Literacy without Schooling: Testing for Intellectual Effects

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A variety of claims has been made about the relationship between literacy and intellectual development. Many developmental psychologists hold that skills in reading and writing lead inevitably to major transformations in cognitive capacities. Drawing from their observations of unschooled but literate adults, Sylvia Scribner and Michael Cole have questioned some of the generalizations made about the consequences of literacy. Their research among the Vai of Liberia, a people who have invented a syllabic writing system to represent their own language, provides a unique opportunity to investigate the effects of becoming literate separtely from the effects of attending school.

In most discussions of schooling and literacy, the two are so closely intertwined that they are virtually indistinguishable. Yet intellectual consequences have been claimed for each as though they were clearly independent of one another. For several years we have been studying the relation between schooling and literacy, particularly the psychological consequences of each and the extent to which they substitute for each other. Our research among the Vai, a West African people for whom schooling and the acquisition of literacy are separate activities, has led us to reconsider the nature of literacy and its intellectual effects.

Over the centuries and across disciplines, there has been remarkable agreement that the written word has its own peculiar psychological properties. Its relationship to memory and thinking is claimed to be different from that of the spoken word, but conceptions of this relationship are as diverse as the perspectives brought to bear on the question.

Plato considered the issue within the context of basic educational goals and values, suggesting that the relationship of writing to intellect be considered prob-

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lematic, rather than taken at face value. To the claim that letters would give men better memories and make them wise, Socrates replied that, on the contrary, letters would create forgetfulness. Learners would not use their memories but rely instead on external aids for "reminiscence." Disciples of the written word would "have the show of wisdom without the reality" (Plato, p. 323). Plato, on the other hand, was suspicious of education that relied solely on the oral mode of the Homeric tradition. Oral thinking in this context was considered the enemy of logic (Havelock, 1963).

The view that the relationship between writing and mental abilities is problematic has given way to the dominant belief that literacy leads inevitably to higher forms of thought. Oral and literate thought are often contrasted in a modern version of the old dichotomy of primitive and civilized thought. Increasingly, literacy instruction is justified not only as a means to material advancement for the individual and society but also as a means of transforming minds. The UNESCO Secretary-General has recently urged the acceleration of world-wide literacy programs to overcome the deep psychological differences between oral and literate thought (UNESCO, 1965). Similar arguments are made in pedagogical discussions here in the United States (Farrell, 1977).

Debates about the cognitive consequences of literacy play a role in determining priorities for national investments in education and in defining the desired outcomes of schooling. Moreover, the claims for consequences themselves have consequences. If, for example, we believe that literacy is a precondition for abstract thinking, how do we evaluate the intellectual skills of nonliterate people? Do we consider them incapable of participating in modern society because they are limited to the particularistic and concrete? If we believe that writing and logical thinking are always mutually dependent, what do we conclude about the reasoning abilities of a college student who writes an incoherent essay? Is this an automatic sign of defective logic? Answers to these questions have implications for social and educational policies that are at least as profound as those questions that concerned Plato.

To examine some of these implications, we will consider recent work in experimental psychology that brings an empirical perspective to these questions. We will analyze how different investigators specify the relationships between literacy and intellectual skills. Oversimplifying, we will contrast two perspectives: one represented by the metaphor of literacy as development, and the other, by literacy as practice. The developmental framework is an established theoretical tradition. Its presuppositions implicitly or explicitly inform the great majority of literacy and instructional writing programs. The framework of practice, or function, is our own attempt at systematizing the knowledge we gained while investigating literacy without schooling among the Vai. Although the two perspectives start from similar questions, we will intentionally sharpen their contrasting features to bring out their different implications for research and educational policy. The differences lie both in the nature of the evidence considered crucial for developing hypotheses about literacy and in the procedures for relating evidence to theory. Our purpose is not to pose them as entirely antagonistic or to argue for the one

best model. Rather we advocate an approach to literacy that moves beyond generalities to a consideration of the organization and use of literacy in different social contexts.

Literacy as Development

In the 1960s Greenfield and Bruner (1966) put forward the thesis that writing promotes cognitive development. This was derived largely from Greenfield's (1966) studies in Senegal, comparing the performance of schooled and unschooled Wolof children on experimental cognitive tasks. In one task, children were required to sort pictures or objects into groups of things that belonged together and to explain the basis of their sorting. The items could be exhaustively grouped by form, function, or color. Three aspects of performance were considered especially indicative of levels of abstract thinking. First, school children more often shifted the basis of their grouping from one attribute to another over trials. For example, if they sorted by color on the first trial, on the second trial they might sort by function or form. Second, when asked to explain the basis of their sorting, school children tended to state their reasons in sentences with predication, saying, for example, "these *are* red," instead of using a label "red" or a phrase, *"this red,"* such as unschooled children tended to do. Finally, school children could easily answer questions about why they thought items were alike whereas unschooled children had difficulty doing this. Greenfield interpreted these performance characteristics as measures of a general ability for context-independent, abstract thinking that only school children displayed.

Greenfield (1972) suggested that oral language relies on context for the communication of messages and is, therefore, a context-dependent language. In contrast, written language requires that meaning be made clear, independent of the immediate reference. If one assumes that context-dependent speech is linked with context-dependent thought, and context-dependent thought is the opposite of abstract thought, it follows that abstract thought fails to develop in an oral culture. Put the other way around, societies with written language provide the means for decontextualized abstract thinking; and since schooling relies primarily on written language, those attending school get a greater push toward abstract thought than those not going to school (Bruner, Olver, Greenfield, Hornsby, Kemey, Maccoby, Modiano, Mosher, Olson, Potter, Reisch, & Sonstroem, 1966, p. 318).

Bruner has presented the most general form of this argument—namely that technologies available in a given culture determine the level and range of abilities in its members. Environments with such symbolic technologies as a written language "push cognitive growth better, earlier and longer than others" (Greenfield & Bruner, 1966, p. 654).

Olson also believes that literacy and education push cognitive growth. In recent essays (1975, 1977, in press) he contends that a unique form of logical competency is linked to literacy. This competency involves the mastery of the logical functions of language apart from its interpersonal functions. According to Olson, literate individuals come to regard meaning as residing in the text. An example is

the ability to derive from the sentence "John hit Mary" the logical implication that "Mary was hit by John." Another is drawing logical conclusions from propositions solely from their linguistic evidence and without considering their factual status. Such logical abilities are not universal, Olson (1977) maintains, but are the endpoint of development in literate cultures. To secure evidence for literacy-related logical processes, Olson and his colleagues (for example, Olson & Filby, 1972) have conducted experimental studies of sentence comprehension and reasoning, comparing the performance of preliterate, preschool youngsters with school children of varying ages and with educated literate adults. Olson's speculations about how literacy develops these abilities come from historical analyses of the cultural changes accompanying the invention of the alphabet and the printing press. Both these inventions, Olson says, increase the explicitness of language, biasing cultures toward the development of explicit formal systems and accounting for distinctive modes of thought in Western societies.

This brief summary fails to do justice to the full argument of these psychologists but it does permit us to focus on what we conceive to be certain limitations and difficulties of the developmental perspective. This work is important and innovative, but we wish to caution against the notion that this evidence of the effects of literacy can provide a foundation for educational programs and that it offers a model strategy for future research.

A defining characteristic of the developmental perspective is that it specifies literacy's effects as the emergence of general mental capacities—abstract thinking, for example, or logical operations—rather than specific skills. These abilities are presumed to characterize the individual's intellectual functioning across a wide range of tasks. Thus, based on a limited sample of performance in experimental contexts, the conclusion has been drawn that there is a great divide between the intellectual competencies of people living in oral cultures and those in literate cultures.

From this perspective the capacities generated by literacy are seen not merely as different, but as higher-order capacities because they resemble the abilities that psychological theories attribute to later stages in development. For decades, developmental inquiry has been organized around the notion that children's thinking progresses from the concrete to the abstract. Olson specifically links literacy-related logical operations to Piaget's final stage of formal operational thought. It is within this framework that statements are made about arrested mental growth in cultures without literacy. Since this research compares children of different ages as well as children and adults, a developmental interpretation seems to have some validity. Can it be extrapolated, without further evidence, to characterize changes in the intellectual operations of adolescents and adults? Whether or not these changes are developmental, in a transformational sense, should at the very least be considered an open question.

Perhaps the most serious problem with this work is its vagueness about the mechanisms by which literacy promotes new intellectual capacities. Both Greenfield and Olson present plausible hypotheses about how literacy achieves its effects, but they offer a multitude of possibilities and no systematic theory for select-

ing the most fruitful for further exploration. Greenfield (1972) variously attributes the effects of literacy to the structure of the written language, to the school-based uses of language, or to growing up in a literate culture and speaking a written language. Olson (1977) stresses the effects on mental skills of the properties of an alphabetic script, of the exposure to the school language of written text, or of the acquisition of bodies of written knowledge. The ways in which these alleged antecedents exert their effects, however, are neither specified nor linked to the observed behaviors. Piaget (1976) has recently pointed out the limitations of this perspective: "To explain a psychological reaction or a cognitive mechanism . . . is not simply to describe it, but to comprehend the process by which it is formed. Failing that, one can but note results without grasping their meaning" (p. vi).

These empirical studies do not clarify the specific contribution of any of these experiences. None tested literacy as such. In all research, literacy was confounded with schooling; yet students are engaged in many learning experiences in school besides learning how to read and write. And we are all aware today that some children spend many years in school without learning how to read and write. There is little guidance here for educational policies and programs. To set educational goals and to plan curricula, research is needed that relates particular kinds of experiences with written language to the development of particular skills.

A final observation is that the developmental perspective supports an "inevitability" interpretation of literacy. It assumes that various components of literacy—say, an alphabetic script or an essayist text—are likely to have the same psychological consequences in all cultures irrespective of the contexts of use or of the social institutions in which literacy is embedded. In reality, however, the developmental model has been elaborated in terms of institutions and technologies specific to our own society. It has been restricted to literacy as practiced in the schools. In addition, confusion stems from failure to differentiate the consequences of literacy over the course of human history from its consequences for the individual in present-day societies. It is a big jump from intellectual and cultural history to a theory of ontogenetic development in any present-day society.

A Functional Approach to Schooling and Literacy

We have long been interested in cultural influences on the development of thought, particularly the influence of literacy (Scribner, Note 1) and formal schooling (Scribner & Cole, 1973); however, we have been skeptical about the usefulness of applying current developmental theory to these problems. Some of our doubts arose from the observation of unschooled nonliterate adults in other societies, some from experiments comparing schooled and unschooled individuals on cognitive tasks. We concluded from these data that the tendency of schooled populations to generalize across a wide range of problems occurred because schooling provides people with a great deal of practice in treating individual learning problems as instances of general classes of problems. Moreover, we did not assume that the skills promoted by schooling would necessarily be applied in contexts unrelated to school experience. This orientation led us to concentrate on the actual

practices of literacy that hypothetically produced behavioral changes, looking for likely causal mechanisms. We needed a way to examine the consequences of literacy apart from schooling under conditions that made literate practices most accessible to observation.

The Vai are a traditional society on the northwest coast of Liberia who are well known in that area for their invention of a syllabic writing system to represent their own language. Preliminary reports (for example, Stewart, 1967) and our own observations indicated that between 20 and 25 percent of Vai men could read and write using their own script, which was invented approximately 150 years ago and transmitted from one generation to another without schooling or professional teachers. The mere existence of an indigenous writing system was enough to arouse our curiosity, but we were interested in the Vai for two additional reasons. First, except that they are predominantly Muslim, the Vai, according to ethnographies of Liberia, are virtually indistinguishable from their neighbors in terms of ecology, social organization, economic activities, and material culture. Second, their writing and reading are not activities separate from other daily pursuits, nor does learning to read and write require a person to master a large body of knowledge that is unavailable from oral sources. These two characteristics of Vai literacy provided an extremely interesting, if not unique, opportunity to investigate the effects of becoming literate separately from the effects of attending school or becoming educated, an inquiry that had heretofore eluded social science.

A detailed description of this work is beyond the scope of this article; however, we will briefly describe its major phases to explain what we mean by a functional approach to the study of literacy and thinking. To begin with, we gave questionnaires and tests to more than 700 Vai adults. Our survey included a variety of tasks based on previous research showing the effects of formal schooling among tribal Liberians. These tasks were included to determine if cognitive performance that was improved by schooling was similarly influenced by indigenous Vai literacy. The test battery also contained sorting and verbal reasoning tasks similar to those used by Greenfield and Olson as the basis for speculations about literacy effects. Results were clearcut. As in previous research, improved performance was associated with years of formal schooling, but literacy in the Vai script did not substitute for schooling. Vai literates were not significantly different from nonliterates on any of these cognitive measures, including the sorting and reasoning tasks that had been suggested as especially sensitive to experience with a written language.[1]

In the next phase of our work we moved down one level of generality in the kinds of hypotheses we tested. Instead of looking for improvements in general cognitive performance associated with literacy, we concentrated on the hypothesis that literacy promotes metalinguistic skills—the idea that in acquiring literacy skills an individual acquires the ability to analyze language (Goody, 1977). One task tested nominal realism, the identification of name and object; other items

[1] Any effects reported as significant refer to regression analyses in which the variable in question entered the equation at the .05 level of significance or better.

tested the ability to specify the nature of grammatical rules, to reason from evidence provided by a syllogism, and to define words.

This series of studies showed that Vai literacy was associated with small increments in performance for some of the tasks (for example, increased ability to specify the nature of a grammatical error in spoken Vai) but there was no across-the-board evidence of enhanced performance associated with this unschooled literacy. Furthermore, and most damaging to the metalinguistic hypothesis, our results showed virtually no correlations among performances on the various probes of metalinguistic ability.

At the end of our first year of fieldwork, we had not made much progress in illuminating literacy skills among the Vai by administering standard laboratory tasks whose theoretical status with respect to literacy was uncertain. We decided to take a different approach. Instead of working down from developmental theories, we began to work up from actual observations of how literacy was socially organized and used by the Vai. We decided to base our experimental activities on our ethnographic observations—to let our fieldwork generate specific hypotheses and suggest appropriate tasks.

Reading and writing are not prominent activities in the villages; still, the knowledge and use of the script by Vai literates are manifest in many ways. For one thing, the arrival of a taxi often brings letters, written in Vai, from relatives and business associates in other areas of Vai country and other parts of Liberia. We found that Vai literates write and receive between one and forty letters a month, depending upon a number of factors, including the kinds of economic enterprises in which they are involved and the location of the town in which they live. Funerals are a ubiquitous feature of life in a Vai village, where the infant mortality rate exceeds 50 percent and life expectancy is low. Funerals attract relatives and acquaintances from many parts of the country, each of whom is obligated to bring gifts in money or kind that must be reciprocated. Consequently, recording the names of donors and their gifts at funerals, as well as a variety of other administrative activities such as listing political contributions, are features of Vai life in which literacy plays a central and visible role. Some religious and fraternal organizations maintain records in Vai script, and we have documented at least one case in which a Muslim association was governed by a constitution and by-laws written in Vai script (Goody, Cole, & Scribner, 1977). Farmers and craftsmen use the script for business ledgers and technical plans. A few who might qualify as Vai scholars write family and clan histories, keep diaries, and record maxims and traditional tales in copybooks.

Despite test results, we know that Vai literacy functions in the society and that Vai people seem to feel that it functions well since literates are accorded high status. We began to look carefully at the specific skills these literacy activities seemed to involve: what did it require to write a letter, record contributions to a funeral feast, or list contributions to a religious society? We made functional analyses of the skills involved in these activities. Then, on the basis of these analyses, we designed tasks with different content but hypothetically similar skills to determine if prior practice in learning and use of the script enhanced performance.

Since letter-writing is the most common use of the Vai script, we closely studied the cognitive consequences of letter-writing. In the psychological literature, written communication is said to impose cognitive demands not encountered in face-to-face oral communication. In writing, meaning is supposed to be carried entirely by the text; thus, effective written communication requires sensitivity to the informational needs of the reader and skill in the use of elaborative linguistic techniques. We speculated that Vai literates' experience in writing and reading letters would contribute to the development of these skills, especially because the ability to communicate in writing with people from different places signifies successful completion of the study of the script.

To test this proposition, we adapted a communication task used in previous research (Flavell, Botkin, Fry, Wright, & Jarvis, 1968). Individuals were taught to play a simple board game with little verbal explanation; they were then asked to explain the game, without the materials of the game present, to a listener unfamiliar with it. In addition, we asked subjects to dictate a letter explaining the game to someone far away who had never seen it before.

The game involves two players taking turns racing their counters on a board of eight colored stripes. A counter's movements are governed by the color of the chip selected from a cup on each turn (Flavell et al., 1968). Board games are familiar to the Vai, who play a game called "ludo," which has a similar racing format.

We coded the transcribed protocols for the amount of game-related information they contained and for the presence of statements describing the materials of the game. On both of these measures of quality of communication, we found that men literate in the Vai script were far superior to nonliterates, and that this pattern was apparent in both the face-to-face explanation and the dictated letter. We also analyzed the protocols to see whether they reflected characteristics of Vai literates' style of communication in their day-to-day letter-writing practices.

Over the years, Vai letters have evolved certain stylized formats. Here is a sample:

17/7/1964
Vaitown

This letter belongs to Pa Lamii in Vonzuan. My greeting to you, and my greeting to Mother.

This is your information. I am asking you to do me a favor. The people I called to saw my timber charged me $160.00. I paid them $120.00 and $40.00 still needed, but business is hard this time. I am therefore sending your child to you to please credit me amount of $40.00 to pay these people. Please do not let me down.

I stopped so far.

I am Moley Doma
Vaitown

The statements "This is your information. I am asking you to do me a favor." are examples of what we call the contextualization of the communication. They tell the recipient what the communication is all about and what information to

expect. This aspect of an effective communication was well understood by Vai literates and clearly explained to us in some of our interviews. In one discussion on what makes a good letter, a middle-aged farmer told us, "You must first make the person to understand that you are informing him through words. Then he will give his attention there. It is the correct way of writing the Vai script." When we examined game instructions for this characteristic we found that Vai literates almost always contextualized their communication by giving some general characterization of the game—for example, "This is a game I am coming to tell you about where two people take a race and one of them wins."

A second set of studies tested for the transfer of skills needed to read Vai text. Our observations of Vai literates deciphering letters from friends and coping with mundane reading indicated that decoding the script is extraordinarily difficult because of special properties of the Vai writing system. Vai script characters map the consonant-vowel syllabic structure of the language in a systematic manner; however, this does not produce a direct one-to-one correspondence between the visual symbols and the units of sound. Vowel tone, a phonological feature that is semantically crucial in the spoken language, is not marked in the script. In addition, because the script is not standardized, the representation of vowel length, another semantically distinctive feature of the language, varies considerably from one script-writer to another. Finally, the script is written without division into words or other language units; a string of syllabic characters runs across the page without spacing or segmentation. Each character, depending on its semantic function, may represent a single-syllable word, one of several such words differentiated by tone, or a component unit of a polysyllabic word.

How does a literate Vai resolve these ambiguities? From observations of men reading letters we found that a common technique is what we have called experimentation in pronunciation—saying strings of syllables aloud recursively, varying vowel tones and lengths until they click into meaningful units. Readers must keep separate syllables in mind until they can be integrated into words or phrases. We supposed that this experience might foster skills in language analysis and integration and that these skills might apply in language contexts that did not involve the script. To test this idea we devised a listening task. Each person listened to tape recordings in which a native speaker of Vai slowly read meaningful Vai sentences. Sentences were segmented either into word units or syllable units. The listener was simply asked to repeat the sentence and answer a comprehension question about it. On sentences containing word units, there was no superiority for individuals with experience in Vai script; but, on sentences composed of syllable units, Vai literates with advanced reading skills outdistanced all others, including those with fewer years of practice in reading.

These two tasks, and the remainder of our research, demonstrate that skills involved in literacy behaviors are indeed transferable to behaviors unrelated to literacy. The effects reported—analyzing oral speech and giving clearer instructions —are neither self-evident nor trivial. Speech perception and instruction have real utility. These studies provide the first direct evidence that what an individual does with text, or with pencil and paper, can promote specific skills that are avail-

able to support other behaviors. In terms of the concerns with which the research began, we believe it important that these skills are associated with literacy, not with schooling—they are not byproducts of general learning experiences in the classroom. Although our demonstration of literacy-related skills is limited by the range of literacy practices in Vai society, it stands as the first clear-cut evidence in a present-day society that personal engagement in reading and writing does have psychological consequences. These consequences, however, are all highly specific to activities with the Vai script.

The metaphor of literacy as a practice will help us put the Vai research in a more general framework. By combining several dictionary definitions, we can state what we mean by "a practice." A practice may be considered to be the carrying out of a goal-directed sequence of activities, using particular technologies and applying particular systems of knowledge. It is a usual mode or method of doing something—playing the piano, sewing trousers, writing letters. This definition shares certain features with the notion of practice in educational psychology—repeated performance of an act in order to acquire proficiency or skill. How does this apply to literacy? Consider a goal-directed sequence of activities such as letter-writing. This involves a technology—a particular script and particular writing materials. It also requires knowledge of how to represent oral language in script and of the conventional rules of representation. One must know the form and style suitable for writing personal letters as well as what the intended reader knows about the subject of the message and how the new information will fit into the old. A variety of skills at different levels is required to perform this complex act. As one writes more letters, these skills should become more efficiently organized, less dependent on content, and more transferable to new contents and contexts. We did indeed find transfer of these skills in our game-instruction task but the range of transfer was narrow. In summary, our results show that certain literacy practices among the Vai produced intellectual outcomes closely tied to those practices.

Our negative findings are an equally important part of the story. We did not find that literacy in the Vai script was associated in any way with generalized competencies such as abstraction, verbal reasoning, or metalinguistic skills. The tasks used in North American research as alternative measures of these capacities simply did not show consistency of performance in any group except the schooled group. Furthermore, we did not find that either literacy or schooling had an all-or-none effect; on all experimental tasks, including those showing the strongest effects of Vai literacy, some nonliterates achieved high scores and displayed the same skills as literates.

The results of our research among the Vai present us with two apparently contrasting conclusions about the effects of literacy. The literacy as development view would have us believe that literacy, in combination with schooling, produces generalized changes in the way people think. Our functional perspective suggests that the effects of literacy, and perhaps schooling as well, are restricted—perhaps to the practice actually engaged in or generalized only to closely related practices. These extreme alternatives echo an educational debate that began at the turn of the century. Thorndike and Woodworth (1901) suggested that learning is specific and

transfer from one task to another will occur only when both tasks shared identical elements. Their antagonists believed that education, through mental discipline, strengthens the mind in general. (For a summary of the arguments at that time, see Thorndike, 1969, p. 357.) However, no theory guided the search for identical elements and no theory gave substance to the mental discipline position. After seventy-five years of debate and data accumulation, the issue of the effects of practice has not been resolved. We have no illusions that our skimpy data with respect to literacy will resolve the discrepancies between these two viewpoints, but our framework may help us think about literacy and its effects in a way that does not get us lost in unsupported generalities or insignificant particulars.

The specific outcomes that we observed in our studies of Vai literacy confirm earlier observations that certain cognitive skills show little generalizability across experimental tasks among traditional adults. The situation with respect to Vai writing and reading is similar to that of other skilled practices—such as weaving (Childs & Greenfield, in press) or pottery-making (Bunzel, 1953)—in nontechnological societies, in which highly organized, complex skills are applied to a limited set of problems. Previously, we argued that generalized skills might not arise when common operations are applied to a limited set of tasks (Scribner & Cole, 1973). If the uses of writing are few and limited, skills should be applied to each use in a more or less original way. As the repertoire of functions expands, the operations necessary for each may be applied across a range of tasks and contexts. For example, an individual might write a letter to distribute proceeds from a funeral feast—two functions that are usually separate. This example represents the upper limit of typical Vai writing practices because each individual's practices are restricted.

As the technology of any society becomes more complex, the number and variety of tasks to which literacy skills must be applied increases as well. A task might include some mix of a common core of skills like decoding, for example, with new skills or more complicated versions of old skills, as when Vai tradesmen begin to write to people they have never met before because business practice makes this necessary. If our argument that specific uses promote specific skills is valid, we might expect to find the outcomes that Olson or others predict, but only under conditions evoking these skills. Carrying out critical analyses of text, for example, might promote certain analytic operations with language, whereas rote learning from the same text, or reading it for some other purpose, is not likely to do so. Writing poetry is likely to have different consequences for language skills than preparing a letter to a department store requesting a refund for damaged goods.

As practice in any activity continues, we would expect that skills would extend to a wide range of tasks and materials and when the skill systems involved in literacy are many, varied, complex, and widely applicable, the functional and general ability perspectives will converge in their predictions of intellectual outcomes. Whether we choose to interpret these acquired functional skill systems de-

velopmentally is a matter of theoretical predilection, the discussion of which lies outside the argument of this article.

Although we do not advocate a single approach to the complex issues of the psychology of literacy, we believe that the strategy of functional analysis emerging from the Vai research may have particularly useful implications for educational research in our own society. It suggests that different literacy activities need to be analyzed independently. If, as we have demonstrated, particular skills are promoted by particular kinds of literacy practices, we need to know a great deal more about just how literacy is practiced. Studies of the range of reading and writing activities carried out in school, including those outside the official curriculum, would be a useful extension of work such as that done by Martin, D'Arcy, Newton, and Parker (1976). We have far fewer precedents, however, for an equally important research task: finding out what people in various communities and walks of life do with literacy—how they use their knowledge of reading and writing, to what tasks they apply it, and how they accomplish these tasks. Such analyses should help us understand the differences between school-based literacy practices and literacy practices unrelated to schooling as well as their possibly different implications for intellectual outcomes. Although attempts to arrive at some overall measures of literacy competencies may be useful for certain comparative purposes, the conceptualization of literacy as a fixed inventory of skills that can be assessed outside of the contexts of application has little utility for educational policies.

We need to acknowledge, however, that we are a long way from having the methods, techniques, and theories required to make a systematic analysis of the component skills involved in reading and writing. Considerable progress has been made in identifying components in decoding activities and, more recently, in the higher-level intellectual skills involved in controlled reading tasks under laboratory-like or highly constrained classroom conditions. (See especially the reports of The Center for the Study of Reading, Note 2). Sticht, Fox, Hauke, and Zapf (1977) have used the skills-analysis approach to reading activities outside the classroom and have distinguished between reading-to-do and reading-to-learn activities. The long-range objective is to devise methods for an adequate description and analysis of skills in out-of-school literacy practices that can be coordinated with the micro-level analyses of laboratory studies.

Both educational practice and research might benefit from a recognition of the complex interrelationships between mental skills and literacy activities. Terms that refer to oral and literate modes of thought, although historically significant, are not useful characterizations of the mental abilities of nonliterate and literate adults in American society; in fact, most research with adults in traditional societies confirms their inappropriateness for any contemporaneous culture. Thus research does not support designing adult literacy programs on the assumption that nonliterates do not think abstractly, do not reason logically, or lack other basic mental processes. In each case, the skills available for learning how to read and write or for improving rudimentary literacy abilities need to be assessed with

respect to the accomplishments nonliterates display in other activities—for example, disputation, hypothetical reasoning, or oral narrative. To the question posed at the beginning of this paper—"Is a college student's incoherent essay symptomatic of faulty reasoning?"—our answer would be, "No, it is not a symptom; it is a sign to be evaluated."

If different literacy activities are linked to different intellectual outcomes, a second implication of our research is that reading and writing activities need to be tailored to desired achievements. These outcomes can be defined in terms of the literacy competencies required for participation in our highly technological society, but they need not be defined in narrowly pragmatic terms, reflecting merely the current demand for job security or advance. A skills approach might make it possible to identify a common core of skills that will enable an individual to master more intellectually demanding reading and writing tasks after completing the school curriculum or literacy program. If the educational objective is to foster analytic logical reasoning, that objective should guide the choice of instructional program. It should not be assumed that these skills will follow inevitably from practice in writing essays. Writing essays may be helpful, as may oral practices. This is undoubtedly the common wisdom of the classroom and the educational planner. But it would be helpful to ally this wisdom with the psychological literature on literacy so that the broad conceptual framework informs teaching practice and practice informs the theory.

We realize that the kind of program implied by our discussion may seem difficult to attain. The comments of the Soviet psychologist Vygotsky (1934/1978) some fifty years ago on the status of the specific-skill versus mental-development argument of his day offer useful guidance for our research choices today: "Such a matter cannot be dealt with by a single formula of some kind, but rather suggests how great is the scope for extensive and varied experimental research" (p. 34).

Reference Notes

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