

other new members into cultures is largely accomplished by their imitation of mature members' culturally organized but unreflective acts. Most traditional and pre-technological cultures teach their offspring largely through modeling, rather than through a verbal emphasis (Scribner & Cole, 1973). These acts of modeling take place during activities created by the family's ecocultural niche – working the fields, caring for domestic animals, collecting and preparing food, caring for children, weaving, and other such tasks. Children take part in these activities through a process of guided participation (Rogoff, in press), in which opportunities to learn through modeling are seamlessly woven into subsistence and family maintenance, the fabric of everyday life.

Many parameters of the modeling/imitation process are now well known (Bandura, 1977). Whether or not imitation of models will occur is affected by the comparative age and sex of modeler and imitator; the presence of reinforcement for the behavior; whether or not the model is live or depicted; relationship factors among the actors; the generalized repertoire of imitation itself, which can be strengthened or weakened by reinforcement and punishment (Staats, 1968); and many other factors, all of which are complexly interactive.

Modeling is a powerful means of assisting performance, one that continues its effectiveness into adult years and into the highest reaches of behavioral complexity. In the educational setting, both expert teachers and peer models are highly important sources of assisted performance, for children and adults alike.

*Contingency management.* Contingency management is the means of assisting performance by which rewards and punishments are arranged to follow behavior, depending on whether the behavior is desired or not. It is composed of a set of techniques so well known by now that few readers will need another explication. Review can be had on a research level from Bandura (1969), or on the level of practice from Tharp and Wetzel (1969).

All manner of rewards have been used in contingency management – the social reinforcements of praise and encouragement, material reinforcements of consumables or privileges, tokens and symbolic rewards. In most educational prescriptions, punishments are restricted to the loss of some positive opportunity or to brief, firm reprimands. In effective teaching, contingency management is focused on positive behavior and positive rewards. When these prescriptions are followed, classrooms that employ contingency management as a means of assistance are productive and pleasant in emotional tone.

Widespread use of contingency management in the 1960s and 1970s led to many incompetent applications and considerable opposition to the concept – some in response to the mechanistic, reductive theory of conditioning by which contingency management was often and inappropriately justified. This is unfortunate because contingency management is not operant conditioning (Homme, 1966; Tharp & Wetzel, 1969). The effects of contingencies on behavior are strong; but they do not need to be explained by operant conditioning and indeed are as well explained by philo-

*Instructing.* Instruction is surely the most ubiquitous of all the means of assisting in ordinary life. Compliance with instructions is not inevitable, since effective instructions must be embedded in a context of other effective means, notably contingency management, feeding back, and cognitive structuring.

In typical educational settings, instructions are used primarily in two contexts: on matters of behaviour and in assigning tasks. It is unfortunately rare to see instructing used to assist the performance of the next specific act needed to move through the zone of proximal development. Instructions, like other forms of assistance, can be expected to occur only when teachers assume responsibility for assisting performance rather than expecting students to learn on their own.

Of course, too much instructing can be obnoxious to a learner. A measured use of instructing, however, does not create opposition. And it is important that instructing be included in teaching, because the instructing voice of the teacher becomes the self-instructing voice of the learner in the transition from apprentice to self-regulated performer. The noninstructing teacher may be denying the learner the most valuable residue of the teaching interaction: that heard, regulating voice, that gradually internalized voice, which then becomes the pupil's self-regulating "still, small" instructor.

*Questioning.* Questions assist performance in ways that lie below the surface. This point can be made by comparing the ways that questions assist and the ways that instructions assist. Ervin-Tripp (1976, 1977) considers both instructions and questions as subclasses of directives. For example, we may say to a child, "What flowers did you see yesterday?" or we may say, "Tell me what flowers you saw yesterday." These are functionally equivalent means of assisting the child by requiring recall and categorization. At one level of analysis, the question contains the implicit instruction, "(tell me) or (think of) what flowers did you see." According to Ervin-Tripp (1976, 1977), whether this regulation is phrased explicitly or not is a matter of courtesy, or role regulation, not of the process per se.

However, there are important distinctions between questions and instructions in the context of teaching. If the speaker wants action but phrases the directive as a question, "misfires" are a likely result (Ervin-Tripp, 1976, 1977). "Will you dance?" and "Dance!" are not the same, in that the interrogative form, in linguistic logic, *requests a reply in language*. If the dancers are asked "Will you dance?" they might shout "Yes!" but stand still. The instructional form "Dance!" requests a reply in action.

Questioning, in contrast to instructing, provides a distinct and valuable means of assisting performance. Questioning explicitly calls for an active linguistic and cognitive response: It provokes creations by the pupil. A teacher can either ask "What is the meaning of 'democracy'?" or give a lecture on the subject. If the teacher questions, two teaching advantages are gained. First, there is the mental and verbal activation of the pupils, which provides them with practice and exercise. Second, during this exercise of the pupils' speech and thought, the teacher will be able to

assist and regulate the students' assembling of evidence and their use of logic. If the teacher only lectures, he or she will never know what the students are thinking (Tharp & Gallimore, 1988).

Not all questions assist performance. We must distinguish those that assist, from those that merely assess. Durkin (1978–1979), Hoetker and Ahlbrand (1969), Duffy and Roehler (1981), and Tharp and Gallimore (1988), among others, have noted the predominance of the assessment type in typical classrooms. We have already described assessment questions as the major interaction component of the recitation script. The *assessment question* inquires to discover the level of the pupil's ability to perform without assistance. When such questions are used to tailor instruction to the student's point in the zone of proximal development (ZPD), they are one part of competent instruction.

However, most teachers do not distinguish questions that assess from those that assist. This results in the teacher assuming that a request for information constitutes teaching. It does not. Though necessary to teaching, assessment is not itself a means for directly assisting performance. The *assistance question*, on the other hand, inquires in order to produce a mental operation that the pupil cannot or would not produce alone. The assistance provided by the question is the prompting of that mental operation.

*Cognitive structuring*. As a means of assisting performance, cognitive structuring refers to the provision of a structure for thinking and acting. It may be a structure for beliefs, for mental operations, or for understanding. It organizes, evaluates, and groups and sequences perception, memory, and action. In everyday life, cognitive structures may be more or less formalized, more or less conscious.

From the point of view of the teacher, various kinds of cognitive structures can be provided. They can be grand: world views, philosophies, ethical systems, scientific theories, and religious theologies. Or they can be as modest as giving a name to a thing.

A simple but useful distinction among kinds of cognitive structures can be offered: Type I, structures of explanation, and Type II, structures for cognitive activity. Type I may be an explanation that molecular activity increases with temperature as gases expand in a third-grade experiment. Or the teacher may say that the story for today is about heroes. In such cases, structure serves to organize perception in new ways. Ice and steam fall into the new science structure. In reading the new story, the readers can group their own feelings of admiration toward some others with the judgment of history on national figures. Evaluation, grouping, and sequencing of both old and new information are performances assisted by these newly developed cognitive structures.

Type II structures operate on the level of cognitive process. Children may be given structures for memorization, or for recall, or for rules for accumulating evidence, as in the following example: "So, whenever you are reading any place and you come to a word that is new to you and you are not sure what the word is, you

dosage of instructions and incentives does not cure, employees or recruits can be dismissed. Perhaps because such institutions have a limited commitment to teaching, they rarely conceive their relationships to personnel as "teaching through assisting performance."

Regrettably, schools are too much like this general description of organizations. Schools also accept highly limited responsibility for assisting the performance of their personnel. This is paradoxical, since teaching is the sole formal purpose for the existence of schools, and thus schools bear a unique relationship to the act of teaching.

Therefore, schools should be in a position to understand a corollary of our theory of teaching: *A primary operational principle for schools should be to assist the performance of all their members, from kindergartners to superintendent.* Sadly, it is not so.

### *Organizing schools for teaching*

Little actual teaching occurs in schools; this is characteristic of transactions within the entire educational apparatus. All the way down the educational ladder, teaching is peculiarly absent in transactions between children and teachers, teachers and administrators, students and professors. Each appears to believe that, somewhere below, someone is teaching someone. Each position attempts to create educational opportunities for those down the chain – good textbooks, good workshops, even good performance objectives – but no one attends to assisting the performance of those objectives.

Rather than assisting performance, the supervision usually means direction and evaluation. *This is organically related to the classroom practice of directing and assessing: the recitation script.* At neither level is there sufficient assistance, responsiveness, joint productive activity, or the building of common meanings and values. One reason why the recitation script is so firmly entrenched in the classroom (cf. Hoetker & Ahlbrand, 1969; Goodlad, 1984; Tharp & Gallimore, 1988) is that it is ubiquitous in the school.

An alternative model of supervision and school organization grows from the concepts discussed in this chapter. One of the duties of each individual in a school system should be to assist the performance of the person next down the line: The superintendent assists the principal, the principal assists the teacher, the teacher assists the pupil. It is surely reasonable that the central responsibility of the teaching organization should be providing assistance for the performance of each member. X This assistance, with its accompanying cognitive and behavioral development, is the justifying goal of the school, and all other duties should be in its service. Supervision itself should be defined as assisting performance in precisely the terms we used to define teaching.

In this way, the superintendent can indirectly affect the work of teachers by assisting the principal to assist them. The primary responsibility of principals (or

Gallimore, 1988; Weisner, 1984; Weisner & Gallimore, 1985; Wertsch, Minick, & Arns, 1984; Whiting & Whiting, 1975).

The name *activity setting* incorporates the two essential features: the cognitive and motoric action itself (activity); and the external, environmental, and objective features of the occasion (setting). They are the who, what, when, where, and why, the small recurrent dramas of everyday life, played on the stages of home, community, and workplace. All these features – personnel, occasion, motivations, goals, places, and times – cannot be unpackaged without drastically reducing the explanatory and practical utility of the concept of activity setting. It is true that social science has always separated these features, and consequently the concept requires some practice before its use is comfortable (Tharp & Gallimore, 1988). But all settings for activity in the school can be analyzed in these terms, from work centers in classrooms to independent teacher self-study groups.

#### *Examples and principles of activity settings in the schools*

Examples of important activity settings for students include whole-class settings, laboratory partnerships, cooperative-learning small groups, debates, drama rehearsals. Activity settings for adult members of school organizations include faculty committees, peer coaching groups, workshops, individual teacher consultation by outside experts, grade-level committee meetings, curriculum revision groups. We will exemplify the concept by discussing two activity settings in detail; one is designed to assist the performance of students, and the other assists the performance of teachers. Both examples are drawn from work at the Kamehameha Early Education Program (KEEP; see Tharp & Gallimore, 1988).

*Center One.* Center One accomplishes assistance of child learning by creating an activity setting in the classroom that maximizes opportunities for coparticipation and instructional conversation with the teacher. Center One is the central activity setting at KEEP for the teaching of literacy to children from kindergarten through third grade. It is the focal point of teacher-child interaction. The specific activities vary from one group to another and from day to day, but in each the children and teacher are engaged in a lively instructional conversation. The Center One lesson teaches not only reading but also listening, speaking, and thinking. The basic goal of instruction is the development of cognitive/linguistic abilities.

This direct daily instruction occurs in homogeneous ability groups of five to six children. The most common pattern is highly informal mutual participation by the teacher and students, co-narration, volunteered speech, instant feedback, and lack of penalty for “wrong” answers. (However, for vocabulary and decoding teaching, the pattern may be highly teacher-dominated, almost drill-like.)

During instruction in comprehension, the teacher follows a pattern of repeated thematic routines, labelled “E-T-R sequences” (Au, 1979, 1981). The teacher introduces content drawn from the child’s experience (E), followed by text (T) ma-

effective activity settings is *jointness* (Tharp & Gallimore, 1988). Without jointness, the supervisor cannot assist performance, affect cognitive structures of learners, or be affected by the emerging group intersubjectivity.

In schools' activity settings, there is too seldom a product at all. This removes another basic condition needed for good functioning of any human group. The activity of a group, the helpfulness of members to one another, the motivation to participate in the activity – all these indispensable conditions are, in ordinary life, *driven by the product itself*. When a curriculum specialist asks, “What can I do to assist this teacher to become a better assister of his students?” one answer is: “Find a time and a place to work together, on a product that we will both value, and through which we can come to a common and advancing understanding.” When that time and place are identified, the specialist will have begun to identify the teacher's zones of proximal development (for content, pedagogy, planning, etc.) and will have some idea of what means of assistance to employ and in what order.

Four basic principles can guide school personnel in evaluating and improving the structure of activity settings. First, the assister should at all times participate in at least one activity setting with the assistee(s). Second, the authority of the assister should be used to organize activity settings and to make resources of time, place, persons, and tools available to them. Third, authority should not override the emerging intersubjectivity and problem solving of the activity's members. Fourth, every member of the school community should be engaged in some setting of joint productive activity.

After sketching the theory of teaching, and the theory of schooling, we are now prepared to consider the third leg of a theoretical tripod: the theory of literacy.

### A theory of literacy

Schools should teach students to be literate in the most general sense – capable of reading, writing, speaking, computing, reasoning, and manipulating verbal (and visual) symbols and concepts. Together, the three theoretical legs of teaching, schooling, and literacy support a theory of education. The term *three legs of a tripod* emphasizes the interconnectedness of these considerations: If one collapses, all fall down.

For each of the legs of this theory of education, there is a crucial concept. For the theory of teaching, the zone of proximal development is the cornerstone. For the theory of schooling, activity settings are key. For a theory of literacy, the key Vygotskian concept is word meaning.

#### *Word, discourse, and meaning*

Vygotsky considered *word meaning* the basic unit for the analysis of consciousness, because word meaning is both an intramental and an intermental phenomenon. Word meaning is the stuff of verbal thinking. It also resides in the community of language

1985a). A *system* of words develops, with units of decontextualized words, rules of use, rules of transformation, and an emphasis on these internal relationships.

Vygotsky argues that the unique route to higher-order verbal thinking is the experience of schooling. *Schooling detaches the word from its designatum and attaches it to a generalization.* This shift is of profound importance because *only if the word is freed of its sensory impedimenta can it be manipulated voluntarily and with conscious awareness.* Written speech must have more words, be more precise, and be more expanded than verbal speech, because it cannot rely on paralinguistic elements such as tone and gestures. This enforces an experience of language as system. This systematicity – self-contained and self-sufficient – is what allows language to be unhooked from the sensory world, to be taken in hand by the thinker, to be used as a tool for thought (Tharp & Gallimore, 1988).

X The “system” of written discourse is far different from that used in practical activity settings of home and community. Vygotsky points out that everyday concepts are learned primarily through speech; schooled examples are learned primarily through written symbols. Everyday concepts are learned “upward” from sensory experience to generalization; schooled concepts are learned “downward” from generalization to palpable example.

The course of development of higher mental processes lies in bringing the two together, in allowing the synthesis of the opposites. Schooled concepts connect with the experienced world through the everyday concepts that have arisen through practical activity. Relating the two enriches and saves schooling from aridity; but this relating also profoundly changes the nature of the everyday concepts, making them more systematic, autonomous, and tool-like. Of course, everyday thinking continues, permanently. But the relating of the domains of everyday concepts and the system of schooled concepts requires the learner “to attend to aspects of linguistic activity that had earlier been mastered without conscious awareness” (Minick, 1985, p. 365). Their conjunction illuminates both.

Thus the dialectic between everydayness and the systematic tools of schooled discourse gives rise to consciousness of these symbols and makes possible their use in practical thinking. The instructional task of the school is to facilitate that developmental process by teaching the schooled language of reading and writing and facilitating the constant conjunction of these systems with those of everyday concepts (Tharp & Gallimore, 1988). “Effective instruction with young children involves a continuous integration of language and action” (Wood, 1980, p. 290).

Effective school instruction must provide the interface between emergent schooled concepts and everyday concepts. Only in this way will the highest order of meaning be achieved, and only in this way will teaching ensure that tools of verbal thought will be manipulated for the solution of practical problems of the experienced world. Reading and writing prepare the child for receiving schooled concepts. Reading is both the condition and the process of acquiring meaning. To learn to read is to learn to comprehend, and to teach reading means to teach comprehension.

*Teaching reading and comprehension*

Comprehending text means the weaving of new, schooled concepts with those of everyday life, a process that Wittrock (1974) described as generative. In Wittrock's conception, comprehension is "a function of the abstract and distinctive, concrete associations which the learner generates between his prior experience, as it is stored in long-term memory, and the stimuli" (1974, p. 89). Text becomes meaningful because it has become woven into the student's *system* of meanings and understandings. Extracting information from text, arraying and preparing it for weaving into existing cognitive systems are basic competencies that literate societies transmit. School-based instruction in comprehension of written text is our basic system for establishing the discourse meanings that create both the intermental and intramental capacity for verbal thinking (Vygotsky, 1987).

At the earliest levels of instruction – for children whose emergent literacy experiences in the home have been limited – it is necessary to build those cognitive competencies that are fundamental to eventual text comprehension. For the very young child, or for the child without early interactions with schooled parents – it is necessary first to build word meanings on the everyday, verbal level and to introduce gradually the linguistic stream of writing itself.

Thus comprehension is established by the weaving of new, schooled concepts with the concepts of everyday life. Textual material becomes meaningful because it has gained a new attachment – it is now hooked by *sense* to everyday concepts and hooked by *system* to the whole structure of meaning given by schooling. The homely "weaving" heuristic used by reading teachers is not only a short-term instructional strategy. Indeed, it is used consistently in the highest reaches of scientific and philosophical thought. Theoretical thought and discussion require a continual freshening by example and a testing against sensory data. This constant connecting of schooled concepts and everyday concepts is the basic process of understanding the world used by mature schooled thinkers.

The weaving of the schooled with the everyday is not only enhancing to the dialectical growth of concepts but also motivating. For example, we know that the *discourse of science* occurs in a particular register, with its distinct rules and formalities. In the *teaching of science*, however, these conventions are frequently violated by the interpolation of everyday discourse. These alternations are unmistakable, ordinarily being marked by tone of voice, laughter, asides, and so on. During these times, the attention of students is at its highest (Cazden, 1987; Lemke, 1982).

"Formal schooling is a place where the child is drawn into unique modes of social interaction and thinking that have their roots in the history of Western science and philosophy" (Minick, 1985, pp. 367–368). From kindergarten to graduate seminars, the small discussion group where text and personal understanding can be compared, discussed, and related is the prime opportunity for this "unique social interaction."

There is another irony: Most teachers are members of the literate middle class, where researchers have most often found the instructional conversation. Why, then, is this interactional pattern so seldom observed in classrooms run by teachers who talk to their own children in this way?

There are at least two main reasons. First, a teacher cannot provide assistance in the ZPD unless she knows where the learner is in the developmental process. Opportunities for such careful observation of the child's in-flight performance are rarely available in typical American classrooms. In individual tutorials, in private schools with classes of seven or less, such intimate knowledge of the learning process may be possible. But all involve a pupil-teacher ratio that society generally declines to provide. There is some cause for optimism in schools' increased use of small groups, maintenance of positive classroom atmosphere which increases independent task involvement of students, and new materials and technology with which students can interact independently of the teacher. But these positive developments do not speak to the second reason that assisted performance has not diffused into the schools. Although most parents do not need to be trained to assist performance, most teachers do because their task is more complex. Teachers cannot rely on skills that are sufficient for parental socialization of offspring. Lay or parental skills are a foundation, but teachers need a more elaborate set of skills in assistance, and they need to be more conscious of their application.

Teachers do not conduct instructional conversations because they do not know how. They do not know how, because they have never been taught. They almost never have opportunities to observe effective models or occasions for practicing and receiving feedback or for competent coaching by a skilled mentor. Like all learners, teachers themselves must have their performance assisted if they are to acquire the ability to assist the performance of their students. Teachers, like all learners, have zones of proximal development of professional skills. And teachers, like all learners in schools, seldom receive the performance assistance that is required for them to develop.

Teachers need to learn the "expert pedagogy" of which Berliner (1986) and others have written (see various chapters in Wittrock, 1986). They must learn professional skills of assisting performance and learn to apply them at a level far beyond that required in private life. Thus pedagogically expert teachers do not act exactly like parents. The large numbers of pupils, the restricted and technical curriculum, and the complexity of institutional restraints of schooling require that teaching be a highly deliberate, carefully structured, planned, professional activity. Unlike conversations in natal settings, teachers have a deliberate curriculum of literate knowledge and skills to impart.

Nevertheless, working with content-rich curricula teachers can and must move closer to the communicative styles of parents with their own children. What might appear to be "spontaneous" instructional conversations (see, e.g., Tharp & Gallimore, 1988, chaps. 3, 7, 8, 10) are not. We are not advocating casual, drifting classroom chatter. Rather, we mean instructional conversations that require highly

refined interpersonal competencies in combination with a solid grasp of the substantive knowledge to be taught.

Teaching-as-assisted-performance and the arts of the instructional conversation can be taught (Tharp & Gallimore, 1988). We know that these skills are acquired in the interpsychological plane: Teachers acquire these skills through instructional conversations with trained consultants. With assisted performance in teachers' zones of proximal development, these teaching skills of the instructional conversation eventually are internalized and automatized as intrapsychological cognitive processes. These skills themselves are skills of thinking and decision making and are employed regularly and permanently as the skills are plied. In the intersubjectivities developed in instructional conversations, "teaching" takes on a different meaning. To produce these teacher-training conversations requires a different organization of schooling than is found in educational institutions today. It takes a different form of training. The uniting of Vygotskian concepts and perspectives with social and behavioral science provides a basis on which to proceed.

### Conclusions: A unified theory of education

On the whole, contemporary teaching research is atheoretical (Good & Weinstein, 1986), thus suffering from what Price-Williams (1975) called the "Penelope complex," after the wife of Odysseus who each night undid her day's weaving. By unraveling, she put off finishing the cloak – and her promise then to choose among the suitors for her hand and the throne of Ithaca. So too in educational science: the threads of knowledge carded by investigators are not woven into a whole, durable cloak of principles that can be called a theory in the broader sense of the word. And without such a cloak, no new kingdom will come.

Consider "microteaching," a briefly fashionable teacher-training system that soon disappeared from citation indexes, despite ample evidence of its effectiveness (Walberg, 1986). In current discussions about improving teaching and teacher preparation, almost no writers even mention microteaching or make any effort to incorporate and explain the data that movement produced. If the vigorous interest in Vygotskian perspective follows this same pattern, then we can expect in a decade or so that it will be occasionally remembered as another in the long line of discarded educational fashions.

Microteaching is a particularly apt example of a lost thread because it no doubt seems an unlikely topic for this chapter on Vygotsky's contributions to a unified theory of education. It is our brief that a true theory of education must incorporate and account for robust germane phenomena. Microteaching grew out of research on observational learning; it employed modeling, one of the six means of assisting performance in the zone of proximal development. Microteaching works because it activates a fundamental, universal learning process. Microteaching may have lost favor, but the laws of human behavior on which it rests have not changed.

A theory of education must account for and predict how teachers can learn to