MIND as Cultural Achievement

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What people become is largely a function of what they have an opportunity to experience. In this sense, our minds are products of the kinds of tools that are made available to us during maturation. This view of mind, as something made rather than given, is an optimistic one. It implies that educators have a special opportunity to influence the ways in which the young come to regard the world, to influence the kind of sense they make of it, to affect the kinds of categories, attitudes, and meaning that they secure from their experience.

Sensory Systems and the Forms of Representation

Basic to any understanding of the mind is the importance of understanding the functions that the sensory systems perform in the realization of consciousness. If to be conscious is to be aware, then it follows that consciousness requires a subject matter. That subject matter is found in our ability to experience our environment, or to experience those images we generate in the privacy of our covert mental life. Our sensory system performs an active role in this process by putting us in contact with those realms of the world to which they are sensitive.

If the nerve endings in our fingers were severed through an accident, our ability to experience the feel of things and hence to be conscious of them would not be possible. If our optic nerve was cut we would lose the experience of sight. If our inner ear was damaged, our ability to experience sound would be lost. These observations are, in a sense, obvious once we think about them. But their meaning for education and their role in the achievement of mind is not.

The sensory systems provide the experiential options that every normal human being can use, but they are options that require more than simple maturation in order to fully function. They require the kind of cultivation that is represented by their highest level of achievement in our culture. The educational development of the sensibilities is not an automatic consequence of maturation.

The child's ability to use the senses as mechanisms for the articulation of thought can be legitimately regarded as a form of literacy. By literacy I do not mean simply being able to read or to write or to cipher, but rather being able to secure or express meaning through what I shall call *forms of representation*. Literacy may be regarded as the generic process of being able to "decode" or "encode" the content of these forms. Because conception and expression are as diverse as any of the sensory modalities humans can use, literacy can be employed, developed, and refined within any of the forms of representation the sensory systems make possible.

If my emphasis on the centrality of the senses in the realization of mind appears to suggest that the sentient human is a passive receiver of sensory information, I wish now to disclaim such an implication. What the sensory systems provide are options for experience, avenues for consciousness. There is no guarantee that such options will be taken or that the consciousness they make possible secured. On the contrary, there is much evidence to suggest that most of us are only partially literate, that we do not know how to experience much of what either nature or culture makes possible. Part of the task of education

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The language of thinking includes images as well as words. Development of literacy requires education of the senses.

—and I would suggest one of its most important tasks—is to foster such literacy. Without it life is only partially lived; if partially lived, then in one sense, we are only partially alive.

The failure to develop the forms of literacy the senses make possible can result from two conditions. The most radical and the rarer of the two occurs in drastic forms of sensory deprivation. The realization of what is biographically latent requires, we have learned, an environmental trigger. Without certain nutrients during infancy, growth will be irreversibly stunted.

Although sensory deprivation is an important cause of illiteracy, perhaps the major cause is the failure of schools to provide the kinds of programs that would make literacy possible in the first place. Sensory qualities are almost always subtlely arranged: there is more to see, hear, taste, and feel than meets the unprepared mind. To secure the experience that is potential in the sensory events that constitute the world, we must learn how to have such experience. Even among things natural—trees, mountains, landscapes, and the like—qualities do not speak for themselves. One must bring to them, as it were, a receptive attitude and an inquiring mind. One must ask to receive.

When we deal with the products of culture rather than nature the task is even more complex. Cultural forms of representation are intentionally patterned, are a consequence of purpose, possess a past, and participate within a tradition. These patterns or configurations constitute the syntaxes through which meanings are conceptualized and shared. Being literate within these forms means being able to perceive their subtle qualities as well as being able to cope with their syntax. The level of subtlety and complexity that such forms of representation possess requires a level of literacy that is equal to them. To put it more simply, great cultural forms in the arts as in the sciences, demand great audiences.

I said that the forms of representation that are available in the culture are not only patterned forms, but also possess a syntax. The word syntax is derived from the Latin *syntaxis* which means "to arrange." The arrangements that forms such as mathematics and formal speech and text take can be distinguished from those that are taken by vernacular speech, poetry, the visual arts, music, and dance. One of the major differences is that the use of number, to consider a paradigm case, is controlled by prescriptive rules that are formally codified, while the syntaxes of the arts, to use a contrasting example, have no comparable formal codifications. Room is left for personal ingenuity in arrangement.

One of the major pedagogical tasks in the teaching of arithmetic, or spelling, or punctuation, or grammar is to enable students to learn how to follow the formally codified rules that govern the use of elements within these fields. There are, after all, only two ways to spell a word in the English language and virtually all of mathematics from elementary through secondary school consists of problems whose answers are known and whose procedures are to be learned so that the students' answers and the teacher's will be the same.

The acquisition of those skills that make correct responses possible in such fields has, of course, certain virtues. When rules are codified and explicit as they are in the three Rs, ambiguity can be reduced, precision can be increased, and the security of knowing when one is right or wrong obtained. If the syntax of a form of representation is highly rule-governed, it makes it possible to reduce idiosyncratic interpretations, if not to eliminate them altogether.

Precision and predictability are virtues for some tasks, but not for others. In the arts, for example, rules

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are not codified, they are seldom explicit, and they admit—indeed they encourage—the pursuit of personal ingenuity. The arts encourage the use of imagination and value productive idiosyncracy. In artistic forms of representation cognitive skills different from those used in rule-governed forms of representation are cultivated, tolerance for ambiguity is fostered, and the ability to exercise judgment prized.

To distinguish between the syntactical structures of forms of representation that are highly rule-governed and those that are less so is not to suggest that one is educationally valuable and the other is not. The existence of differing forms of representation in culture testifies to their distinctive utility for enabling humans to conceptualize and convey to others the kinds of meanings they wish to express. If we assume that the capacity for meaning is diverse within us and common among us, then it seems reasonable to assume that the forms of representation that we have invented are a product of our need to give expression to what our nature makes possible. Music and mathematics, to take two examples, exist because they are the only vehicles through which the meanings they make possible can be created.

Given this general view of meaning and mind, two specific points need emphasis. First, while the capacities for meaning are a part of the biological constitution of the human organism, the extent to which those capacities are actualized depends upon the forms of representation that humans learn to use. For a great many such forms the opportunities for their use are available as a normal part of socialization. Vernacular speech is the most obvious example. No normal child fails to learn to speak. However, the level of competence with which speech is used without special tuition seldom exceeds the level found in the culture at large. And in general these levels are not particularly high. *TV Guide* is a stunning index in this regard.

Second, the kind of meaning that individuals are able to secure from their experience is directly related to their ability to use the forms of representation that are available. These forms are, as I have suggested, nonredundant. What one can say and experience in prose is not possible in poetry, and what is possible in poetry is not possible in mathematics. What is possible in mathematics is not possible in dance. No literal translation from one form of representation to another is possible without some loss of meaning.

Thus far I have described the sensory systems and the forms of representation as if they function independently. In fact, they interact and feed off each other in both our private imaginative life and in the forms we use to make that life public. For example, we have the ability to conceptualize not only in each of the sensory modalities—we can visualize, we can recall and create auditory concepts, we can engender imaginatively taste and touch as well as number and word—but we are also able to experience concepts in these forms simultaneously. It is no great feat to be able to hear a melody while experiencing a mental image. Indeed, with practice we can hear music, speak sentences, and see images all at the same time. This ability allows us to rehearse activities mentally prior to acting on them empirically. I suggest that our ability to engage in such rehearsal is educable: we can improve our ability to construe such mental images if we have the opportunity to learn to do so.

But there is another way in which our ability to form concepts affects the nature and quality of what we can express. Our mode of conceptualization need not necessarily be the mode of expression. Writing is a prime example. For a writer to have a content to express, the writer must first be able to experience the world he or she intends to write about. This experience is not initially verbal. It is, at first, qualitative. From experience with the qualitative, the content for the expression is born. The task of the writer, in part, is to make vivid his or her experience, that is, to accomplish the miracle of transforming qualitative experience existing in one realm into an arrangement of words which succeed in saying what words can never say. The writer starts with vision and ends with words. But the reader, while starting with words, ends with vision. Similarly, visual artists may start with words—a manifesto of political beliefs as did the futurists, or a theoretical intrigue with the unconscious as did the sur-

realists—and from words end with visual images. The forms through which humans think are not condemned to solitary confinement within their own cells. The mind is a social entity.

The argument I have tried to make thus far has five parts:

First, the sensory systems make it possible to contact and portray the world in different ways. I have called these modes of portrayal "forms of representation."

Second, these forms of representation are available in the culture at large and function as means through which we conceptualize, express, and recover meaning.

Third, to become literate in a wide sense means more than to be able to read, write, or cipher. It means being able to use a variety of forms of representation for conceptualizing, expressing, and recovering meaning.

Fourth, since each form of representation emphasizes the use of different sensory systems and employs a different syntax, the kind of meaning that each provides is unique. What can be expressed in one form is not expressible in another.

Fifth, at present, schools neglect the development of literacy in many of the forms of representation that are available in the culture. This neglect denies children access to meanings that are specific to particular forms and adversely affects the kinds of meanings they can express in the forms that they are taught in schools.

In developing this argument I have taken something for granted that should be confronted directly. I refer to the generally held belief that the concept of literacy can only be applied to what is truly a language and that the only true languages are speech, text, and number. Furthermore, thinking itself, it is argued, can only be mediated by language. Thus to talk about thinking within or through forms of representation that are not governed by the rule of logic is either to speak of language metaphorically or to seriously misunderstand the fundamental nature of thought. One writer, Adam Schaff (1973) puts the case this way:

> When we adopt the monistic standpoint, we reject the claim that language and thinking can exist separately and independently of one another. Of course, we are talking about specifically *human* thinking, in other words about *conceptual* thinking. Thus we assert that in the process of cognition and communication, thinking and using a language are inseparable elements of one and the same whole. Integration is so perfect and interdependence is so precise that neither element can ever occur independently, in a "pure" form. That is precisely why the functions of thinking and language may not be treated separately, let alone contrasted with one another.

It seems to me a strange view of thinking to limit it to verbally or mathematically mediated activity. Such a view implies that painters, composers, athletes, and all others whose medium of expression is nonverbal or nonmathematical first must think in verbal or mathematical forms before they are able to translate them into the qualities and actions that constitute the works they create.

This hardly squares with common experience or with the reports that such individuals make about their own cognitive processes. But perhaps the activities of artists and the like are really not a function of thinking at all. But if this is the case, what are they a function of? Inspiration, per-

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haps, catharsis, a touch by the Muse. These explanations hardly seem adequate. Even Chomsky (1973), who staunchly advocates the view that the human's capacity for language is a genetic and uniquely human aptitude, suggests that thinking is not limited to language:

> Is it the case, for example, that humans necessarily think in language? Obvious counter-examples immediately come to mind. Our only evidence of any substance is introspective; the introspection surely tells me that when I think about a trip to Paris or a camping expedition in the Rockies, the few scraps of internal monologue that may be detected hardly convey, or even suggest, the content of my thought. In struggling with a mathematical problem, one is often aware of the role of a physical, geometrical intuition that is hardly expressible in words, even with effort and attention. . . .

Thinking, Chomsky suggests, is not only *not* limited to language as it is conventionally defined, but nonlinguistic forms of thinking may underlie the activity of those whose work is eventually expressed in words or numbers. Indeed the history of science is filled with individuals whose self-reports indicate that nonverbal thinking was central to the solutions they were seeking. A view that limits thinking to what is verbally or mathematically mediated, it seems to me, must either be limited or must be obliged to use the concept as a special case of a larger more generic cognitive process. Dewey (1934) put the issue beautifully in *Art as Experience:*

> Any idea that ignores the necessary role of intelligence in production of works of art is based upon identification of thinking with use of one special kind of material, verbal signs and words. To think effectively in terms of relations of qualities is as severe a demand upon thought as to think in terms of symbols, verbal and mathematical. Indeed, since words are easily manipulated in mechanical ways, the production of a work of genuine art probably demands more intelligence than does most of the so-called thinking that goes on among those who pride themselves on being "intellectuals."

Enough said about thinking, but what about the notion that the concept of language can and ought to be extended to include forms of representation that do not use words or numbers. Here the problem becomes a bit sticky. The term language is derived from the Latin "lingua" and is thus etymologically derived from speech or "tongue." When people speak of language they typically mean speech or text. Because of the highly rule-governed character of mathematics, it, too, is brought under the umbrella of language. Indeed, to be numerate is to be literate in number.

Except for the specialized term semiotics we do not have in the English language a generic term that includes all forms of patterned expressions that convey thought. Because of this deprivation in our own discursive language, I wish to extend the concept of language so that it exceeds its conventional meaning. If language is regarded as a vehicle that makes it possible for humans to conceptualize and express what they think, and if through such expression communication occurs, then forms beyond speech, text, and number qualify as nondiscursive forms of language.

Perhaps the clearest examples of this are, paradoxically, located in written language itself: literature and poetry. The communicative content of these forms of expression is surely not limited to their literal meaning. Indeed, the literal as contrasted with the figurative reading of literature and poetry is their anathema. And for the figurative there is no rule-governed syntax comparable to those used in mathematics or formal discursive expression. If a form of representation must use a formal, codified, rule-governed syntax in order to

qualify as a language, we must either say that literature and poetry are not examples of language and do not communicate, or revise our conception of language.

Forms of Representation and Their Meaning for Education

Because readers of this journal are interested in the improvement of education, perhaps now it would be well to say something about what the concept of mind as cultural achievement might mean for the goals of education, for the content of the curriculum, for the processes of teaching, and for the ways in which we evaluate.

The goals of education. I believe that one of education's major aims should be the cultivation of the student's literacy as I have described it. I embrace such an end-in-view for schools because I believe education ought to expand the varieties of meaning students can experience. Many of those meanings are to be found in the great cultural forms of the world. Access to these forms depends upon the student's ability to "read" their contents.

I value the cultivation of wide forms of literacy not only because I believe the great works of art and science ought to be accessible to students, but because the acquisition of such literacy makes it possible to read the environment at large. Making sense of the world requires an ability to give it form, to perceive and grasp its expressive patterns, in short, to read what it means. One learns how to read phenomena that were never intended to be communicative as well as those forms that were. Indeed, it is the ability to construe meaning from the forms of nature as well as culture that the forms of art and science are made. The forms of representation that people learn to use provide the concepts and schemata for constructing such meaning.

The content of the curriculum. If what I have said has merit, it would mean that the schools would allocate time so that students have the opportunity to develop the varieties of literacy I described as important. At present they do not. If one uses time as an index of what is important in school, there is no question where priorities lie. About 70 to 85 percent of the time allocated for instructional purposes in elementary schools is devoted to teaching the three Rs. The arts, by contrast, take up from 2 to 4 percent of instructional time per week, the sciences somewhat more, and the social studies slightly more than the sciences. A curriculum that does not give students the opportunity to become literate in certain forms of representation handicaps their ability to use other forms of representation. We write as much with our eyes and ears as we do by following the rules of grammar and logic. Children who do not learn to see will not be able to write, not because they cannot spell, but because they will have nothing to say. And if they are unable to hear the cadence, tempo, and melody of what they write, it is likely to be mechanical and stilted. At a time in which schools are being asked to narrow their focus, I would urge them to expand their focus. The creation of a balanced curriculum is one of the most pressing curriculum problems of the day.

The processes of teaching. The likelihood of developing broad forms of literacy among students depends upon having teachers who themselves are broadly literate. For teacher preparation this means at least three things. First, during the course of the teacher's general education the skills needed to recover different forms of meaning should be developed. It is not likely that a teacher will be able to be critical or pedagogically helpful in realms that the teacher does not understand. Second, prospective teachers also need to understand the nature of the forms of representation they teach, that is, to be able to distinguish between the ways in which propositional and nonpropositional forms communicate, to grasp the distinctive ways in which time, for example, is used in the novel as compared to the dance, to appreciate the function of color in painting as contrasted to its use in music.

Third, in the course of teaching it would be well if teachers developed the skills needed to help students learn how to treat problems using different forms of representation. What can be said about history through drama or through visual images that is not likely to be said in didactic prose and vice versa? The ability to use different forms of representation should broaden the options students have to display what they have learned and should also allow some youngsters to shine in ways that expression limited to writing might not make possible. If the mind, for the moment, can be likened to a great supermarket containing wide varieties of food, then does it not seem restrictive to limit the young to two or three aisles? There are foods in other places that are worth tasting.

Ways we evaluate. I would urge that we support and expand current efforts to broaden the ways we evaluate. Conventional modes, particularly the use of achievement tests, are designed to capture only a slender slice of educational life. Yet, the results of their use have substantial consequences for the schools. To use such devices as the exclusive tools for evaluation is like casting into the sea a net that is designed to let the most interesting fish get away.

Film, descriptive narrative, artistically rendered prose, graphic displays of children's works, interviews, and the like all have something unique to tell us about the processes of education and their consequences. Our understanding of the effects of education should not be limited to what can be revealed by digits carried to the third decimal place.

The mind is an achievement that evolves not simply in the genetic sense, but in the cultural sense as well. As educators we have the privilege of celebrating its possibilities and contributing to its achievements. The exercise of that art—the art of education—as Dewey (1974) himself said, "is the most difficult and most important of all human arts." ■

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