

minds are engaged in doing. Indeed, we see somewhat of a turnaround here - where the literacy paper points unequivocally at schooling as a key factor in intellectual "difference," the work paper displays the essential limitations of schooling and points instead to principles of economy in activity and thinking as driving forces in cognitive growth. The distance that Sylvia transversed is characteristic of the distance that we have all traversed between the theoretical optimism of the 1960s to the more gritty and complicated realities of the 1980s and 90s.

Perhaps Sylvia expected this journey after all, and even welcomed it. She was quite clear-eyed about the issues. In footnote 16 of the literacy paper she puts the issue exactly.

Any approach which starts off to "demonstrate a link" between literacy and cognition is likely to oversimplify and over exaggerate the "uniqueness" and "significance" of the skills involved in literacy. In the modern as well as the ancient world, the spread of literacy is always accompanied by other significant social changes . . . With this caution in mind, however, it would still seem necessary to balance the risk of oversimplifying the effects of a single social phenomenon taken in isolation with the risk of continued avoidance by psychology of the significant dimensions of social life.

Many of Sylvia's "anticipations" about the effects of literacy were exciting but ultimately not in accordance with her own data. Similarly, Sylvia's search for alternative mechanisms - such as the head for hand principle - or more generally the "least effort" principle of cognitive development were a bit off target in a parallel way. Recent work by Michael Cohen (one of Sylvia's last dissertation students) examined the issues addressed in the dairy study with young children. He found that although the children did adopt what look like "least effort" strategies in calculation they also would invest a great deal of "more effort" in maintaining the scenic properties of the experiment (e.g., they were asked to "play shopkeeper" and would introduce effortful activities such as sweeping the shop up between customers to maintain the play scene).

In a parallel manner, many of the studies of the Laboratory for Cognitive Studies of Work which Sylvia had initiated have yielded data which makes matters infinitely more complicated, and infinitely more "local" than Sylvia would have imagined. For example, we have been studying the impact of abstract control systems in the workplace on workers' knowledge. We have found that the particular organization of practices on the job is more

important than the presence of the abstract system for determining workers' ways of thinking.

Sylvia would have been undeterred. She understood that knowledge is progressive, that it takes work to know, and that the activity will often produce false starts, over-general principles, "laws" that end up being local to an activity. She might have understood that the search for laws has ended us up in an engagement in practices that may not have general laws. But she would have continued to look for the laws - because the benefits of conducting that search were far greater than the risks of not looking at all.

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On "The Cognitive Consequences of Literacy" by Sylvia Scribner

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Like hearing about the assassination of John Kennedy, I can remember exactly where I was when I first opened Sylvia Scribner's unpublished manuscript, "The Cognitive Consequences of Literacy." And I remember both events for exactly the same reason: they stunned me, albeit for obviously different reasons. Before reading her paper (in my office at the Harvard Center for Cognitive Studies), I had never heard of or met Sylvia Scribner; I was stunned by her theoretical brilliance. Some of my reaction may have been a bit egocentric, however, because, strangely enough, I had, a few months before, written and delivered a paper on exactly the same topic. My paper was called "Oral vs. Written Language: The Consequences for Cognitive Development" (Greenfield, 1968).

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When I was inducted into the Radcliffe College chapter of Phi Beta Kappa in 1961, sociologist Robert Merton gave a talk entitled "Doubles in Science." His thesis was that often two or more scientists independently make the same "discovery" at about the same time, and that these "doubles" are not a coincidence. Simultaneous discoveries stem rather from the fact that science is cumulative and the history of science is often such that the trend of earlier work prepares the intellectual ground for a current "discovery," in itself less a matter of individual discovery than organic historical growth of a collective field. Our papers were an amazing "double": Scribner's "The Cognitive Consequences of Literacy" and Greenfield's "Oral or Written Language" were not only written in the same year, they were actually written in the same month, February, 1968!

Through an accident of history or temperament, or perhaps both, we were on the same wavelength. Both of us saw written language as a sociocultural tool affecting cognitive development and the use of oral language. Both noted the way in which only words can be used to create context in writing, whereas the nonverbal situation and nonverbal communication are possible context constructors for oral speech. Both of us drew upon Vygotsky's theory of symbols and Bruner's theory of modes of representation. Both drew upon Basil Bernstein's notion of restricted and elaborated codes; both hypothesized that the origins of Bernstein's codes lay in differential exposure to and skill with written language. Both of us even drew upon my research in Senegal, particularly the comparison of schooled and unschooled children.¹

Both of us used Piagetian theory. And both turned Piaget a bit on his head. Piaget had emphasized activity or operation on the external world as the very nature of cognitive development. We both realized that writing provided an opportunity to manipulate thought in a very concrete way. Therefore, each reasoned, the cultural tool of writing could provide an opportunity for operating on thought, one of the hallmarks of Piaget's stage of formal operations. If so, then the presence and use of a written language in a culture could potentially affect whether or not formal operations ever developed. In essence, both used Piagetian theory to draw an anti-Piagetian conclusion: that his stages were not necessarily universal, but could be dependent on culturally variable products, notably a written language.

Somehow, Sylvia Scribner and I had been metaphorically in the same place and the same time in the history of our science. Not only were we familiar with the same

sources, but we had read them through a similar lens of appreciation, criticism, and synthesis.

The major difference I saw between our two papers was that hers was so much broader in scope, so much more brilliant. Her scholarship covered philosophy, anthropology, and the history of ideas. She could relate Piaget to Levi-Strauss. I can remember wishing I had written Sylvia Scribner's paper rather than mine!

In fact, I remembered Scribner's treatment of written language and formal operations better than my own in later years. When I came to write my book *Mind and Media* (Greenfield, 1984), the idea that writing makes the manipulation of thought concretely possible seemed relevant to the possible cognitive consequences of a new cultural tool, the wordprocessor, a technology which vastly expands the possibilities for an individual to concretely manipulate his or her own thought processes; and I drew upon Sylvia's paper, rather than my own, as the theoretical foundation for this notion.

Sylvia wrote "The Cognitive Consequences of Literacy" as a graduate student, before she went to Rockefeller University to work in Michael Cole's Laboratory of Comparative Human Cognition. She saw her paper as a prelude to "a direct research attack on literacy as a mechanism of cognitive growth." She closes with a wish to go beyond my studies in Senegal, in order to disentangle literacy from schooling. "While the written language is an indispensable and inseparable feature of the school experience," she wrote, "the converse does not hold. The opportunity still remains to investigate the impact of written language acquisition divorced from the school context" (Scribner, 1968, 1992, p. 100).

Seemingly unbeknownst to Scribner when she wrote her paper in 1968, Cole, Gay, and Glick (1969) had already begun to study the effects of writing separate from the effects of schooling. Indeed, they had obtained results in Liberia that supported a theme in both Scribner (1968, 1992) and Greenfield (1968, 1972): The possession of a written language influences speakers to provide more verbal context in their oral communications. This particular research, with its initial findings, must have been one of the attractions that drew Scribner to the Laboratory of Comparative Human Cognition later that year. Ironically, though, by the time that Scribner and Cole had completed their monumental study of Vai literacies (1981), they had moved away from the kind of global literacy effects Scribner (and Greenfield) posited in their 1968 papers to context-specific effects that depended on the particular uses to which literacy was put.

Why was "The Cognitive Consequences of Literacy" not published at the time it was written? If I recall correctly, Sylvia felt the paper was unpublishable. Anyone concerned with progress in the field must ask, "Why should a brilliant woman feel that a groundbreaking paper cannot be published?" Part of the answer is that the American *zeitgeist* was not right for these sorts of theoretical ideas, presented in a format that did not fit in with standard psychological genres - as I found out when I tried to publish my own paper. Indeed, I believe that paper, "Oral or Written Language," occasioned a series of rejections from American journals and was finally submitted to the British journal *Language and Speech*, in which it appeared four years later (Greenfield, 1972). The paper received no response on this side of the Atlantic and little in England.

Compounding the problem, for Sylvia as well as me, was our female gender. It was particularly difficult for a woman at that time to publish an article outside the prevailing paradigm, without some sort of backing from a well-known male colleague. Fortunately for our field, Sylvia quickly found this kind of backing from Michael Cole, the first to recognize her genius; and they began a long and marvelously fruitful collaboration.

Nonetheless, it is sad that the paper was not published at the time it was written. In it we see Scribner's vision for the future, a broad-stroked vision, full of enthusiasm. When I reread this paper in 1992, I had the feeling that, with all her many important accomplishments, Sylvia Scribner never produced another work of the same theoretical and scholarly scope.

Nonetheless, much of Scribner's vision for studying "the possible interconnections between social inventions and cognitive development" presented in the 1968 paper has come to pass. Given the *zeitgeist* and prevailing paradigms of the time, it is perhaps unrealistic to think that our field could have advanced more rapidly, had "The Cognitive Consequences of Literacy" been widely available to Sylvia Scribner's colleagues two decades earlier. Still, I can't help wondering. Despite the fact that Scribner's own views on the cognitive consequences of literacy shifted in the course of her later career, the 1968 paper still sounds fresh and, as I am confident the collected commentaries will show, is stimulating and provocative, even in 1992.

Merton's view of the history of science is a deterministic one. Still, to whatever extent I have helped to write the same chapter in the history of social science as Sylvia

Scribner, I feel a great sense of personal pride. Merton notwithstanding, Sylvia Scribner was a unique participant in our game of science; the rules would be different today had she not played.

Notes

¹I wanted to clarify a comment made by Scribner about my concept formation findings in Senegal: "Only the school children showed a growth in the ability to state the rule that was governing their groupings." This is true in the sense that only schooled Wolof children expressed the verbal principle behind their groupings *in sentential form*, and the tendency to do so increased with age. The unschooled Wolof children, however, did verbally state the criterion for their groupings at all ages; they just formulated their rule in a different verbal format, the single word - e.g., "red."

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Comments on "The Cognitive Consequences of Literacy"

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This article, which is referred to as Scribner's earlier work on literacy in Scribner and Cole (1981), interests me

0278-4351/92/14-120 \$1.00 © LCHC