our minds are united by the story engram, with which we think, dream, and hope, the world of the human mind is one world

by Renée Fuller

In an earlier issue of IN CONTEXT, Renée Fuller, creator of the Ball-Stick-Bird reading system, wrote about astonishing achievements in reading on the part of severely retarded students (IQ 20-50) – achievements she herself did not believe possible ("Beyond IQ," IC#18). But teaching these students to read did more than help them operate in a world of letters and entertain themselves. It taught them to think. What's more, it gave some of the capacity for metacognition – thinking about thinking.

Dr. Fuller, a phsyiological psychologist, has dug deeply into this phenomenon and discovered what she believes to be the basic building block of consciousness – the story engram. With direct ties to our evolutionary development, the story engram underlies all our languages, scientific discoveries, and descriptions of the world. Understanding its primacy in consciousness – and observing its effect on the individual mind when called into action from dormancy – is enough to erase many of the illusions of separateness under which we labor. We are more alike than we know.

Here Renée Fuller tells the story of Bob, a retarded man who developed rare wisdom, and the story of the story engram itself. Contact her at Ball-Stick-Bird Publications, PO Box 592, Stony Brook, NY 11790.

There he was again, trying to catch my eye. But I didn't want my eye caught. As Chief of Psychological Services at a large hospital and also heavily involved in research, there just wasn't time to respond to every retarded patient who wanted attention. But this time Bob was insistent. He stepped in front of me, blocking the path into my office.

Renée Fuller

"You write de books. I know ... Vooroos." Then, gathering steam, he repeated without hesitation "I know Vooroos." He looked at me triumphantly. Seeing my puzzled look, his eyes became pleading. "Vooroos ... I know Vooroos ... Vooroos here." His gesture with both arms seemed to indicate everywhere.

Finally I understood. "You mean the Vooroos are more than cartoons. They are ..."

"People. I know..." Then pointing at me, "You know Vooroos." I had to laugh. Bob was right. The Vooroos, characters in the books he was learning to read with (and which I had written), were indeed all around us. Amusing looking cartoons, the Vooroos are the proverbial bad guys who get their kicks out of making others unhappy. Of course in my books the bad guys always failed. That was the fun of it – good always triumphed. And as Bob later explained to me, so it would at the hospital, even though sometimes it looked as though the Vooroos had won.

That day, when Bob finally made me understand that he relished the concept of allegory, was the beginning of a series of conversations between the two of us. We talked about the latent, the hidden content of my books which he understood so well, but which many of my staff had missed. In a way we became friends.

At age 48, with a Stanford-Binet IQ of 48, Bob had been institutionalized most of his life. The heavily-funded school at the institution had valiantly tried to educate him, to no avail. After decades of intensive work, he still did not know most of the alphabet. This total lack of academic success was one of the reasons he had been chosen for the Ball-Stick-Bird research study.

The Ball-Stick-Bird reading system, intended for superior dyslexic students, was not supposed to be effective with the retarded. Nevertheless, some of my staff had insisted that we try it out on a retarded population anyway. Bob was one of their first students, and his success was immediate. After 48 years of failure, Bob learned to read! And he *understood* what he was reading! But something more important had happened, and Bob was desperately trying to tell me about it with his steadily increasing vocabulary and ability to communicate.

Bob was understanding things about life that he hadn't even been aware of before. Mimicking the idea-unit technique of Ball-Stick-Bird, he built the concepts he was trying to understand and communicate by carefully choosing the appropriate noun and then its action verb. As he became more adept, he added adjectives and adverbs to the noun/action-verb complex. In this way he was gradually able to develop and express a *philosophy of life* not only to others, but to himself.

Two more years passed. Bob, being a decade further along in life than I, began to understand things that were still out of my reach. He had witnessed a great deal of violence in his life. What he was able to verbalize, with the cognitive changes that came with the later books in the Ball-Stick-Bird series, was that violence never really paid. It damaged not only the victims, but the *perpetrators*. Bob thought about the horrendous price the perpetrators had to pay, and he felt tremendous sadness. He believed that punishment – and revenge – simply did not work, and that other ways must be found to change people. And he had seen all this in my books – in itself an astonishing achievement, since that element of the stories that somehow escaped the attention of my high-IQ staff!

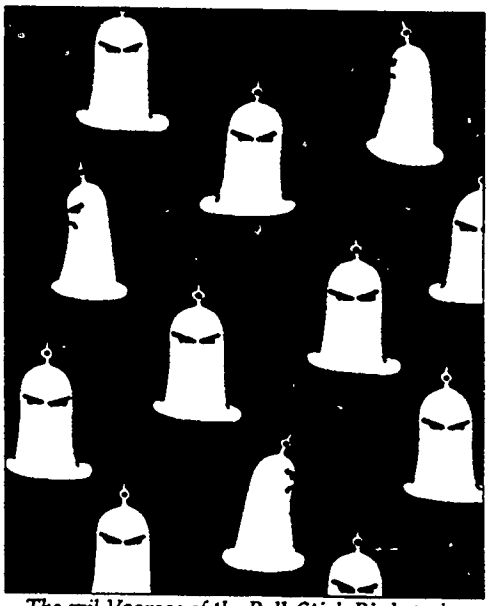
But curiously, my response to his increasing maturity was not always as generous with delight as I would have expected. Only now, many years later, do I realize what I missed.

The riches of our minds reflect who we are. They are our identity. It is not as easy to be generous about what our minds own as it is about material goods. Generous people are willing to share economic wealth, but the wealth of our minds we call our own, for it determines our ultimate status. By first grade, children frequently know where in the intellectual pecking order they belong. The tests tell them, and their parents, exactly what to expect. That Bob, a middle-aged retarded man, and I were having philosophical conversations was unexpected, and surprisingly hard to accept, even though I myself had helped create these changes.

It was easier to accept the teenager Andy, who also used idea units to build bigger stories, line by line. Andy, with his abnormal EEG, IQ of 51, and impaired psychomotor ability, was the son of two institutionalized retardates. His placement in foster care had ended in abuse and he was returned to the institution. Again, the institution's school had tried a myriad of technologies and approaches. The Ph.D.-level vice principal had spent a year on a one-to-one basis trying to teach Andy to read. At the end of the year he still could not recognize most of the letters of the alphabet. A year after our intervention, Andy laboriously wrote out what he wanted to communicate using idea units because "it help you think." His acting out dropped off sharply, and a generous, thoughtful child emerged.

Story And Thinking

What was it that had happened to these two retarded people, and to the other 24 of the original study, and the thousands since, who not only learned to read but also learned to think? Why were there such dramatic personality changes which accompanied the growth in cognition? Bob and Andy gave us a clue when they mimicked the layout in idea units and the developmental linguistics of the reading system. They did so not only in their writing, but also in their talking.



The evil Vooroos of the Ball-Stick-Bird stories

Originally I had incorporated developmental linguistics into the Ball-Stick-Bird reading system to make story reading easier for the beginning student. Recapitulating the language development of the child, the first books of the series are composed primarily with nouns and their action verbs. Gradually adjectives and adverbs are added. This is one of the B-S-B techniques that, as we were to find out, made it easy for normal four-year-olds, the dyslexic, even the severely retarded to learn to read with comprehension. But these techniques also inadvertently demonstrated, and thereby taught, how a miniature story (an idea unit which is highlighted by the B-S-B layout) can be used to build bigger and bigger stories.

The first words of children the world over are almost invariably nouns. These nouns, if the parent knows the context, frequently imply a miniature story. Within a few more months the nouns gain their action verb, and now the miniature story is more readily understood by outsiders. Shortly thereafter adjectives, then adverbs appear describing the nouns and the verbs. The connectives and articles appear later still. Last in child

Illustration from The Big Tall Vooroo *by Renée Fuller*

THE STORY OF STORY

How did this story engram come into being? Tracing the noun-action-verb ontogeny of the story engram is a fragmented but fascinating story of its own. We know that insects can communicate complicated bits of information. For example, bees can tell the other bees of their hive the location of choice pollen. However, such information processing bears little resemblance to the capacities of mammals with their versatility and flexibility.

The story engram appears to be a novel evolutionary development of the Class Mammalia. Most of us know dogs who recognize a dozen nouns, half a dozen verbs, and several adjectives. For example, the communications "good dog," "fetch ball," are not unusual. Both communications are simple story engrams – the building blocks with which human mammals tell bigger and bigger stories. Researchers found that wild vervet monkeys produce different sounds for different predators (nouns), which require different responses (verbs). Here is the story engram in its noun/action-verb ontogeny. With this kind of etiology we can see why causal relationships are so fundamental to human thinking. As with much of physiology and morphology, the evolutionary development of the story engram in mammals is similar to the progression seen in the developing child. Ontogeny recapitulates phylogeny.

Having its roots in early mammalian evolution probably explains why the story engram is so overrepresented in the human brain. Even our badly brain-damaged students were able to call on this capacity. Every human culture talks with the engram, thinks with it, and uses it as a building block to produce bigger and bigger stories. It is the universal trademark of the human brain that it spends much of its waking life listening to, telling, and thinking up stories. It is also why all humans have languages, and why all these languages have a similar grammatical structure. Sharing the noun/action-verb ontogeny, all human languages have nouns, and adjectives that describe these nouns; verbs, and adverbs that describe the verbs and adjectives. Having such similar grammatical structures, the stories of one language can readily be translated into another.

The history of the story engram has made all humans surprisingly alike in the stories they tell and listen to. It has also made what I call *engram logic* possible. We use story engrams as book titles, movie titles, headlines in newspapers, chapter headings, and when we say something "in a nutshell." Story engrams can also become scientific constructs, which we try to validate. My description in this article of "the story engram" is itself such an example. And because the story engram with which bigger and bigger stories are built is so basic to our cognitive evolution, to our human way of thinking, children from stone-age tribes can become college professors or scientists in one generation – even if we denigrate the accomplishment with "After all, he was the son of a chief."

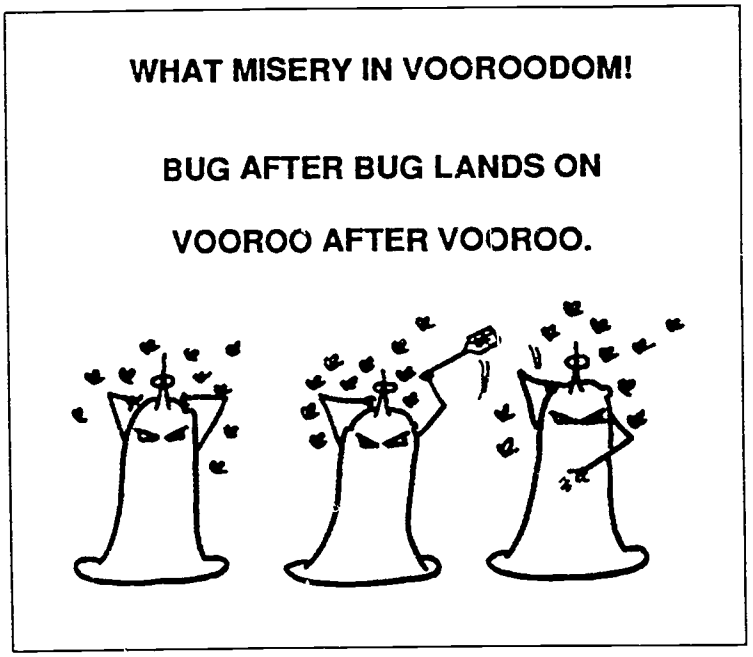


Illustration from The Big Tall Vooroo *by Renée Fuller*

For just as I found it difficult to share my intellectual status with Bob, so other intellectually wealthy individuals, or groups, or even nations, find it difficult to let go of their intellectual superiority. The curse of the IQ tests or SAT scores hangs over all our children; and the label "superior," or "average," or "developmentally delayed" has reached down to the nursery schools. Yet retarded Bob and I, two middle-aged humans, had more in common intellectually than some of my younger staff and I. However, that was after intervention – after Bob had learned how the story engram is constructed, and how to build the wonderful edifices of the human mind with it.

Now, many years later, I realize how much Bob has enriched my life. His views on pacifism haunt me still. How many Bobs are there who could enrich all our lives? How many "average" or "developmentally delayed" children are there who could be taught what the story engram can build, and as a result think deep thoughts and make a difference in many lives? All human children can have wings so their minds will soar to worlds as yet unknown. And one of the things they will discover is that *the world of the human mind is one world.* ▲

development come the prepositions, some of which are not mastered until teenage years. This is the progression by which children learn to communicate. The B-S-B teaching system, by following this natural progression, speeded up and enhanced normal cognitive development. In the case of the retarded, it sometimes made possible an approximation to normal development that was completely unexpected. We have repeatedly seen how B-S-B intervention, regardless at what age, IQ, or learning disability, triggers an astonishing intellectual explosion.

But why did the building of stories in this way trigger such extraordinary cognitive development? Had the teaching system inadvertently tapped a fundamental building block of human cognitive organization? I think it reached something so fundamental in cognitive organization that even with his/her first nouns the human child is already using this building block. It is the miniature story which the parent, knowing the context, understands. I call it the *story engram*. As the child progresses from nouns to verbs, this story engram develops in power and becomes the building block with which we humans do our thinking. Our thoughts, even the most obtuse, take the story form. And by being shown how this cognitive building block is structured – how it is used to build bigger stories – the human mind is able to do what it does naturally on a level that surpasses any previous achievements or expectations.

DISCOVERING THE STORY ENGRAM

The Ball-Stick-Bird reading system derives its name from the way it highlights alphabet configurations. The student is shown how all the letters can be built with three basic forms: a circle, a line, and an angle. These three color-coded shapes are so basic to the human nervous system that a newborn can recognize them. Even an octopus can be trained to respond to them.

By building the letters with the three forms while giving their most usual sound, four sense modalities are tapped instead of the usual two. Further, the three basic forms highlight those parts of a letter that differentiate it from other letters, and clarify which aspects of a letter are pertinent and which are merely "doohickeys."

Story reading, however, does not wait for alphabet mastery. The strategy is to get to contextual reading as rapidly as possible. To achieve this, initial memory load is reduced – beginning reading is taught with capitals, which have the additional advantage of avoiding letter reversals since in B-S-B letter building, the *big stick* is always first (to the left). Also letters are known by their most usual sound, rather than by their alphabet names, again reducing the initial memory load.

Already with the presentation of the second letter, word building begins. With the presentation of the fourth letter, the first science fiction story starts.

But what exactly is a story, and how does it come into being? Examination of the stories and letters written by our beginning readers furnished a curious clue. Line by careful line, these written communications were built with *idea units* – nouns plus action verbs – in the style of the B-S-B teaching system. I realized that the idea unit, which is actually a miniature story, was the fundamental unit of cognitive organization that had been tapped by the B-S-B system – the *story engram*.

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The story engram as the fundamental unit of information processing is not the only way information storage and processing could have evolved. An example of a very different way is that of bees – their cognitive organization is highly efficient, requiring the investment of only a tiny nervous system. In contrast, the mammalian brain is an exceedingly expensive energy investment. And it becomes progressively more energy expensive as one goes up the phylogenetic scale.

Gauging from the degree to which which we have overpopulated this planet, this energy expensive brain had a revolutionary advantage – the story engram. It allows us to draw swift conclusions about complicated interlocking stimuli. The story engram, with its capacity for story elaboration, allows not only for a phenomenal increase in memory storage and retrieval, but more information can be processed and retrieved per unit of time.

But the story engram does more. By imposing a structure on reality, it determines how we humans perceive our world. The cause-and-effect relationships, the either/or phenomena, the dichotomies, and the explanations are all imposed by an engram that derives its structure from the noun/action-verb ontogeny, which made rapid decisions and communication possible. This story engram structure determines the nature of human logic – and the lack of it.

– *Renée Fuller*

Extracted and condensed from "Teaching With The Story Engram," a scientific paper presented at the 98th Convention of the American Psychological Association, Boston, 1990.