Sociocultural studies of mind

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Contents

Series Foreword

This series for Cambridge University Press is becoming widely known as an international forum for studies of situated learning and cognition.

Innovative contributions from anthropology; cognitive, developmental, and cultural psychology; computer science; education, and social theory are providing theory and research that seeks new ways of understanding the social, historical, and contextual nature of the learning, thinking, and practice emerging from human activity. The empirical settings of these research inquiries range from the classroom, to the workplace, to the high-technology office, to learning in the streets and in other communities of practice.

The situated nature of learning and remembering through activity is a central fact. It may appear obvious that human minds develop in social situations, and that they come to appropriate the tools that culture provides to support and extend their sphere of activity and communicative competencies. But cognitive theories of knowledge representation and learning alone have not provided sufficient insight into these relationships.

This series is born of the conviction that new and exciting interdisciplinary syntheses are underway, as scholars and practitioners from diverse fields seek to develop theory and empirical investigations adequate to characterizing the complex relations of social and mental life, and to understanding successful learning wherever it occurs. The series invites contributions that advance our understanding of these seminal issues.

Roy Pea
John Seely Brown

8 Socio-cultural-historical psychology: some general remarks and a proposal for a new kind of cultural-genetic methodology

Michael Cole

Preliminary remarks

Before focusing on the main theme of this chapter, I feel it necessary to say a few words about the current circumstances confronting psychologists who take the social and cultural foundations of human nature as the starting point for their analyses.[1] While such approaches to psychology remain distinctly minority viewpoints within our discipline, it is my impression that they are receiving more attention than at any time since the 1920s and certainly in my professional lifetime. This situation offers pleasant prospects of increased support and recognition. But it also poses dangers: Nowhere are these ideas so highly developed that it is possible to refer to them as a mature scientific paradigm with generally accepted theoretical foundations, a methodology, and a well-delineated set of prescriptions for relating theory to practice. It is my hope that the first meeting of the Society for Sociocultural Research will further the goal of formulating an ecumenical and broadly useful approach to the inclusion of culture and the social world in our theories and practices.

Assuming I am correct about the increasing popularity of the ideas discussed herein, it is possible to identify many causes for this interest: Disenchantment with positivist social sciences more generally, the ero-

sion of support for Piagetian theory among developmentalists, skepticism about the terms in which the study of artificial intelligence is being pursued, despair at the fractionation of psychology, and the search for viable alternatives to various kinds of social learning theory would be some of my candidate factors, but many others could be offered.

One of the leading indicators, if not causes, of this state of affairs is the extraordinary interest that has been shown in the work of L. S. Vygotsky by non-Russian psychologists since the publication of his selected essays in 1978 under the title *Mind in Society*. Despite (or perhaps because of) the well-documented shortcomings of the scholarly work that produced that volume (Bakhurst, 1986; Van der Veer & Valsiner, 1991), the ideas expressed therein seemed to catch the imagination of North American and Western European psychologists. Presently, research characterized as Vygotskian or neo-Vygotskian can be found in dozens of monographs and hundreds if not thousands of journal articles. Vygotsky's classic *Thought and Language* has been retranslated twice, and additional early works are appearing all of the time.

It is something of an irony that just when North American and Western European psychologists were latching on to Vygotsky as a "leading Soviet psychologist," his legacy was the subject of a bitter dispute in the USSR. There, students of A. N. Leont'ev and S. L. Rubinshtein were disputing the origin of, and correct approach to, what they called "activity theory." Although translations of this work also became available to English-speaking and European readers (see Payne, 1968; Wertsch, 1981; and many issues of the journal *Soviet Psychology*), activity theory did not become a general fashion in North America, as Vygotskian ideas did at the time. However, it did attract a significant following in Northern Europe, especially in the version promoted by Leont'ev and his students, eventually becoming an intellectual presence in North America and Japan, where it has captured the interest of psychologists involved in the domains of work and education.

For the past several years I have been striving, with rather limited success, to understand the intellectual issues that divide the Vygotskian and activity theory approaches, as well as the division between activity theorists who follow Leont'ev and those who follow Rubinshtein. This task is complicated because, insofar as I can understand, contemporary followers of Leont'ev continue to adhere to the major principles articulated by Vygotsky, Luria, and Leont'ev in the 1920s and early 1930s,

arguing in effect that Vygotsky was an activity theorist, although he focused less on issues of the object-oriented nature of activity than on processes of mediation in his own work (Engeström, 1987; Hydén, 1984). Followers of Rubinshtein, on the other hand, deny that Vygotsky was an activity theorist and tax him with "signocentricism," which in the overheated debates of the last decade of Soviet power seemed to be roughly equivalent to "idealist," a sin at that time (Brushlinsky, 1968). At the same time, they criticized Leont'ev for placing too much emphasis on activity as external conditions, likening him to a behaviorist (Abulkhanova-Slavskaya, 1980).

I do not want to minimize the possible scientific benefits to be derived from attempting to understand these disagreements more thoroughly, although I am not certain how productive such attempts will be for non-Russian psychologists. From existing historiographical evidence, debates among Russian adherents of these various positions appear to have been tightly bound up with the wrenching political upheavals that racked the Soviet Union repeatedly between 1917 and 1991 (and which are by no means over) (Van der Veer & Valsiner, 1991). What I am almost positive of, however, is that it would not be productive for adherents of the various positions to carry those battles into the international sphere except insofar as they have international intellectual merit.

What most concerns me is that for whatever combination of reasons, there has not yet been close cooperation on an international scale among psychologists who work under the banner of activity theory and those who use some version of the concept of sociocultural psychology as their conceptual icon. At the first Activity Theory Congress in Berlin in 1986, there was only one major address that took the work of Vygotsky and Luria to be coequally relevant to the proceedings with that of Leont'ev, and individual talks that proceeded from a more or less Vygotskian perspective were relatively rare. At the second Activity Theory Congress in 1990, there was a far richer mix of viewpoints, but many of the people prominent in organizing the current meeting in Madrid were preoccupied with preparatory work for the current meeting and did not contribute.

It would be most unfortunate if adherents of the various streams of psychological thinking whose history I have sketched were to continue their work in isolation from each other. The common intellectual issues

facing different streams of cultural-historical, sociocultural, activity-based conceptions of human nature are too difficult to yield to piece-meal efforts. It is time for those who have come to questions about the socio-cultural-historical constitution of human nature to join in a cooperative search for their common past and to initiate coopera-tive efforts to address the difficult intellectual issues and staggering national and international problems facing humanity in the post–Cold War era.

The common starting point

I take the common starting point[2] of all socio-cultural-historical viewpoints about which I have been speaking to be the as-sumption that the species-specific characteristic of human beings is their need and ability to inhabit an environment transformed by the activity of prior members of their species. Such transformations and the mechanism of the transfer of these transformations from one gen-eration to the next are the result of the ability/proclivity of human beings to create and use artifacts – aspects of the material world that are taken up into human action as modes of coordinating with the physical and social environment. The idea that the mediation of activ-ity through artifacts (often referred to by the slightly reduced concept of tools) is the fundamental characteristic of human psychological processes and the human environment can be found in the scholarly traditions of many countries as the following examples are intended to illustrate:

If we could rid ourselves of all pride, if, to define our species, we kept strictly to what the historic and prehistoric periods show us to be the constant characteristic of man and of intelligence, we should say not *Homo Sapiens* but *Homo Faber*. In short, *intel-ligence, considered in what seems to be its original feature, is the faculty of manufacturing artificial objects, especially tools for making tools, and of indefinitely varying the manufac-ture.* Henri Bergson (1911/1983, p. 139)

Experience does not go on simply inside a person. . . . In a word, we live from birth to death in a world of persons and things which is in large measure what it is because of what has been done and transmitted from previous human activities. When this fact is ignored, experience is treated as if it were something which goes on exclusively inside an individual's body and mind. It ought not to be necessary to say that expe-rience does not occur in a vacuum. There are sources outside an individual which give rise to experience. John Dewey (1938/1963, p. 39)

Man differs from animals in that he can make and use tools. [These tools] not only radically change his conditions of existence, they even react on him in that they effect a change in him and his psychic condition.

[Now] instead of applying directly its natural function to the solution of a particular task, the child *puts between that function and the task a certain auxiliary means . . . by the medium of which the child manages to perform the task.* Alexander Luria (1928, pp. 493, 495)

While the animal learns something in its individual life, this always remains his own property but the creations and achievements of man have a lasting existence and trans-mit themselves from one generation to the next. This fact is the reason for man's immense development, the fact that each generation did not always have to begin anew, but could continue its work where its predecessor left off. . . . Society consists not only of those living now, it also reaches into the past and the future. Eric Stern (1920/1990, p. 18)

Implicitly or explicitly, these early formulations emphasize the double-sided nature of artifact-mediated actions. On the one hand, there is the tool/auxiliary means, but such means are themselves de-fined with respect to the goals of behavior – the task. The inextricable link between these two moments of human activity are neatly sum-marized by Vygotsky as follows:

All processes forming part of that method form a complicated functional and structural unity. This unity is effected, first, by the task which must be solved by the given method, and secondly, by the means by which the method can be followed. . . . It is precisely the structure which combines all separate processes, which are component parts of the cultural habit of behavior, which transforms this habit into a psychological function, and which fulfills its task with respect to behavior as a whole. (1929, pp. 420–421)

The remaining central postulates of this paradigm flow necessarily from the premise of artifact mediation. Historical (genetic) analysis is an essential methodological tenet of this paradigm because culture (the synthesized totality of artifacts available to a group) and mediated be-havior emerged as a single process of hominization. To understand the workings of culturally mediated behavior, it is necessary to understand processes of change and transformation that, by definition, take place over time. A *full* theory demands simultaneous analysis on several tem-poral levels (what Wertsch, 1985, refers to as genetic domains) because any psychological phenomenon emerges from interaction of processes

occurring at all the levels of the human life system: phylogeny, cultural history, ontogeny, and microgenesis.

The emphasis on social origins of human psychological functions arises from the same source. As Dewey emphasizes in the fragment quoted earlier, every child is born into a world transformed by the activity of prior generations. It is only enculturated human beings who can organize children's environments and thus afford them the opportunity to appropriate the existing pool of cultural resources. It is only through interactions with other human beings that newcomers can become old-timers.

The overall perspective sketched here is summarized quite succinctly by Vladimir Lektorsky, who wrote the following using activity theory as his point of departure:

> Practical activity itself must be understood in its specifically human characteristics, namely as joint or collective activity in which each individual enters into certain relations with other persons; as mediated activity in which man places between himself and an external, naturally emerging object other man-made objects functioning as instruments of activity; and finally, as historically developing activity carrying in itself its own history. (1980, pp. 136–137)[3]

The result of accepting these propositions is to commit oneself to charting difficult and poorly understood territory. It means, to use Valsiner's term, that human psychological processes are *coconstructed*. It renders problematic standard psychological research methods without specifying their replacements.

It is difficult to overemphasize the fact that the problems we are facing are old problems. They were not generally or satisfactorily solved by those who promoted socio-cultural-historical activity approaches at the turn of the century, and they continue to confront us today. This point is brought home in a thoughtful review of two volumes of research in this tradition edited by Jaan Valsiner. The reviewers, Sharon Lamb and Robert Wozniak (1990), point out that the views promoted by authors in the Valsiner volume are similar to those promoted at the turn of the century by James Mark Baldwin, who turned away from psychology to philosophy, in part because he despaired of reconciling the complex object of analysis with the inadequate tools of analysis at his disposal. They go on to comment that, like Baldwin, Valsiner and his colleagues find themselves severely hampered by the limitations of traditional method.

Lamb and Wozniak offer several criteria for good research that adopts a coconstructionist theoretical approach:

1. dynamic analysis of the flow of events over time
2. interactional analysis of dyads, triads, and larger units
3. pattern analysis of the interrelatedness of variables
4. transactional analysis of person–environment interactions
5. multicultural and historical analyses
6. willingness to deal with the messy interactions outside of laboratories

This list strikes me as an excellent starting point for formulating a broad agenda for research by those concerned with the issues of this volume. The remainder of my chapter will be devoted to one modest effort in this direction. One theme of my remarks will be that the task confronting us is even more complex than Lamb and Wozniak's list recognizes because there is a third partner in the coconstruction process – the cultural past reified in the cultural present in the forms of the artifacts that mediate the process of coconstruction.

A "mesogenetic" method for the study of culture and thought

The idea that to understand behavior means to understand the history/genesis of behavior has long been acknowledged as a fundamental tenet of cultural-historical approaches to the study of human nature. The actual representation of this idea in the practice of cultural-historical psychologists has, however, been restricted to implementing only parts of the overall paradigm. In place of research programs that include phylogenetic, cultural-historical, ontogenetic, and microgenetic data within a single, integrated field of inquiry, scholars have focused entirely on a single genetic domain (ontogeny or microgenesis, for the most part) or the relationship between two neighboring domains (e.g., ontogenetic changes in microgenetic processes).

The reason for this state of affairs is obvious: phylogenetic and cultural-historical change generally take place at rates so slow with respect to the ontogeny of the investigator that integrated research is impossible. In the relatively few cases where the goal has been to study the relation between phylogeny or cultural development and ontogeny, the "cross-species" and cross-cultural methods, with all of their attendant methodological problems, have been used.

In the research to be described here, my colleagues and I have adopted what might be called a "mesogenetic" approach to cultural mediation, one whose time scale falls between the microgenetic scale employed in classical studies, where children are confronted with a difficult problem and their use of new mediational means is studied, and the macrogenetic scale implied by the historical difference between peasant and industrialized societies. The basic strategy for this research has been to create a system of activities with its own standing rules, artifacts, social roles, and ecological setting, that is, its own culture.[4] Since it was formed almost a decade ago, this cultural system has sustained and replicated itself through many "generations," and it now exists in a variety of institutional environments in several geographic locales. This cultural system goes through a yearly cycle of growth and decline that divides naturally into four "seasons," each with its own typical properties of growth and interactivity. Because of its cyclic nature and the fact that new members enter the culture at specified periods throughout the year, it gives us an unusual opportunity to investigate the dynamic relationship between cultural change, ontogenetic change, and microgenetic change, all within a single setting.

From individual artifacts to culture

In the classical statements of cultural-historical psychology given earlier, culture is represented only in a restricted, abstracted form designed to highlight the crucial property of mediation through artifacts. Artifacts do not, of course, exist in isolation. Rather, they are interwoven with each other and the social lives of the human beings they mediate in a seemingly infinite variety of ways. Considered in the aggregate, they constitute the unique medium of human life, the medium we know as culture.

In attempting to bridge the prototypical examples of artifact mediation embodied in experimental setting where a child confronts a difficult task that can be solved by the appropriation of a readily available tool or mediation through an adult to contemporary notions of cultural systems, I have found it helpful to adopt Marx Wartofsky's (1979) three-level hierarchy of artifacts. The first level consists of *primary artifacts*, those directly used in production (as examples, Wartofsky gives "axes, clubs, needles, bowls"; my examples will include comput-

ers, telecommunications networks, and mythical cultural personages). This level corresponds closely to the concept of tool as it is ordinarily used.

The second level, *secondary artifacts*, consists of representations both of primary artifacts and of modes of action using primary artifacts. An important kind of secondary artifact are *cultural models,* which "portray not only the world of physical objects, but also more abstract worlds such as social interaction, discourse, and even word meaning" (D'Andrade, 1984, p. 93).[5] Secondary artifacts play a central role in preserving and transmitting modes of action.

The third level is a class of artifacts that "can come to constitute a relatively autonomous 'world,' in which the rules, conventions and outcomes no longer appear directly practical, or which, indeed, seem to constitute an arena of non-practical, or 'free' play or game activity" (Wartofsky, 1979, p. 208).

Wartofsky calls these imagined worlds *tertiary artifacts*. Such imaginative artifacts, he suggests, can come to color the way we see the "actual" world, providing a tool for changing current praxis. In modern psychological jargon, modes of behavior acquired when interacting with tertiary artifacts can transfer beyond the immediate contexts of their use. Wartofsky applies this hierarchical conception of artifacts to works of art and process of perception; I want to generalize his conception for use in designing activities for children that will promote their social and cognitive development. To make that link I must now turn to a second key concept, that of culture as a medium.

The garden as a metaphor for culture-as-medium

The notion of culture as a special medium of human life is certainly familiar to cultural-historical theorists, but here I want to draw on its interpretation within the history of Anglo-Saxon thought, whose metaphors appear especially useful in dealing with critical methodological problems facing the field.

Raymond Williams, who has traced the English concept of culture back to its connection with Latin roots, notes that the core features that coalesce to produce modern conceptions of culture refer to the process of helping things grow. "Culture," Williams wrote, "in all of

its early uses was a noun of process: the tending of, something, basically crops or animals" (1973, p. 87).

Sometime around the sixteenth century, the term "culture" began to refer to the tending of human children, in addition to crops and animals. From the beginning, the core idea of culture as a process of helping things grow was combined with a general theory for how to promote growth: Create an artificial environment where young organisms could be provided the optimal conditions for growth. Such tending requires tools, of course, and it is somehow provocative to learn that one of the early meanings of culture was "plowshare."

Although it would be foolish to overinterpret the metaphoric parallels between the theory and practice of growing the next generations of crops and growing the next generations of children, the exercise, I will argue, has particular heuristic value for thinking about the processes of development and for designing new activity systems to promote development. Broadly speaking, like gardeners, theorists must attend simultaneously to two classes of concerns: what transpires inside the system ("garden") they study (or design and study) and what transpires around it. These issues can often be addressed independently of each other. But, as I will attempt to show, both the putative object of analysis and its context must be considered simultaneously. To continue the metaphor, inside the garden, for every kind of plant, there is the quality of the soil to consider, the best way to till the soil, the right kinds of nutrients to use, the right amount of moisture, and the best time to plant and nurture the seeds, as well as the need to protect the growing plants against predators, disease, and so on. Each of these tasks has its own primary and secondary artifacts to draw upon. The theory and practice of development at this level will be focused on finding exactly the right combination of factors to promote life within the garden walls.

Gardens do not, obviously, exist independently of the larger ecological system within which they are embedded. While it is possible to raise any plant anywhere in the world, given the opportunity first to arrange the appropriate set of conditions, it is not always possible to create the right conditions, even for a short while. And if what one is interested in is more than a short-run demonstration of the possibility of creating a development-promoting system, but instead the creation

of conditions that sustain the needed properties of the artificial environment without much additional labor, then it is as important to attend to the system in which the garden is embedded as the properties of the garden "itself." In the extended example given in the next section, I will treat the garden-as-culture metaphor as a way of specifying a particular kind of cultural system, constituted jointly by artifact-mediated practices that occur within its walls and by the nature of its ecological setting. A schematic rendition of this idea is contained in Figure 8.1. Note that there is a close conceptual affinity between this diagram and various versions of Bronfenbrenner's (1979) ecological approach to psychology.

Applying the garden metaphor: from tertiary artifact to the Fifth Dimension

We have applied the notion of artifact and culture-as-garden to a particular cultural system we have been using to develop a cultural-historical theory of mind. We call this system of activities the *Fifth Dimension*. In terms of the garden metaphor, the Fifth Dimension is a specially designed cultural medium for promoting the all-around intellectual and social development of 6- to 12-year-old children. In Wartofsky's terms, the system is a tertiary artifact – a bounded alternative world with its own social norms, tasks, and conventions. This artifact is a tool designed to address certain long-standing problems in American education, in particular, the distressingly low academic achievement of a great many American children, the widely perceived need for them to gain a qualitatively richer experience with new information technologies, and the failure of apparently successful educational innovations to survive beyond the period of innovation and external funding.

To transform this tertiary artifact into a material system of activity, we needed, of course, to provide participants with primary and secondary artifacts as crucial mediational means. We also needed to identify likely social institutions that would serve as environments for our proposed innovation. For this purpose we have worked with youth clubs, day-care centers, libraries, churches, and schools.

Figure 8.1. The "culture as garden" metaphor applied to an artificially created system of activity, the Fifth Dimension. The innermost circle corresponds to the level of face-to-face interaction between adults and children engaged in computer-mediated activities. The next circle represents the activity as a whole. Successive circles represent higher levels of context. Note that each level of context is evaluated according to criteria specific to it.

An overview of the Fifth Dimension

Figure 8.2 provides a schematic overview of the Fifth Dimension. The central coordinating artifacts at the heart of the Fifth Dimension are shown at the top of Figure 8.2 in the form of a cardboard maze approximately 1 square meter in area divided into twenty or so "rooms," each of which gives access to two activities. About 75% of the time these activities are instantiated as computer programs that include computer games and educational software, some of which also have gamelike qualities; the remainder are noncomputer activities that include board games, arts and crafts, and physical exercise. According to the rules of the system (enshrined in a constitution, a printed copy of which each child receives upon entering the system), children can make progress through the maze by completing tasks set out by the Wizard. "Graduation" from the Fifth Dimension occurs when children have achieved the excellence level prescribed for the activities in all the rooms of the maze.

In addition to the local goal of completing a task, the rules of the Fifth Dimension provide for a variety of other goals designed to appeal to a variety of children. For example, every child is given a very plain looking token figurine upon beginning the program. By traversing a path that takes them in one door and out another, they may "transform their cruddy creature" and obtain more desirable figurines. Or they may choose to complete all the rooms in the maze, thereby attaining expert status and access to new activities. In Leont'ev's (1981a) terms, the Fifth Dimension provides a variety of possible effective motives, in addition to motives (such as the need to master new information technologies) that are merely understandable to the children.

Two other features of the life-world of the Fifth Dimension require mention. First, it is maintained that once upon a time a Wizard appeared when the adults working with children could not cope with all of the problems of running and maintaining computers, software, and the computer network that unites children in different after-school programs around the world where telecommunication is available. The Wizard is said to be the author of the constitution, provider of the software, arbiter of disputes. The Wizard is known to enjoy corresponding with children and to have a terrible sense of humor. Because
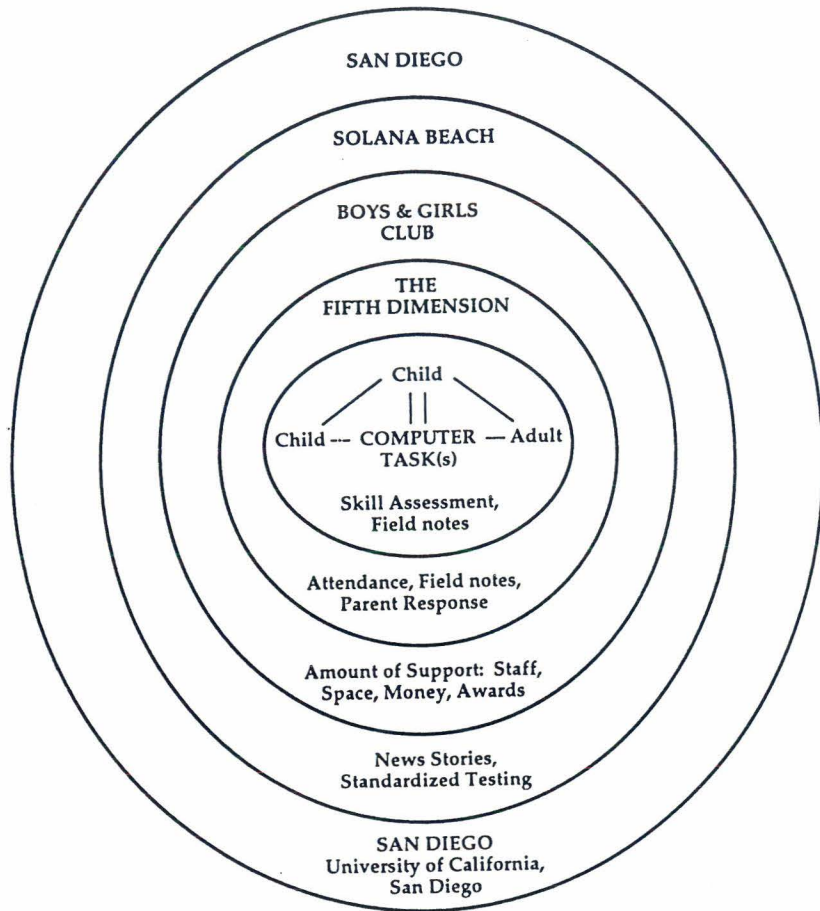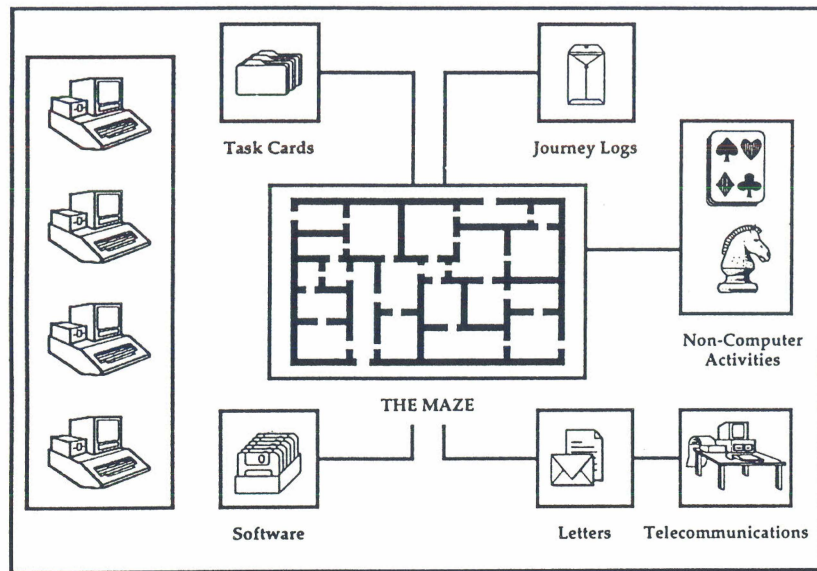
Figure 8.2. A schematic representation of the artifacts that constitute the activity system called the Fifth Dimension.

the Wizard is very forgetful, necessary tasks (such as keeping up with needed repairs of computers) are neglected and things go wrong. In such circumstances, the participants in program activities (with full justification) criticize the Wizard and send her or him (the Wizard changes sexes to fit its mood) sharply worded letters of complaint.

The Wizard is also a secondary artifact for reordering power relations between adults and children in the Fifth Dimension. This rearrangement comes about in part because when conflicts arise in the system, it is the Wizard, not the human participants, who has the power to adjudicate disputes. In such cases, adults as well as children write to the Wizard to decide how matters should proceed. It is also important that by subordinating themselves to the Wizard, the adults can collude with the children in the pretension of the Wizard's existence and thereby enter into playful relations with them. Finally, since computer technology is not especially reliable and programs or computers often fail to work, adults can off-load responsibility for breakdowns

onto the Wizard at strategic moments, a possibility that has endeared the Wizard to all adults who have worked in the system.[6]

Second, it is an important feature of the Fifth Dimension that it is staffed primarily by undergraduate students who participate in the activity as part of a course in such departments as psychology, education, and communication. These undergraduates have generally not worked with computers before and often know less about the specific game activities than do the children. Their enculturation, which intertwines with the enculturation of the children, is an important feature of the culture of the program. Their assignment is to work with the children in the activities in the role of "Wizard's assistants."[7] After every session, they write detailed field notes about their interactions with the children, the Wizard, the software, and the life of the system. These field notes are primary data about the workings of this cultural system.

Fifth Dimensions spring to life in the fall of every year when children and college students return to school. At UCSD, which divides its academic year into three 10-week quarters, the Fifth Dimension goes through three 8-week sessions that children attend from 1–4 days a week, depending on local circumstances. Undergraduates are allowed to take the course three times, and children are allowed to attend year after year. Consequently, at any given time, participants include a mix of "old timers" and "newcomers" with varying amounts of experience and knowledge about the activities. Among the interesting features of this arrangement is that cultural knowledge and age are not tightly linked: Very often the children have more knowledge about the computers, games, and norms of the program than the undergraduates, a situation that helps reorder everyday power relations with important consequences for the dynamics of the interactions that take place.

To summarize, the Fifth Dimension can be viewed both as a tertiary artifact and as a cultural system. As a tertiary artifact it is a system of activities infused with primary and secondary artifacts, participation in which is designed not only to be satisfying in itself, but to provide the participants with experiences that can influence their lives in the community and at school. As a cultural system it is an activity infused with norms, goals, meanings, and esoteric knowledge that provides the medium for learning and development.

Sample findings

The following sample of empirical findings substantiates our claim that we are dealing with a cultural system and illustrates the way in which principles of cultural-historical psychology can be investigated within it.

The process of enculturation.   One way in which it is possible to discover the existence of a culture is at its borders, one of which is marked by the difference between (enculturated) old timers and (unenculturated) newcomers. Our best evidence about the process of enculturation (and hence, the existence of a distinctive culture associated with the Fifth Dimension) comes through the field notes written by undergraduates. Routinely the undergraduates initially express their conviction that they are entering a system of shared understandings that is mysterious to them, a condition that generally evokes anxiety and an expressed desire to figure out what it takes to become a member:

As I looked into that room through the windows I had many questions running through my head. How does this program work? What am I supposed to do here? How can I possibly be a leader here when I don't know the first thing about computer games? (JG, field notes, January 20, 1992)

I was anxious about today because it would be the first day with the children. I understood the orientation but had the feeling that the only way to fully understand it was to actually play the games and spend time with the children. I expected to make a lot of mistakes, mostly in not directing the children well since I really had no direction! (AO, field notes, October 4, 1991)

It was really odd having a young adolescent guiding us through the game. I sort of felt helpless in a way, considering that knowledge is power in this society. Here we were, elders who would soon take on the challenge of helping children develop their minds and to help them get through the fifth dimension and we couldn't even finish the first round! Boy was I humiliated in a fun way! (CM, field notes, October 4, 1991)

A second, slightly more subtle indicator of the process of enculturation can be found in a predictable shift in how artifacts of the system are used by newcomers interacting in the system. Participants typically reference fundamental artifacts like the Wizard, maze, constitution, and task cards in their field notes of daily interaction as they learn to become functioning citizens. Analysis of the field notes reveals the presence of

the two "coordinates" of mediation emphasized in cultural-historical theory. These two coordinates are discussed by Leont'ev (1981b):

Vygotsky identified two main, interconnected features (of activity) that are necessarily fundamental for psychology; its tool-like [instrumental] structure, and its inclusion in a system of interrelations with other people. It is these features that define the nature of human psychological processes. The tool mediates activity and thus connects humans not only with the world of objects but also with other people. . . . But it is impossible to transmit the means and methods needed to carry out a process in any way other than in external form – in the form of an action or external speech. (p. 56)

What makes this distinction particularly interesting in the present circumstances is that there is a shift in the relative use of interrelational and instrumental mediational patterns that reflects participants' enculturation into the cultural system. When they first enter the system, Fifth Dimension participants hear about artifacts like the constitution, Wizard, task cards, and maze from other people. But they are confused about their functions and how they fit into the overall pattern of activity. Then, as they acquire knowledge about the workings of the system, they appropriate them in unique ways to accomplish their goals.

This enculturation process is reflected in the way artifacts are discussed in the field notes. At first, field note references to the artifacts are primarily oriented toward interpreting and understanding "their inclusion in a system of interrelations with other people." As participants become more comfortable in the culture, they begin to view these objects more like tools, and the instrumental function appears in their field notes.

Typical examples of interrelational uses of the lexicon referring to cultural artifacts in the system come when a participant mentions some element of its cultural artifacts as a means of gaining understanding:

Scott proceeded to tell us more about the program: what our role with the children would be, how to use the maze as a guide, the taskcards. . . . We then split into small groups in order to use the computers and different games. (LA, field notes, October 1, 1991)

Here, we learned about the task cards, the hint box, the journey log, the all knowing Wizard and his Wizard's assistants, the 5th Dimension map, the constitution. . . . Even the Task Cards didn't give you that much advice. (JG, field notes, January 14, 1991)

Later, participants used the task cards in an instrumental fashion. A variety of such instrumental uses can be distinguished:

Since he didn't read the instructions, I read him the task card and then asked him to tell me the objective of the game and what he needed to do in order to finish the game successfully. (LA, field notes, October 31, 1991)

The Task Card mentions that you should start off with all levels at five and gradually increase one of the variables to see which level they belong to, to eventually reach the requested growth of 100cm (Botanical Gardens) (CM, field notes, December 5, 1991)

I asked if Isabel would read the task card out loud so that we would know what to do in the game. Isabel had some difficulty in pronouncing some of the bigger words that appeared on the task card, but I helped her with these words. One of the words that she had difficulty pronouncing was Island, but she knew how to pronounce it upon finishing reading the task card because it was used a lot and hence, she was forced to repeatedly pronounce it. (EB, field notes, October 24, 1991)

An analysis of the frequency and usage of references to various key artifacts shows changes in vocabulary usage over time. References to task cards illustrate this trend. As shown in Figure 8.3, in the first weeks of their participation in the Fifth Dimension, students' references to task cards are primarily of an interrelational kind, but toward the end of the 8-week session, instrumental uses came to outnumber interrelational uses. Current analyses suggest an additional result. When students continue in the program for two or more "seasons," the third kind of incorporation of such artifacts into their conceptual systems emerges – a reflective/critical function in which they comment on the way that novices understand (or fail to understand) their uses and ways in which the artifacts could be improved through modification:

The day began with a visit from Romy; she wanted me to tell her whether the task card for Golden Mountain was a good one or a bad one. [Later she wrote:] I think that if I had read him the task card straight through I would have lost him. . . . The task card was not challenging for the children. (CM, field notes, November 5, 1991)

The relationship between culture and its ecological setting.   It is a truism of anthropological research that cultures represent qualitatively distinct, historically specific adaptive systems that form over generations of interaction between social groups and their environments. It is equally true, but less generally recognized, that context means more (or other) than "that which surrounds"; "text" and "con-text" are mutually constitutive of each other, and when used in this way, context is a *relational* concept (Bateson, 1972). Our experience with the Fifth Dimension has made this relational aspect of context too salient to overlook.
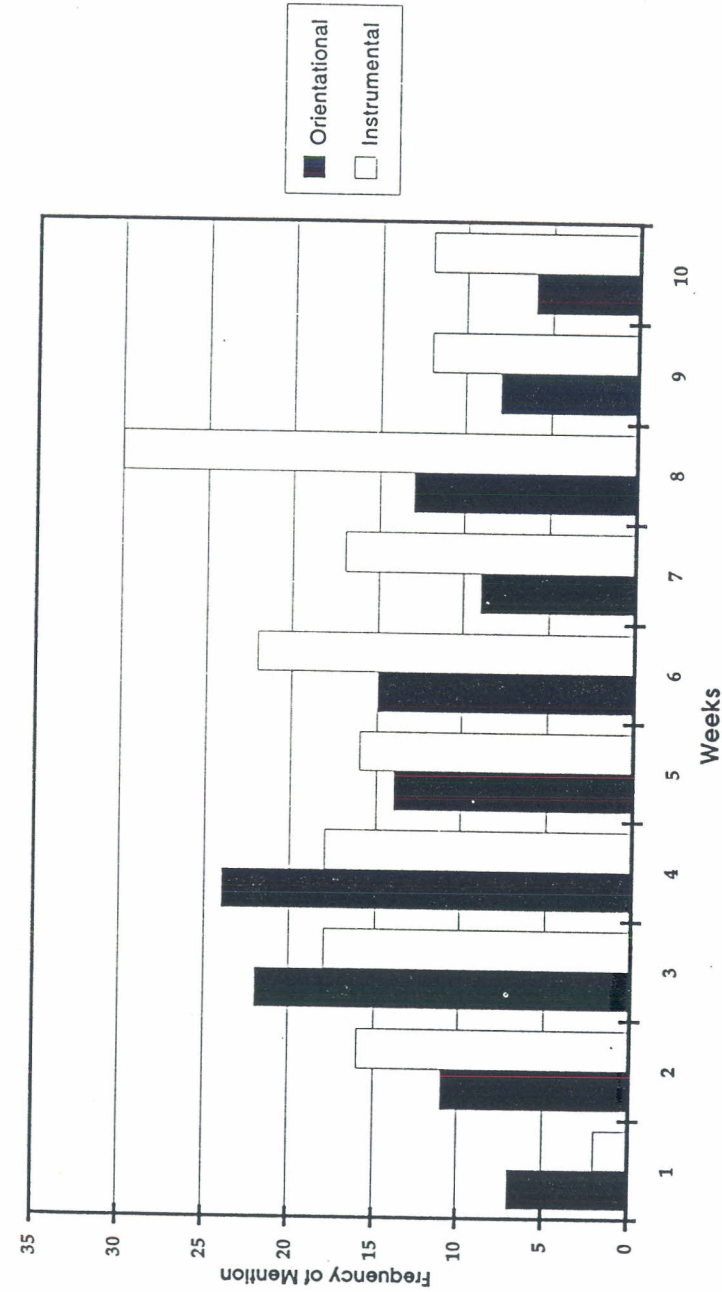

Figure 8.3. The frequency of orientational and instrumental uses of the term "task card" over the course of a 10-week season in which the Fifth Dimension operated.

In a recent paper, Ageliki Nicolopolou and I compared the cultural systems characterizing two Fifth Dimension programs located in the same town, one in a Boys and Girls Club, the other in a library (Nicolopolou & Cole, 1993). These two cultural systems each used the same set of program artifacts, ran at the same hour of the day, involved undergraduates from the same course, and served children from the same socioeconomic background. Given this commonality of mediational means and institutional purposes, it might be thought that similar, if not identical, cultures would emerge in the two settings. Yet the two systems were remarkably different from each other. Whenever people who participated in one of the systems for a while journeyed to the other, they invariably remarked on the difference. The Fifth Dimension at the Boys and Girls Club seemed loud and chaotic as children came and went for reasons that were difficult to fathom. The children worked with undergraduates and played games, but there seemed to be a more contentious atmosphere and a good deal of byplay. By comparison, the library group seem intimate and concentrated; children came on time and stayed to the end of the session, often having to be dragged away by their parents or pushed out the door by the librarians. Intense friendships grew between undergraduates and children, and concentration on the games was often intense.

A key to accessing the difference between the two cultural systems is to step outside of the system (beyond the walls of the Fifth Dimension–as–garden) to examine its local ecology. Outside the room that houses the Fifth Dimension program it is clear that the Boys and Girls Club is a boisterous place with rock music blaring and pool games usually in progress nearby. Elsewhere children are playing basketball and tag, or gossiping with their friends. The library, expectedly, is a quiet place where decorous behavior is expected at all times; education, not play, is the leading activity of the library. When children left the Fifth Dimension program in the Girls and Boys Club, as they were free to do at any time, there were many different activities to engage in; they could even go home if they liked. But when the children left the program at the library, they were expected to read quietly and wait for their parents, who expected them to spend the full 1½-hour session there.

When we investigated the relationship between the two programs and their institutional settings, we immediately grasped how the culture

of each activity (text) is coconstituted with its context (Figure 8.4). Using the crude variable of "noise level" as a proxy for the qualitatively complex differences between the two locations, we found that while the program in the Boys and Girls Club was noisier than the one in the library, the program in the library was noisier than its institutional ecology while the one in the Boys and Girls Club was quieter than its setting.

The qualitative features of each Fifth Dimension are created in the relationship of text to context. Each of the programs mixes two main kinds of activity – education and play. In an institutional context where play dominates, the educational features of the Fifth Dimension render it relatively more serious and education-like, while the play features make it noisier and more playlike than a serious educational setting such as a library. Each is a compromise, a synthesis of the properties of the objects and their contexts.

The relation between cultural "level" and cognitive achievement.   A long-standing issue in the study of a culture's impact on the development of thought is the relationship between the level of knowledge characteristic of that culture and the cognitive achievements of its members. As a way of testing the cognitive correlates of these apparent cultural differences, Nicolopolou compared the degree to which each of the two cultural systems fostered the development of shared knowledge using the evidence provided by field notes gathered when children were playing a particular computer game. Figure 8.5 shows the changes in performance on one of the Fifth Dimension games over the course of the year in the two settings. Note that in the Boys and Girls Club there is no overall increase in the level at which the game is played; performance at the beginning of the year is actually better, on average, than at the end of the year. By contrast, performance improves with the growth of the culture of shared knowledge achieved in the library. A number of measures of the density and growth of the cultures of the two programs confirmed that there was little growth during the year at the Boys and Girls Club, but marked and sustained growth in the library.

Effectiveness of the tertiary artifact.   A good deal of our current research is devoted to developing ways of evaluating the impact of participation
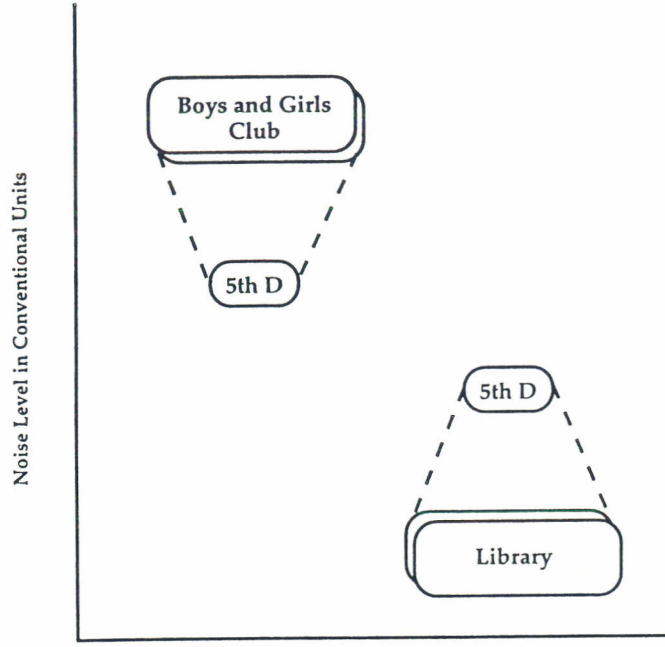
Figure 8.4. A schematic representation of the relationship of Fifth Dimension programs to their institutional contexts in the library and the Boys and Girls Club. Note that the program is quieter than its context at the Boys and Girls Club, but noisier than its context in the library, indicating the way in which properties of an object and its context are mutually constituted.

in the Fifth Dimension on individual children. There is not space to go into the complex issues of evaluation, but in closing I want to mention an unusual line of investigation that this line of work makes possible. Because the Fifth Dimension has been in existence for several years in a locale with a more or less stable population, we have had the opportunity to observe children for extended periods of time. However, owing to the institutional timetable of the university, the undergraduates who have interacted with the children and provided the field notes are constantly changing. Consequently, as the children grow older and the culture of the Fifth Dimension continues to evolve and deepen its roots in the institution, the age and experience of the observers does *not* change. This unusual circumstance permits a new kind of longitudinal study of individual children.
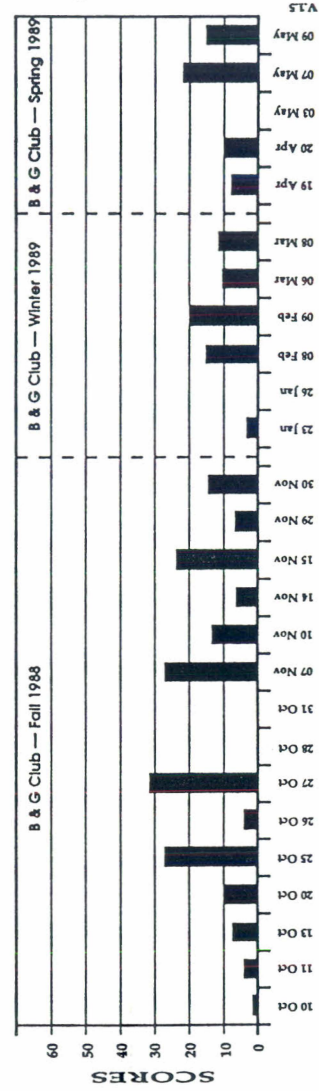

MYSTERY HOUSE GAME SCORES
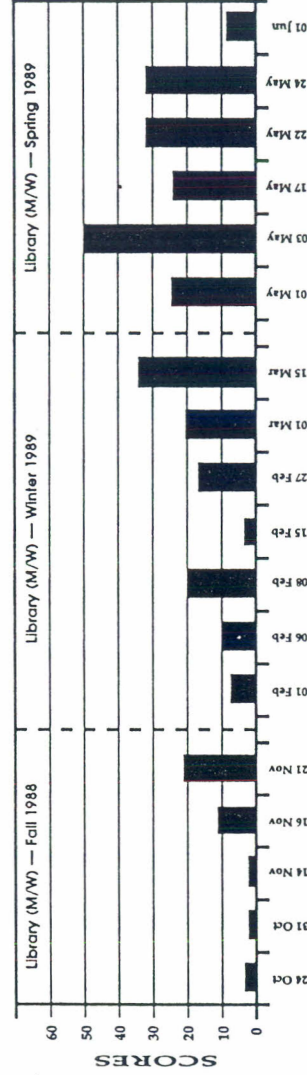
Figure 8.5. Performance levels for children playing the game "Mystery House" in the library and the Boys and Girls Club. Performance builds over the course of the year in the library but does not in the Boys and Girls Club, consistent with the fact that the amount of shared cultural knowledge increased over the year only in the library.

A single example of a child I will call Chet illustrates the potential of this method. Chet was classified by the personnel of the Boys and Girls Club as a "special needs" child. In this case, the special need arose from a difficult home situation and the suspicion that Chet was mildly retarded. The director of the program for special needs remarked that, in his opinion, during the past year Chet had made excellent progress in the cognitive and social spheres. Chet seemed more confident of himself and less self-conscious, a change that the director attributed to his accomplishments in the Fifth Dimension. As an exercise, we went back over the field notes of interactions involving Chet between 1987, when he first entered the program, and 1992. There we noted a remarkable change. From a child who had difficulty paying attention and dealing with the tasks of the program, Chet had become adept at many of the games, helpful to teach undergraduates not only how to be members of the Fifth Dimension, but how to use the computers that were baffling them. Instead of remarking on his lack of abilities, the undergraduates working with Chet reported him to be an intelligent and socially accomplished young man.[8]

It is, of course, extremely difficult to separate other influences in Chet's life from those of the Fifth Dimension. However, I am impressed with two facts. First, Chet has clearly made advances in his ability to engage in joint activity with undergraduates around computers and games, advances that were not predictable from his behavior several years earlier. Second, both Chet and the adults around him attribute his current satisfaction and accomplishments to the experiences of the Fifth Dimension. At least in the perception of these participants, the program is fulfilling the task of a tertiary artifact as defined by Wartofsky – providing its users with tools for dealing more effectively with their everyday lives because of the time they spend living imaginatively in it.

The sustainability of change.   One of the central issues highlighted by the garden metaphor is the importance of creating *sustainable* environments. By its very nature, research on sustainability requires that the research be continued long enough to determine if the newly created activity system will continue to exist in a steady state. It is of course important to demonstrate that it is possible to create a useful environment for nurturing children's intellectual and social abilities; this was

the focus of our research at the outset of this project, and it remains an ongoing concern (Cole, Quan, & Woodbridge, 1992). However, our experience has taught us that proving the effectiveness of an innovation such as the Fifth Dimension is difficult. This lesson was brought home to us most poignantly in a comparison of the fates of the programs at the Boys and Girls Club and the library.[9]

At the very start of the project, we made it clear that at the end of a 3-year period, the project would come to an end. We promised that at that time we would be prepared to continue staffing the program with eager undergraduates who would be given course credit at the university. The university would also continue to provide telecommunications facilities so that the children could communicate with children in other parts of the country and the world. But we would no longer provide the computers, software, and the labor of a site coordinator: This would be the responsibility of the local institution.

During the project we worked with the staffs of the local institutions to develop expertise in running the programs and we helped them raise money locally to begin the process of replacing hardware and software. We created special activities within the program that required the children to acquire library skills, and we met with staff periodically to review progress in the program, which they seemed to support. However, when the time came for a shift to shared responsibility, the library staff decided that they did not want to continue the program. There were many reasons for this decision: The library was short of space, there were administrative difficulties in handling the money needed to pay a site coordinator, they did not have time to train people to work with the children, and so on. Each of these problems could have been solved, but the fact of the matter was that even if the money was available and volunteers stepped in to help, the librarians had come to the conclusion that the Fifth Dimension did not fit closely enough with their main goals. And that was the end of that.

By contrast, the Boys and Girls Club not only accepted their new role; they supported the diffusion of the Fifth Dimension into two neighboring clubs. They gave the program an award and embraced it as an important new addition to their program.

This situation will be recognized as paradoxical from the perspective of a developmental psychologist. There is no doubt in my mind that the library club was a better "garden" for cultivating cognitive and

social development, but it was not sustainable and no traces of it remain. On the other hand, the very properties that weakened the developmental impact of the program in the Boys and Girls Club, especially the freedom that children felt to come and go as they pleased, made it an easy-to-assimilate activity from the institution's point of view.

In this context, the relationship of activity to setting depicted in Figure 8.4 takes on added significance. The fact that the library program, while quieter and more studious than the Boys and Girls Club program, was noisier than its setting turned out to be a major factor in its eventual demise at the same time that it was a major factor in being desirable from a psychological perspective. By the same token, the relative quiet of the Boys and Girls Club program confirmed its (relatively) educational nature (relative to the other activities at the club) and made it a feather in the program's cap.

This story is still in progress, of course. At the time of writing these remarks, we have just completed an experimental summer program at the Boys and Girls Club that has been conducted in a more structured manner, with regular, scheduled attendance. The institution *liked* the more structured approach and for the coming year proposed that we introduce it into the regular activities of the club in a somewhat modified form that allows drop-in participation when children fail to turn up for their scheduled appearances in the program. We cannot be certain that this innovation will be a success, of course; only time and continued effort will tell.

Notes

1. In the chapter title I have used the awkward convention of referring to socio-cultural-historical psychology to emphasize my theme of commonality among approaches designated by the elements of that hyphenated phrase in isolation. In an earlier paper (Cole, 1988) I used the term "sociohistorical" to refer to the work of Leont'ev, Luria, Vygotsky, and their students as it was appropriated by American scholars. In part this decision was based on my belief that since cultural phenomena are necessarily historical, the social nature of cultural-historical phenomena needed to be emphasized. It might also be noted that Leont'ev (1981a) used this term in his well-known monograph on development. Subsequently, after many discussions of the issues involved, I have come to the conclusion that such a change in terminology does a disservice to the historical record and fails to add conceptual clarity,

since cultural-historical phenomena are also necessarily social. Consequently, I will use the term "cultural-historical," or "cultural-historical activity theory" throughout this chapter.

2. It should be clear that in the paragraphs to follow I am saying nothing original; rather, I am attempting to summarize what I take to be generally accepted background knowledge that can serve as a foundation for further discussion.

3. Lektorsky identifies this as a conclusion from Marxist philosophy; the same conclusion follows just as readily from American pragmatism.

4. Yrjo Engeström (1987) refers to this as "activity-genesis."

5. Dorothy Hammond and Jaan Valsiner (1988) note the close correspondence between cultural models and what they call "mediational devices." They prefer to limit the notion of mediational device to "circumscribed, tangible activities or objects of sensory dimensions." I prefer to think of cultural models as systems of artifacts so as to emphasize the dual material–ideal nature of both cultural models and artifacts with more obvious sensory dimensions.

6. The function of the Wizard is distributed among undergraduates and research staff in such a manner that the best way to state what the Wizard *really* is, is to characterize it as the collective will of the adults to promote the children's welfare.

7. The normative rule of thumb that guides their participation is that they should provide as little help to the children as possible, but as much as necessary so that the children have a good time (this heuristic will be recognized as an operationalization of the notion of a zone of proximal development; Vygotsky, 1978).

8. This analysis was carried out by Amy Olt.

9. For a fuller account of research on the sustainability issue, see Cole and Nicolopolou (1991).

References

Abulkhanova-Slavaskaya, K. A. (1980). The category of activity in Soviet psychology. *Psikhologicheski Zhurnal, 1,* 11–28.

Bakhurst, D. (1986). Thought, speech, and the genesis of meaning: On the 50th anniversary of Vygotsky's *Myshlenie i rech. Studies in Soviet Thought, 31,* 102–129.

Bateson, G. (1972). *Steps to an ecology of mind.* New York: Ballantine.

Bergson, H. (1911/1983). *Creative evolution.* New York: Henry Holt.

Bronfenbrenner, U. (1979). *Experimental human ecology.* Cambridge, MA: Harvard University Press.

Brushlinsky, A. V. (1968). *The cultural-historical theory of thinking.* Moscow: Vyshaya Shkola.

Cole, M. (1988). Cross-cultural research in the sociohistorical tradition. *Human Development, 31,* 137–151.

Cole, M., & Nicolopolou, A. (1991). *Creating sustainable new forms of educational activity in afterschool settings.* San Diego: Laboratory of Comparative Human Cognition, University of San Diego.

Cole, M., Quan, S., & Woodbridge, S. (1992). *A mixed activity setting for the promotion of cognitive and social development.* San Francisco: American Educational Research Association.

D'Andrade, R. (1984). Cultural meaning systems. In R. A. Shweder & R. A. LeVine (Eds.), *Culture theory: Essays on mind, self, and emotion* (pp. 88–122). Cambridge University Press.

Dewey, J. (1938/1963). *Experience and education.* New York: Macmillan.

Engeström, Y. E. (1987). *Learning by expanding.* Helsinki: Oy.

Hammon, D., & Valsiner, J. (1988). Cognition, symbols, and Vygotsky's developmental psychology. *Ethos, 16,* 247–272.

Hydén, L-C. (1984). Three interpretations of the activity concept: Leont'ev, Rubinshtein and critical psychology. In M. Hedegaard, P. Hakkarainen, & Y. E. Engeström (Eds.), *Learning and teaching on a scientific basis* (pp. 33–41). Arhus: Psykologisk Institut.

Lamb, S., & Wozniak, R. (1990). Developmental co-construction: Metatheory in search of method. *Contemporary Psychology, 35,* 253–254.

Lektorsky, V. A. (1980). *Subject, object, and cognition.* Moscow: Progress.

Leont'ev, A. N. (1981a). *Problems in the development of mind.* Moscow: Progress.

Leont'ev, A. N. (1981b). The problem of activity in psychology. In J. V. Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 37–71). Armonk, NY: Sharpe.

Luria, A. R. (1928). The problem of the cultural development of the child. *Journal of Genetic Psychology, 35,* 493–506.

Nicolopolou, A., & Cole, M. (1993). The Fifth Dimension, its playworld, and its institutional contexts: The generation and transmission of shared knowledge in the culture of collaborative learning. In E. A. Forman, N. Minnick, & C. A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development* (pp. 283–314). New York: Oxford University Press.

Payne, T. R. (1968). *S. L. Rubenstejn and the philosophical foundations of Soviet psychology.* New York: Humanities.

Stern, E. (1920/1990). Problems of cultural psychology. *Zeitschrift fur die gesamte Staatwissenschaft, 75,* 267–301. Translated and reprinted in the *Quarterly Newsletter of the Laboratory of Comparative Human Cognition, 12,* 12–23.

Van der Veer, R., & Valsiner, J. (1991). *Understanding Vygotsky: A quest for synthesis* Oxford: Blackwell.

Vygotsky, L. S. (1929). The problem of the cultural development of the child, Part 2. *Journal of Genetic Psychology, 36,* 415–434.

Vygotsky, L. S. (1978). *Mind in Society.* Cambridge, MA: Harvard University Press.

Wartofsky, M. (1979). *Models.* Dordrecht: Reidel.

Wertsch, J. (1981). *The concept of activity in Soviet psychology.* Armonk, NY: Sharpe.

Wertsch, J. (1985). *Vygotsky and the social formation of mind.* Cambridge, MA: Harvard University Press.

Williams, R. (1973). *Keywords.* New York: Oxford University Press.