Teaching reading with stories vs. cognitive hierarchy

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Suggestopedia emphasizes the use of interesting stories as vehicles for teaching classroom material such as reading or arithmetic. Independent support for this notion comes from the work of the author in teaching reading via stories in thé Ball-Stick-Bird method.

Suggestopedagogiek benadruk die gebruik van interessante stories as boustof by die onderrig van byvoorbeeld lees en wiskunde. Steun vir dié sienswyse kom van die skrywer van hierdie artikel waarin die resultate bespreek word van die onderrig van lees met behulp van die "Ball-Stick-Bird"-metode.

A few years ago at a meeting as part of a symposium on the Ball-Stick-Bird reading method, several of us presented data on the unexpected success of the method in teaching severely retarded students to read with comprehension. Unexpected as these results were, what was even more surprising was that they were achieved with a system intended for the superior—not the retarded. Although Ball-Stick-Bird simplifies the mechanics of reading in a number of different ways, for example, by showing how each letter of the alphabet can be made with three basic forms—a circle (ball), a line (stick), and an angle (bird), it emphasizes the abstract process of comprehension. Word building begins with the presentation of the second letter, and the stories start after the fourth letter. To deal with the vagaries of English spelling, the student is taught "code approximation". He is told that the letters of the alphabet represent a sloppy code. The only way he can be sure of the exact sound of a particular letter is to see if it makes a word that is sensible in the sentence or the paragraph. "Code approximation", in 20th century jargon, requires intellectual feedback (Fuller 1974, 1975).

The method had been designed for superior children who, however, have poor auditory and visual memories, along with a superior capacity for abstraction. The method was therefore considered beyond the intellectual capacity of the retarded. Only by chance was it tried on a retarded population.

It all began when we tested the alphabet innovation on a group of severely retarded subjects who had been exposed to a multitude of reading systems but who, in spite of every type of intervention, had not learned even the alphabet. Not unexpectedly, we found that teaching the alphabet by showing how it can be composed with the three basic forms did indeed produce more learning than usual procedures. This is where I expected the experiments to end.

But the psychologists who had done the alphabet experiments, being young and inexperienced, wanted to try the complete method, including "code approximation", on a severely retarded population. For a whole year, they lobbied before I agreed—restricting their experimentation to three patients. Much to my surprise, but not to that of the inexperienced psychologists, the three retarded subjects, and the many subsequent ones, learned to read with comprehension and changed cognitively. The success of subjects with Stanford-Binet IQs as low as 20 has been repeated again and again. These data raise profound questions, not only about the validity of IQ tests, but of the intellectual hierarchy implied by their sub-tests.

The results of the original experiment have been reported in detail elsewhere (Fuller 1975, 1977).

Early in the experimentation, it became apparent that "code approximation", rather than being excessively difficult for severely retarded subjects, was the main reason for their success. The contextual material, the stories, functioned to anchor the "bits" of information, and seemed to help in their intellectual cohesion. The stories had not only motivational value, in that they were high-interest material, but they made it easier for the subjects to understand what they had to learn and why. Reading came to resemble a game for which they were being given the rules in the process of playing. This allowed considerable implicit, rather than explicit, learning.

The subjects, however, were very explicit in their understanding of the stories. They told us, in detail, what they had read. Testing further demonstrated the importance of in-context material. Tests in which words were embedded in a sentence had significantly higher scores than tests where the same words were presented in word lists. This was especially pronounced for the very low IQ subjects. Once a retarded subject had learned to read stories with comprehension, he was also able to follow written directions. Given those results, it is curious to note that the importance of in-context material is all but ignored by the IQ tests. There are some interesting historical reasons for this oversight.

When IQ tests were first developed at the beginning of the century, their intent was to predict school success. To do this, Binet and Simon (1905) took task segments which were descriptive of the skills needed for school success. Because the techniques of turn-of-the-century education emphasized rote and segmental learning, the IQ subtests sampled this type of skill. Now more than half a century later, the tests continue to do so with relatively little change (Terman, Merrill 1960; Wechsler 1944). The most usual test items are disconnected segments such as digit span, memory for sentences, vocabulary definitions, isolated information, and so on. Characteristic of these tasks is that they are out-of-context. The child, in order to perform them successfully, is not asked how things relate to one another, to make a story out of them. Some psychologists, for example, Kagan (1963) have discussed the implication of these skills for individual cognitive style.

Although IQ tests have been credited with successfully predicting school performance, this success or failure has not always correlated with later academic performance. There are outstanding exceptions such as Darwin, Einstein, Alexander, Patton, Churchill, and a host of others who performed poorly in school, but whose intellectual achievements later in life were outstanding. Perhaps the reason these geniuses had difficulties in school was because they were called on to perform segmental tasks that are out-of-context; tasks that are similar to the items on IQ tests. Although these geniuses differ one from the other, they have in common an ability to make sense out of the world, to make a story out of what is going on. Einstein's laws of physics and relativity tried to tell us the story of the universe. Churchill made the history of the Second World War his story.

When IQ tests were first developed, they sampled current educational techniques. Since turn-of-the-century education rarely used in-context material, the tests tapped the segmentalized skills and knowledge needed for school success. With Spearman's (1927) claim that the tests measure "g", or general intelligence, the test items, by implication, became descriptive of the construct "intelligence". The growing importance of IQ tests in mass education has popularized "IQ" and reified it (Anastasi 1935; Tryon 1979). The tests have thereby perpetuated turn-of-the-century teaching techniques. Schools frequently try to teach the skills that students need to do well in IQ tests. This means they teach the segmental skills and knowledge that appear on the tests. They do not use the story method which taught our severely retarded subjects to read and which might even have made Darwin and Einstein into school successes. By continuing segmental teaching, modern education has frequently made the IQ scores self-fulfilling prophecies. Because the same skills are required in school as on the tests, the two correlate highly with one another. However, as our results have demonstrated, when you change educational techniques, the correlation between test and school performance can break down.

Although ignored by IQ tests, story comprehension appears surprisingly early in child development. By the time a child is two, he begins to follow a story. Is his budding capacity to understand a story the development of intellectual cohesion? Is this new imposition of structure on his environment the reason why he has a sudden spurt in vocabulary? Before story comprehension takes place in a child, his vocabulary consists of four or five isolated words. Then, almost overnight, his vocabulary explodes and he starts to make sentences, even if they are only two-word sentences. He now tries to communicate with words, to impose a structure on reality. The structure he tries to impose takes the story form.

Even among the retarded, there rarely is someone who cannot follow a story. There were two such students in our study. They were our two failures. Ned and Gordy were not able to follow a story, they remembered little about their own lives. Although they did not have the lowest IQs, verbal communication in the sense of telling us what had happened was all but impossible for them. And yet, Ned performed surprisingly well on the Stanford-Binet. His IQ of 63, one of the highest in the study, was achieved because he had been able to master some segmental facts and skills. But he was not able to function with these facts and skills. There is, of course, another type of patient, the schizophrenic, who frequently has the same inability to follow a story. And like Ned and Gordy, their IQ scores are also not descriptive of their level of functioning.

Although Ned and Gordy were not schizophrenic, their interaction with people and environment was on a much lower level than patients with lower IQs. The two had something else in common. Both had almost continual petit mal seizures. Perhaps the repeated electrical discharges prevented the neurological traces from being set down which would have made it possible for them to impose the story form on reality.

Advertisers have long known the effectiveness of the story, even for toddlers. But rarely have psychologists or educators shown such awareness. Had I had such awareness, I would not have been surprised when "code approximation" was effective at lower levels of development. Serendipity showed that story comprehension, which most of us would label at least for the "normal", was indeed a basic form of cognition.

The cognitive hierarchy assumed by education, IQ tests, and the construct intelligence, has its roots in the history of our science. The Cartesian conceptualization of learning, later modernized by Mills, and more recently by S-R psychology (Boring 1952), sees intellectual functioning as built by pieces of segmental learning which, in themselves, are without meaning, and have no cohesion. In spite of the work of David Katz (1948) and later Jean Piaget (1970), and now by many in this country, some of whom are on this panel (Elkind 1969, 1971; Hilliard 1975; Hunt 1961), IQ tests and education operate as though cognition requires that small segments, "bits" of information, must first be learned before their totality can be understood. Laboriously mastered segments are expected gradually to make a whole which may be reading a story, or anything else. A corollary to this is the assumption that "bits" of out-of-context material are easier to learn, are earlier in child development, than the later capacity to see things and to comprehend them in context.

One of our first subjects, Hal, demonstrated the importance of context to cognition. Hal's diagnosis was central cortical blindness which manifested itself in graphic aphasia. In other words, he had difficulty perceiving the "bits" of information required for reading. When you showed him two letters side by side and asked him if they were the same or different, he frequently was not able to answer correctly. As a result, his memory for letters was abysmal.

We took Hal on in our original study to see if his capacity to follow a story would bridge the cognitive gap involved in his inability to recognize the letters. Much to our surprise and delight, Hal did learn to read with comprehension. But even after he was reading fluently, when we showed him the letters of the alphabet separately, he frequently was not able to name them correctly.

Hal's case shows that the original conclusion of Gelb and Goldstein (1920) for traumatic cortical injury should not have been so restrictive. Their patients also were able to recognize the whole even though unable to recognize the parts. But the presumption was that this capacity to perceive the whole involved retention, not learning.

Hal's success is fascinating because, in his case, the injury occurred at birth rather than later in life. He demonstrates that there are occasions when it is possible for a person to learn a totality even though he has great difficulties in recognizing the parts (the "bits") that make up the totality. The human brain evidently is more remarkable as an adaptive and learning instrument than we had assumed.

For decades, Carl Lashley (1963) searched for the most basic unit of memory and learning, the engram. But he never found it. Was he looking for something too small? Have the IQ tests and education frequently done the same thing—tested for or taught a segment that was too small? Rather than "bits" of information being our intellectual engram, is perhaps the story the engram of our species? Is that the reason why our subjects were successful even when they had such low IQs? Is it because we inadvertently used techniques that involve the engram for our species? If so, it would explain why the IQ tests so flagrantly failed in predicting and describing the success of our retarded subjects.

Story cohesion, as the fundamental unit of cognition, could explain some disparate phenomena. For example, people tend to make a story out of their emotional states. When tired or irritated, we find a reason (a story) to justify the feelings. Under physiological conditions that produce anxiety, fear or rage, we seem to be able to find the appropriate cause—the appropriate story—to match the emotional state. We make sense out of our emotions, we create rationality for our physiological states, by placing them in the context of a story.

The need to make our life coherent, to make a story out of it, is probably so basic that we are unaware of its importance. Science has found it relatively easy to analyse the distant star or the distant molecule, but the understanding of ourselves is more elusive. To do so, we have to use ourselves as the analytical instrument. This, as Kant pointed out over a hundred years ago, is fraught with difficulty, and may be the reason why the importance of story cohesion to the intellectual process has not been obvious.

What we are so proud of, our logic, probably has its etiology in story cohesion. The first childish understandings of causality may well have their roots in the story. When we try to understand types of causality that do not easily translate themselves into a story, we have considerable intellectual difficulty. One can speculate how different our logic would be if the story were not the basis of our intellectual cohesion.

The importance of story cohesion in the evolution of our species can partly be gauged by the extent that the listening and telling of stories is linked into the pleasure centres of our brain. For anyone who doubts the linkage, remember the transfixed hours spent in front of the television set as you watch story after story unfold. Every modern prison system knows the symptoms of stimulus deprivation that occur when the major television system goes on the blink. Is the need to hear stories not only basic but necessary to our nervous system?

Is there a human culture anywhere that does not tell and listen to stories? To my knowledge, none has been discovered. For those of us who have worked in defectology, it has always been puzzling that blindness does not produce the cognitive deficits of deafness. Is this because, without the story to develop cognition, such development is crippled? From a comparative view, I also wonder whether the chimpanzees, with whom we are beginning to communicate in sign language, will also eagerly listen to stories.

Is there intelligent life some place in our galaxy that does not tell stories? What would these creatures for whom the story is not the basic form of intellectual cohesion be like? What would they talk about? Would they seem like schizophrenics to us? Or would they appear like computers? And would we have as much difficulty in communicating with them as we do with our own sick or with our machines?

Summary

The data with the Ball-Stick-Bird method make it appear that story cohesion, as the basic form of intellectual cohesion, is earlier in development and cognition than we had thought possible on the basis of IQ tests. Because these tests have determined what we think is intelligence, their importance has frozen educational techniques into the pattern of turn-of-the-century education, which the tests had been designed to sample. This has happened in spite of the early innovations of Montessori (1930) and later Piaget (1970), and so many

since. Not only have we reified IQ tests, frequently making a high score synonymous to success in life, the tests have determined what we consider easy or difficult, early or late in child development. The content of the tests, in spite of contrary data, has dramatically influenced our perception of how children think and solve problems.

Bibliography

ANASTASI, A. 1935. Some ambiguous concepts in the field of "mental organization". *American Journal of Psychology*, 47.

BINET, A. & SIMON, T. 1905. Méthodes nouvelles pour le diagnostic du niveau intellectuel des anormaux. *Année Psychologie* 11.

BORING, E. 1950. *A history of experimental psychology.* New York: Appleton-Century-Croft.

ELKIND, D. 1971. Two approaches to intelligence: Piagetian and psychometric. In Green, D.R., Ford, M.P. & Flamer, G.B. (eds.), *Measurement and Piaget.* New York: McGraw-Hill.

—— (ed.) 1968. *Jean Piaget: Six psychological studies.* New York: Random House.

FULLER, R. 1974. *Ball-Stick-Bird reading system* (vols. 1-5). Stony Brook, NY: Ball-Stick-Bird Publications.

—— 1975. *Ball-Stick-Bird reading system* (vols. 6-10). Stony Brook, NY: Ball-Stick-Bird Publications.

FULLER, R. et al. 1975. Reading as therapy in patients with severe IQ deficits. *Journal of Clinical Child Psychology* 4.

FULLER, R. 1977. *In search of the IQ correlation.* Stony Brook, NY: Ball-Stick-Bird Publications.

GELB, A. & GOLDSTEIN, K. 1920. *Psychologische Analysen hirnpathologischer Fälle.* Leipzig.

HILLIARD, A.G. 1975. The strengths and weaknesses of cognitive tests for young children. In Andrews, J.C. (ed.), *One child invisible.* Washington, DC: The National Association for the Education of Young Children.

HUNT, J. McV. 1961. *Intelligence and experience.* New York: Ronald Press.

KAGAN, J., MOSS, H.A. & SIGEL, I.E. 1963. Psychological significance of styles of conceptualization. In Wright, J.C. & Kagan, J. (eds.), *Basic cognitive processes of children.* Monographs of the Society for Research in Child Development.

KATZ, D. 1948. *Mensch und Tier.* Zürich: Mongarsten Verlag.

LASHLEY, K.S. 1963. *Brain mechanisms and intelligence.* New York: Dover Publications.

MONTESSORI, M. 1964. *Spontaneous activity in education.* Cambridge, MA: Robert Bentley.

PIAGET, J. 1970. *Science of education and the psychology of the child.* New York: Orion Press.

SPEARMAN, C. 1927. *Abilities of man.* New York: Macmillan.

TERMAN, L. & MERRILL, M. 1960. *Stanford-Binet intelligence scale.* Boston: Houghton Mifflin.

TRYON, W.W. 1979. The test-trait fallacy. *American Psychologist* 34.

WECHSLER, D. 1944. *The measurement of adult intelligence.* Baltimore: Williams & Wilkins.