8 Cultural–historical psychology: A meso-genetic approach

Michael Cole

> . . . we can view the past, and achieve our understanding of the past, only through the eyes of the present. – E. H. Carr 1961, p. 28.
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> . . . all experience is an arch wherethrough
> Gleams that untravelled world whose margin
> fades
> Forever and forever when I move. – Tennyson 1842

In the course of the two decades during which Sylvia Scribner and I interacted around questions of culture and cognition, the problem of how to implement the historical aspect of a cultural-historical approach to human mental functioning was a recurrent theme of our discussions. This theme was present, for example, in our joint explorations of cultural variations in thinking, where the history of people's cultural practices, as well as the current intellectual consequences of these practices, occupied our attention (Scribner & Cole 1981). It was present in a different way in the many cases when we worked with people of different ages and conducted learning experiments that permitted us to observe ontogenetic and "microgenetic" changes in the organization of behavior (Scribner & Cole 1972; Cole & Scribner 1977; Mandler, Scribner, Cole, & DeForest 1980). However, while Sylvia wrote explicitly about the concept of history in psychological research (Scribner 1985), historical questions were more often the subject of our informal discussion than the focus of our joint research.

As a means of continuing Sylvia's efforts to focus attention on the historical aspects of cultural-historical psychology, I will devote the bulk of this essay to describing a line of research that began in the mid-1980s, several years after our direct collaboration had come to an end and our interactions were restricted to aperiodic phone calls and discussions at meetings in which we traded notes about the progress (or lack thereof!) of our separate pursuits of common intellectual goals. The particulars of the research I will describe are quite different from those that characterized our joint research in the 1970s or those that occupied Sylvia in the last decade of her life. However, I believe that this work is relevant to Sylvia's general interest in the historical dimension of human activity and human thought.

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Kinds of history

An appropriate starting point for my comments is Sylvia's 1985 article, "Vygotsky's uses of history" which was first presented at a conference in 1980.[1] Her goal in that paper was to explain how Vygotsky attempted to weave general history, ontogeny, and the history of mental functions into a single framework for interpreting human nature.[2] A special virtue of Vygotsky's approach, in her opinion, was his assumption that different levels of history take place concurrently and mutually influence each other. But, she wrote, neither Vygotsky nor contemporary researchers had made sufficient progress in finding ways to study these mutual influences. As she noted,

> It is customary for investigators concerned with culture and thought to single out for emphasis one or another level of changes as seems suitable for the inquiry at hand. Psychologists, for example, tend to conceive of the individual as a dynamic system while assuming in their research designs that history on the societal level is static; anthropologists often make the reverse assumption. (S. Scribner 1985, p. 140)

One strategy for overcoming this shortcoming in studies of culture and cognition is to examine historical circumstances of rapid cultural change where, in principle, one can observe the mutual influence of cultural and ontogenetic change on each other. Sylvia mentioned in this regard the work of Geoffrey Saxe (1982) on the development of arithmetical thinking among the Oksapmin of New Guinea, where children and adults were encountering and acquiring a base-10 number system in addition to their indigenous system based on 23 body parts. He showed that the ontogenetic development of arithmetical concepts depended upon their exposure to schooling and intrusion of money-based economic exchanges into their daily activities. Saxe's more recent work on

the development of arithmetic thinking among Brazilian child street vendors under conditions of rapid inflation and Patricia Greenfield's studies of changes in the ontogeny of pattern generating ability among weavers associated with a rapid conversion to a money economy in Zinacantan provide other excellent examples of such as strategy (Saxe 1991; Greenfield 1992).

My own recent efforts to address this set of problems have taken a very different route. Instead of turning to third-world countries undergoing a period of rapid change, my colleagues and I have been creating small model activity systems with their own collections of artifacts, norms, and "designs for living" (e.g., their own distinct cultures) which we embed in various preexisting social institutions. We then trace over a number of years the development of these systems and the children who participated in them.

I refer to the study of the development of these model systems as "meso-genetic" to highlight the "in-betweeness" of the time scale involved. The "meso-temporal" character of these systems is especially relevant to the question of the dynamic relations between different levels of genetic analysis because cultural change within them is rapid relative to the ordinary pace of cultural change in their institutional settings, in the society as a whole, and in the children who inhabit them and give them life. Because of the cycles of activity in the institutions that house these systems, it is also possible to observe several cycles of cultural change in a variety of institutional ecologies, unlike the cross-cultural situation, where the changes of interest are generally a one-shot affair (e.g., once a base 10 counting system has been introduced among the Oksapmin, the "experiment of nature" cannot be repeated). Our meso-genetic methodology also allows us to examine a basic dilemma associated with historical analysis – the fact that, in E.H. Carr's words, we can gain an understanding of the past only from the perspective of the present.

Creating model activity systems

Our research at LCHC using a model systems methodology began in the early 1980s in connection with attempts to create diagnostic/remedial reading environments for elementary schoolchildren who were experiencing difficulties in learning to read (LCHC 1982; Griffin & Cole 1987). In response to the difficult problem of inducing children

who have been failing in school to participate in afterschool reading activities, we divided the children's time between specially designed small group reading activities and a melange of computer-based activities involving computer games and telecommunication. These computer-based activities eventually evolved into a system that we dubbed "The Fifth Dimension" (hereafter, 5thDimension) in which children played games within a loosely structured adventure world framework that appropriated the games to the goals of promoting reading, writing, problem solving, and knowledge of computer-based communication (Cole 1992; Griffin & Cole 1987). I'll have more to say about this particular model system presently.

By our reckoning, both the reading activities and the 5thDimension were successful model systems (Griffin, King, Diaz, & Cole 1989; King 1988). Children came voluntarily to participate in them. These children benefitted from the experience according not only to our criteria, but to those of the school personnel and parents. We also found that the systems offered productive ways to investigate basic theoretical questions about the relation between learning and development. However, in one respect, they clearly failed: no sooner did the period of external support for the research expire than the activity systems came to an end. In this respect, they shared the fate of most educational innovations, even those deemed a success. Such systems are generally not sustained once the external funding that supported them as innovations dried up (See Cole, Griffin, & LCHC [1987] for further discussion).

Distressed by the failure of our model system to survive, despite its demonstrable virtue, we decided to focus on the issue of sustainability. For this purpose, we concentrated directly on the possibilities of using computers and computer-based telecommunications as elements from which to construct activity systems. It seemed to us, on the basis of our limited experience with the 5thDimension, that it should be possible to create activities that would be both attractive to elementary-age school children and effective from the perspective of adults. We decided to create several such systems, each to be located in a different institutional context. We framed our goals in terms of the sustainability of the innovations we introduced: could we conduct our research in such a way that the systems would survive and perhaps even multiply once the project was officially "over." We did not specify the precise content of these systems ahead of time. We simply imagined that they would involve chil-

dren and undergraduates who engaged in some sort of joint activity using computers and telecommunications networks as primary artifacts.

We focused our efforts on institutions that are open to children during after school hours. This focus was motivated by our belief in the potential of such institutions to enrich children's educational experience and to allow a good deal of freedom and flexibility in the design of activities.

We planned for the project to last for 4 years, after which, if any of its model systems survived, they would have to continue to exist on their own. Year 1 would be devoted to goal formation – each institution, in collaboration with the project staff, would investigate a broad range of potential computer-mediated activities for children they thought suitable to their site. Years 2 and 3 would be devoted to creating the system and running it. Year 4 would be the "uptake year" during which each institution would work with the project staff to make the adjustments needed to continue the project once the special funding with which we began had been terminated. That was the plan.

The institutions

Initially we worked with four institutions in a suburban town north of San Diego, California. Each institution deals with elementary-age children: the school system, the library, a Children's Center, and the local Community Youth Club.

The school

The small school district in the town where we worked had two elementary schools, each of which exposed children to computers on a systematic, if not intensive basis. The school made its facilities available to local programs for children during the afterschool hours. A particularly attractive alternative was a special computer room in one of the schools with a number of Apple computers.

The Children's Center

The Children's Center is a community child-care center supported partly by government funds and partly by private funds (mainly tuition). Bureaucratically it falls under the administrative control of the community's elementary school district. It accommodates children of a broad age range, from 2 to 12 years, and it includes programs for infant, preschool, and after school care. Besides an entire program for toddlers, it also has an afterschool program for children of elementary school age. Our focus was on the 45 to 60 elementary schoolchildren who are bussed there after school and remain until their parents pick them up.

On a typical day, the children arrive in their busses about 3:20 P.M. and line up for attendance. This is more than an empty ritual: the Children's Center has legal responsibility for the children until their parents arrive, and if an expected child is absent, the staff must immediately initiate a search for the child. In this way, the center has a rigid structure for child participation (attendance lists and a follow-up on absences), but it has a very informal structure of activities.

The atmosphere is pleasant and the activities available for the children revolve mainly around play and much less on education. After a small snack, the children are free to choose various activities including a prepared arts and crafts projects, board games, outdoor games of many kinds, and free play. There is a strong positive value in promoting the development of the children and a strong negative attitude toward being "schoollike," "not fun," or "stressing."

The Community Youth Club

The Community Youth Club is a nonprofit, privately funded youth center. It is located in a spacious building that houses the staff of the regional club organization, game rooms, an arts and crafts area, a large gymnasium, a swimming pool, and an outdoor courtyard where various games can be played. The club is part of a national organization and this branch is one of three branches that the parent club organization has founded in this and neighboring communities.

Its costs are born largely by individual contributions and special events, supplemented by corporate contributions, membership dues, and program fees, which are kept very low so that all children can participate, regardless of family economic circumstances.

It is intended as a place where children from elementary to middle-school age can go during afterschool hours. The Club complements the Children's Center in many respects. While the Center has a rigid structure about child participants and a very informal structure of activities, the Club has a very rich structure of activities and a very loose set of rules about who comes when. It is located within easy walking distance of an elementary school and a middle school, and a large number of children have ready access to it and can come without requiring parental

assistance or bussing arrangements; but children who live some distance away normally depend on their parents to pick them up. The club provides a wide range of social and recreational activities ranging from indoor and outdoor games and sports to cooking classes, arts and crafts, and so on. These activities are the responsibility of specific staff, who are there to supervise the children.

The basic philosophy of the club is very similar to that of the center: a strong positive value on helping the development of the children and a strong negative attitude toward being "schoollike." In keeping with this philosophy the director of the Community Youth Clubs for the local region stated that part of their policy is to provide the children with a place that "does not taste or feel like school, a place that the children feel is practical and fun" and a place where "the educational objectives must be disguised." Furthermore, the club is self-consciously committed to maximizing the children's freedom of choice, and to allowing them maximum flexibility in participating in different activities with a minimum of supervision. Aside from providing the children with an extensive range of alternatives, there is a general feeling that children ought to be able to begin and end particular activities as they please. Consistent with this "drop-in" philosophy, the children are as free to leave as they are to come. The result, when combined with the wide range of recreational facilities, is a somewhat noisy, boisterous atmosphere, with balls bouncing, children chasing around after each other, a loudspeaker punctuating the activity from time to time to call someone to the phone or announce the start of an activity, and so on.

The library

The library, located in a shopping mall perhaps half a mile from the Community Youth Club, is administratively a part of the metropolitan city County library system. It relies primarily on public funds, supplemented by voluntary contributions of time and money from a community Friends of the Library organization; it charges no fees. Like other local libraries around the country, it attempts to provide a range of informational and educational resources for community members. Thus, in addition to traditional loan services and reference books, it contains a section in Spanish and books on tape. From time to time it puts on special events such as dramatic readings for small children, financial counseling for widows, and in the spring, tax consultations supported by The United Way. Based on this broad range of activities, they were interested in offering special computer activities for children.

Our observations indicated that the number of children present in the library after school fluctuated considerably. On one visit it was estimated that 15 to 20 children between the ages of 6 and 16 were present along with three adults and three staff members. On later visits considerably more adults were present, and quite often one encountered mothers bringing their children in to check out books.

The system of activity – the 5thDimension

Although we entered the project with few preconceived ideas of what forms the activities would take in the different institutions, we assumed they would differ according to local interests. For example, we imagined creating a special "treasure hunt" activity for children at the library. To promote the widest possible range of activity choices, we held a number of workshops for staffs from the different institutions during the first year of the project. As I will explain in more detail later, staff in the different institutions, for various reasons, gravitated toward the 5thDimension as an organizing metaphor for their activities, so I will concentrate here on a description of a generic form of this model system.

Figure 8.1 provides a schematic overview of the 5thDimension as it existed at the three major sites. The central coordinating artifact at the heart of the 5thDimension is shown in the form of a maze divided into 20 or so "rooms," each of which gives access to two activities. The actual maze is constructed of cardboard and is about 1 square meter in size. About three-fourths of the 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. The room which houses the 5thDimension maze also contains a variety of other standard artifacts in addition to computers: A box containing record keeping folders for each child, a computer linked to a modem to enable children to communicate with distant places, maps, task cards that specify how each game is to be played, consequence cards that specify the "next rooms" children can enter when they complete an activity at a specified level of expertise, etc.

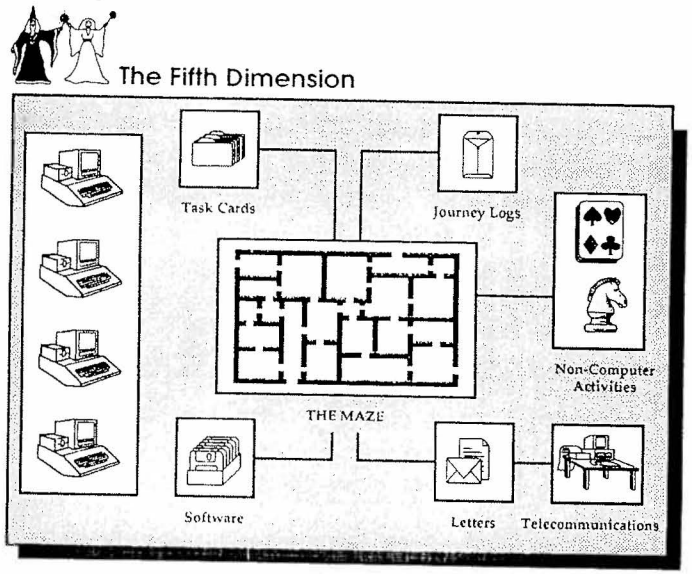

Figure 8.1. A schematic overview of the 5thDimension with the maze used to coordinate access to various games in the center.

According to the rules of the 5thDimension (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 the task cards and selecting their consequences. "Graduation" from the 5thDimension is achieved when children have achieved the good or excellent levels 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 5th 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 entering the 5thDimension. By traversing a path that takes them in one door and out another they may "transform their cruddy creature" and obtain a more desirable figurine. Or they may choose to complete all of the rooms in the maze, thereby earning a special T-shirt, attaining expert status, and gaining access to new activities. In Leont'ev's (1981) terms, the 5thDimension provides a variety of possible effective motives, in addition to motives that are "merely understandable" to the children (such as the need to master new information technologies).

Two other features of the life world of the 5thDimension 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, designer of the task cards, and arbiter of disputes. The wizard is known to enjoy corresponding with children and to have a terrible sense of humor. Because 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 5thDimension activities (with full justification!) criticize the wizard and send her/him (the wizard changes sexes to fit its mood) sharply worded letters of complaint. And, of course, rules of the 5thDimension can be amended through consensus of its citizens by negotiating with the wizard.

The wizard is also an important artifact for reordering power relations between adults and children in the 5thDimension. This rearrangement comes about in part because when conflicts arise in the 5thDimension, it is the wizard, not the human participants present, 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 pretending to believe in 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, because 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 5thDimension.

Second, it is an important feature of the 5thDimension 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. Their assignment is to work with the children in the activities in the role of "wizard's assistants." After every session of the 5thDimension they write detailed field notes about their interactions with the children, the wizard, the software, and the life of the 5thDimension. These field notes are primary data about the workings of this cultural system.

At the University of California at San Diego, which divides its academic year into three 10-week quarters, the 5th Dimension goes through three 8-week sessions that children attend from 1 to 4 days a week, depending upon 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 child and undergraduate "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 5thDimension than the undergraduates; a situation that helps to reorder everyday power relations with important consequences for the dynamics of the interactions that take place.

Some sample findings

With this sketch of the basic structure of the 5thDimension model system and its initial institutional settings as background, I will now present a sample of empirical findings. My goal is to illustrate a variety of ways in which questions about culture-cognition relations can be illuminated by a research strategy that instantiates model systems of activity in different institutional settings.

The process of enculturation

Perhaps my first task is to establish that the 5thDimension *is* a cultural system. This condition seems necessary if I want to conclude that it can serve as a model for the study of culture-cognition relationships.

This is clearly not the place for me to launch into a discussion of the meaning of the concept of culture within a cultural-historical perspective (see Cole 1992; Cole & Nicolopolou, 1991 for a sample of views on this subject). It is sufficient for my present purposes to draw upon the ideas of Gary Alan Fine (1987) whose work on small group cultures informs my thinking on this topic. Fine (1987, p. 124) remarks that "[c]ulture includes the meaningful traditions and artifacts of a group; ideas, behaviors, verbalization, and material objects." From this very general definition he goes on to characterize the cultural formation that emerges in a small group as an *idioculture*, which he defines as

> a system of knowledge, beliefs, behaviors, and customs shared by members of an interacting group to which members can refer and that serve as the basis of further interaction. Members recognize that they share experiences, and these experiences can be referred to with the expectation they will be understood by other members, thus being used to construct a reality for the participants. (Fine 1987, p.125)

As pointed out several decades ago by Rose and Felton (1955) when any group of people come together around a common task, they quickly begin to invent, borrow, and repeat new ways of doing things, that is, to create culture. This process at work in the 5thDimension is apparent to anyone who walks into the room while the activity is in progress. At first it seems sort of chaotic and formless: there are children and adults engaged in a wide variety of tasks; they move around in hard to understand patterns, they say odd things ("Wildcat is down!"; "Right 45 degrees"; "Katmandu"; "I hate the Wizard"), and so on.

This casual observer's sense of crossing a cultural border is routinely captured by the difference between the way that (enculturated) old-timers and (unenculturated) newcomers experience the 5thDimension. Routinely the initial field notes written by the undergraduates 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? (Field notes, JG, 01/20/92)
>
> 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! (Field notes, AO, 10/04/91)
>
> 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! ([Field notes, CM, 10/04/91)

Similar evidence is found in retrospective reports about their experience in the 5thDimension that the undergraduates write at the end of each quarter. Many such accounts begin as does the following:

> On that first day in the Fifth Dimension site I was totally lost. Everything was foreign to me, and everyone in the room was strangers. In the first week of the class Professor Cole

did not clearly explain what we were supposed to do at site, and even if he did, I do not understand the things he was saying.

And with equal frequency, undergraduates report

I got to know everyone at the site very well. We were almost like a little family, because we helped each other and shared ideas about the children. I never would have expected this type of bonding.

My notes started to include statements like, "I asked what I should make. . . . When I explained that . . . I suggested. . . . I told her that . . . I think these statements show that I had begun to define my role in the Fifth Dimension, even though I know this was not a conscious decision.

A second, slightly more subtle indicator of the process of enculturation can be found in a predictable shift in the way in which the artifacts of the 5thDimension mediate the activities of undergraduates once they become familiar with 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 modes of interacting with these artifacts. The first mode might be called *orientational*, in which the person treats the artifacts as "things in themselves." The second mode might be called *instrumental* because the artifact is incorporated in some kind of goal directed action as a mediator.

What makes this distinction particularly interesting in the present circumstances is that there is a shift in the relative use of orientational and instrument/mediational patterns as participants become familiar with the cultural system. At first, field note references to 5thDimension artifacts are primarily oriented toward interpreting and understanding their role in the 5thDimension.

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. (Field notes, LA, 10/1/91)

Here, we learned about the task cards, the hint box, the journey log, the all knowing Wizard and his Wizard's assistants, the Fifth Dimension map, the constitution. Even the Task Cards didn't give you that much advice. (JG, 1/14/91)

Later, as the participants begin to appropriate the culture, they use the task card in an instrumental fashion.

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. (Field notes, LA, 10/31/91)

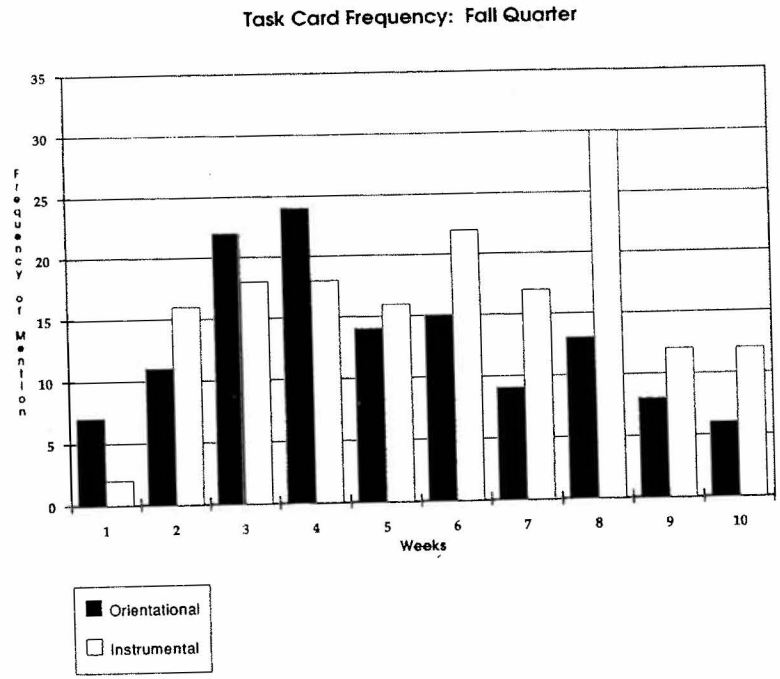

Figure 8.2. The changing frequency of orientational and instrumental uses of the term *task card* in the written discourse of the undergraduate participants in the 5thDimension.

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). (Field notes, CM, 12/5/91)

In the beginning of the game, we were having a really hard time because we didn't know what to do. We both like the sounds that were emitted by the computer, but were frustrated with it. I read the task card again, hoping that it would have more instructs about how to achieve the objective of the game. (Field notes, CM, 04/23/92)

Analysis of the frequency and usage of the two kinds of references to various key artifacts provides a quantitative picture of the shifting understandings that accompany acculturation. Use of the words, "task card" illustrate the trend. As shown in Figure 8.2, in the first weeks of their participation in the 5thDimension, students' use of the task cards is primarily of an orientational nature, but toward the end of the 8-week session, instrumental uses of the task card come to outnumber orientational uses.

Current analyses suggest an additional result. When students continue in the program for two or more "seasons," a 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, 11/5/91)

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 transaction between social groups and their environments. It is equally true, but less generally recognized, that context means more (or other than) "that which surrounds;" rather, "text" and "context" are mutually constitutive of each other. When used in this way, context is a relational concept (Bateson 1972). Our experience with the 5thDimension has made this relational aspect of context too salient to overlook.

In a recent paper, Ageliki Nicolopolou and I compared the cultural systems characterizing two 5thDimensions, one in the Youth Club, the other in the library (Nicolopolou & Cole 1993). These two systems each used the same set of 5thDimension artifacts, ran at the same hour of the day, involved undergraduates participating in the same course, and served children from the same social and economic backgrounds in the same town. Given this commonality of mediational means, institutional purposes, and populations 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 had participated in one of the systems for a while journeyed to the other, they remarked on the difference. The 5thDimension at the youth 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 they often did not seem to know each other well, and there seemed to be a relatively contentious atmosphere and a good deal of horseplay. By comparison, the library group seemed intimate and concentrated; children came on time and stayed until 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 the undergraduates and children and concentration on the games was often intense.

A key to understanding the difference between the two cultural systems is to step outside of them (beyond the walls of the 5thDimension) to examine their local ecologies. When one walks outside the 5thDimension at the Community Youth Club it is a boisterous place with rock music blaring and pool games in progress. Elsewhere children are playing basketball, playing tag, swimming, eating snacks, 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 5thDimension in the Youth Club, as they were free to do at any time, there were many different activities they could engage in; play being the leading activity. The children could even go home if they liked. But when the children left the 5thDimension in the library, they were expected to read quietly and wait for their parents, who expected them to spend the full 1½ hour session there; literacy was the leading activity.

When we combine the information on the differences between the two 5thDimensions with the information on the different relations of each 5thDimension to its institutional setting, we immediately grasp the way in which the culture of each activity (text) is coconstituted with its context (Figure 8.3). Using the crude variable of noiselevel as a proxy for the qualitatively complex differences between the two locations, we see that while the 5thDimension in the Community Youth Club is noisier than the 5thDimension in the library, the 5thDimension in the library is *noisier* than its institutional context while the 5th Dimension in the Community Youth Club is *quieter* than its institutional context.

The qualitative features of each 5th Dimension are created in the relationship of text to context. Each 5thDimension mixes two leading kinds of activity – education and play. When placed in the institutional context of the Youth Club where play dominates, the educational features of the 5thDimension render it relatively more serious and educationlike (quiet). At the same time, when placed in the institutional context of the library, the play features of the 5thDimension make it noisier and more playlike than its sober-minded educational setting.

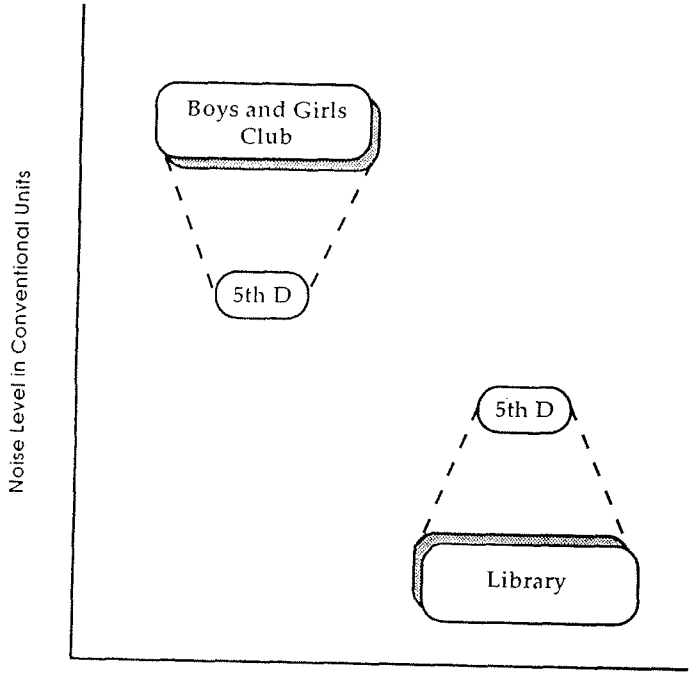

Figure 8.3. A schematic representation of the boisterousness of activity in the library and Community Youth Club 5th Dimensions. Note that while the club is noiser than the library and the 5th Dimension in the club setting is noisier than its counterpart in the library, the library 5thDimension is noisy relative to its context while the club 5thDimension is quiet relative to its context.

The relation between cultural level and cognitive achievement

A long standing issue in the study of culture's impact on the development of thought is the relationship between the level of knowledge characteristic of a 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 8.4 shows the changes in performance on one of the games in the 5thDimension over the course of the year in the two settings. Note that in the Youth Club there is no overall growth in the level at which the game is played; performance at the beginning of the year is low yet better, on average, than at the end of the year. By contrast, performance improves with the growth of the culture of shared knowledge in the library. These and a number of measures of the density and growth of the cultures of the two 5thDimensions confirmed that there was little cultural growth during the year at the Youth Club, but marked and sustained growth at the library.[3]

We are currently investigating a number of other issues relating culture and individual development in the 5thDimension. These include ontogenetic differences in the motivational properties and learning potential of particular computer-based activities, the ways in which new artifacts are invented and diffused, the interpersonal origins of intraperson strategies, the role of inter-site communication as a source of cognitive goals, the conceptual development of the undergraduates who participate in the system, and many more. While these topics are deserving of discussion, I want to spend the remainder of this chapter discussing how the way in which we can study historical change in the 5thDimension activity system affords insights into more traditional questions of historical analysis.

Investigating historical changes in the activity settings

As I noted earlier, when we embarked upon this project a major focus was to determine if it would be possible to create sustainable innovations in activity. By its very nature, research on sustainability requires that one continue research long enough to determine if the new activity system that has been created will continue to develop when it is no longer being force fed by outside research monies.

At the very start of the project, we made it clear that at the end of a 3-year period the external funding for the project would come to an end. We promised that at that time, we would be prepared to continue populating the 5thDimension with eager undergraduates who would be directed by a professor as part of a regularly scheduled course at the university. The university would also continue to provide telecommunications facilities so that the children could communicate with the Wizard as well as children in other parts of the country and the world. But we would no longer provide the computers, software, or the labor of a site coordinator: these would be the responsibility of the local institution.

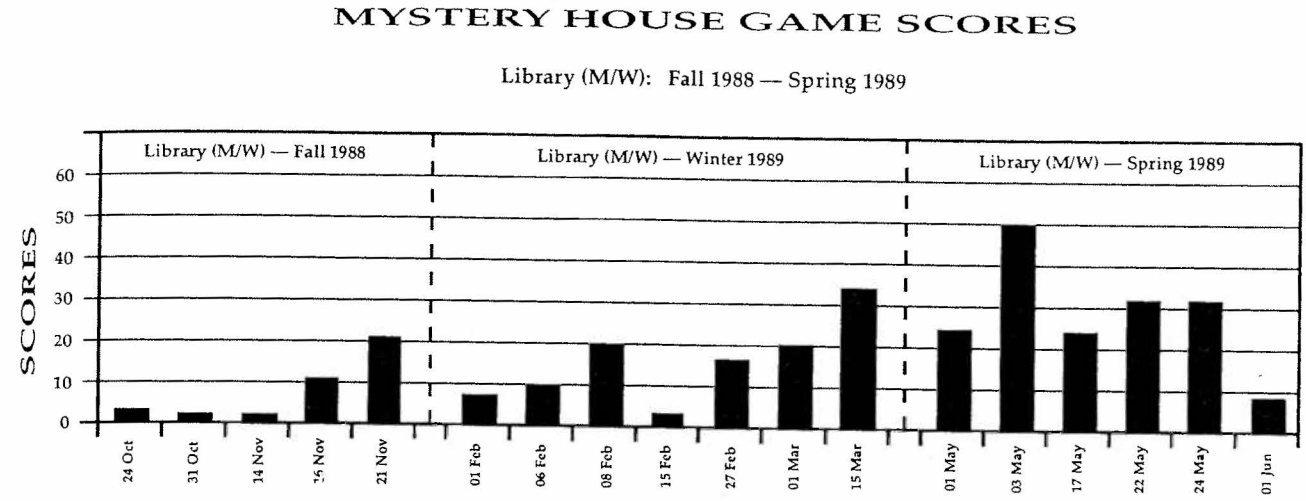

Figure 8.4. Changes in performance when children play a game in the library and the Youth Club over the course of one year. Note that the improvement is greater in the library, bespeaking of denser culture of shared learning (continued next page).

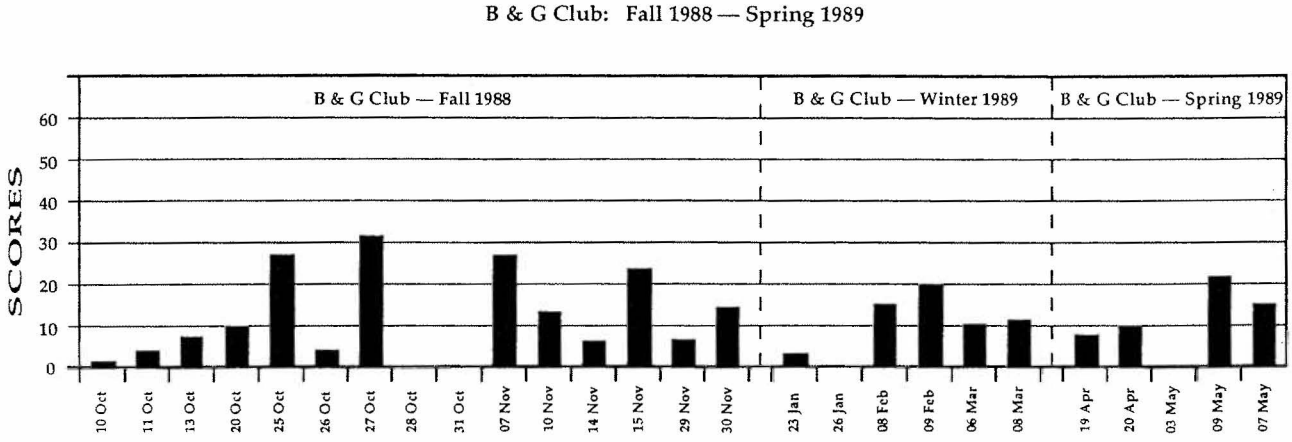

Figure 8.4. (continued)

From the field note citations and the general presuppositions of my exposition thus far, it is clear that the 5thDimension has survived for a considerable period of time. As this chapter is being written, the 5th-Dimension is entering its seventh generation of existence. The 5thDimension has not only survived, it has "gone forth and multiplied." In place of the three systems and three community institutions in a single suburban town with which we began in the fall of 1987, there are now 10 5thDimensions spread across 6 communities in 4 states and 2 countries, and more appear to be "in the oven."

This simple quantitative summary is misleading, however. The history of the 5thDimension has not been one of uniform development and continuous growth. Rather, each local 5thDimension has undergone its own distinctive process of development. And for some, development has ceased; these systems have died.

How are we to explain these different developmental outcomes? It is in attempting to answer this question that we return to the difficulty of historical explanation posed by E. H. Carr cited at the beginning of this paper, the fact that our understandings of history can be achieved "only through the eyes of the present."

Many years ago Sigmund Freud pointed to the limitations inherent in such retrospective analysis in the case of human ontogeny:

> So long as we trace the development [of a psychological process] from its final stage backwards, the connection appears continuous, and we feel that we have gained insight which is completely satisfactory or even exhaustive. But if we proceed the reverse way, if we start from the premises inferred from the analysis and try to follow these up to the final result, then we no longer get the impression of an inevitable sequence of events which could not be otherwise determined. We notice at once that there might have been another result. (Freud 1920/1924, p. 226)

Precisely this duality of vision, I believe, can be retrieved by the study of "activity genesis" in the model systems I have been discussing. To get a feel for how this process works, I will first describe how matters appeared "looking forward" from the point in 1987 when I interviewed the personnel at each site about their plans and prepared to launch the three activity systems for the first time. My evidence will be the audiotapes of the planning meetings. Then I will give an account "looking backward" at the end of 4 years when, it was hoped, all three systems would have achieved a sustainable state.

Imagining the future: The end of the year interviews

In the beginning, when the future lay before us, we were naturally planning for the long-term success of each of the systems we set up. We had spoken with supervisory personnel in each institution and all had expressed their interest in collaborating with us as a condition of obtaining the grant and undertaking the work. We knew from the very outset that the local institutional goals and arrangements for achieving those goals at each site produced very different patterns of possibilities and constraints for incorporating new activities of the kind we were proposing. But we had no reason to predict success in one case or failure in another.

The first, "goal formation" phase of the research – which extended from July, 1986 to approximately September, 1987 was conducted under the direction of my colleague, Peg Griffin. It was designed to help the participating community institutions to come up with a plan for the content and structure of the future activities that would suit their local institutional goals and to get an overview of the after-school facilities for the children in these institutions as baseline data against which to evaluate later changes. It was evidence from this initial phase that generated the descriptions of the institutions presented earlier in this chapter.

During the year, project staff made regular visits to the sites; they also held seminar/workshops involving representatives of all of the initial community sites. The workshops introduced potential site personnel to a wide variety of activities involving computers and communication. The project director (me) did not participate directly in these activities. I entered the project directly only at the end of this "embryonic" period, when it was time for local institutions to "give birth" to the activity systems they had settled on during Phase 1. In the late summer of 1987 I conducted interviews with staff members at each of the institutional sites. These interviews served a dual purpose. First, they provided me a chance to have the institutional personnel explain their versions of the events of the previous year and to discuss their plans for the start of the activities (which were planned to coincide with the start of the academic year at the university). Second, they gave me my first real glimpse of the challenges I would face in creating a system of activities at the university that would provide the needed support for the community systems to grow and prosper.

In each case, as the interviews clearly demonstrate, the concretization of their plans required concretization of my plans: I had an incoming class of students appearing in a few weeks time, and it was imperative that I learn what I had to do to satisfy whatever plan I agreed to in these interviews. When I told my colleague Roy D'Andrade about this work at the time, I evoked the following, wry, expression of the position I had placed myself in. "Doing social science," he said, "is like being a geologist who studies rocks in a landslide." That captured the phenomenological situation all too well.

The institutions

I will report on interviews with only three of the initial four institutions because the school system dropped out of the project well before implementation of any plans was undertaken. They offered to provide support for the Children's Center as their contribution to the project.

The Children's Center

When I met with the directress of the Children's Center to debrief her on the previous year's experience and to elicit her formulation of goals for the coming year, the directress's first comment was that the teacher she had planned to have specialize in computer activities was leaving. Her goals, she said, remained the same as they had been a year earlier: to find a way to "have the kids, when they are here, be interested and stimulated by the activities." She was especially interested in activities for third and fourth graders, the upper age range of children attending the center after school. Beyond this initial general goal, she found it difficult to be more specific and as a consequence, the conversation proceeded with me asking leading questions, from which she chose alternatives (e.g., "How many kids would you like to have involved?" "How many days a week?" "From the workshops, what kinds of activities would you like to have the kids engaged in?"). The result of this exercise was a decision to have 6 to 10 children play interesting educational games "like Oregon Trails" twice a week with two university undergraduates present each session using the 5thDimension as an organizing metaphor.

Next the discussion turned to computers and telecommunication facilities. The directress was somewhat concerned about the costs of telecommunications and was reassured when she learned that only a local phone call was involved. She was also confident that getting computers for her children to use was not a problem, because she had been assured of support by the computer coordinator of the school system.

One topic that the directress initiated was the process by which we would select the students who would be coming to the center.

> One of my concerns . . . I'm not particularly concerned about it but I want you to be aware of it, is that I am not in the classroom and parents, because of day-care problems, if they see a young man on campus, they are going to want to know everything about that young man. So, there isn't someone in that group that . . . you have assistants but that person is not on site. [She was assured that an assistant would always be present] . . . OK, that's the one I could coordinate with.

In further discussion, I explained the entire dynamics of supervision of the students and it seemed that the matter was resolved. However, near the end of this part of the conversation, the directress mentioned the issue again, commenting that she would have to check with the organization that licenses the Children's Center about the proper procedures for dealing with the students.

In this case, it did not take long for our predictions about the future to go awry.

One week following this interview and 1 week before courses began at the university, we held a second meeting at the Children's Center that was attended by the research assistant who would have responsibility for running the activities and the computer supervisor from the school district. It was clear that a good deal had changed in a week's time. The directress opened the discussion with the comment, "You know how I am feeling. I really don't have time for a lot of theoretical kinds of things." I emphasized that this was a meeting to determine as precisely as possible what she wanted the research team to be doing 3 weeks hence when, according to the previous week's discussion, the activity should get under way. The directress replied:

> Let me tell you how this was presented to me initially. "E" [a local school official] came to me and presented me with this bountiful platter. I've tied up this wonderful thing at the public university. They will send a student in and they will train your kids on the computer. That's what my goal is, I am very simplistic. Now I am ending up where I am going to in-services, I had to release my secretary to go to an in-service, I had a teacher at in-service two days, all of which costs me money. . . . Now that teacher has left and I do not even have a teacher who can coordinate this thing. . . . So what I was looking for was someone from the university to come in and work with the children. And when I was

talking to [the research assistant] the other day she was saying that I had to get a teacher involved.

Here we have a clear example of the failure of the goal formation process during the first year and an expression of additional obstacles to long-term success. But we were undeterred. I assured the directress that all we were asking presently was where physically she wanted us to work and with whom on what basis. She next brought up the fact that "all of these people have to be cleared." We had already taken steps to comply with the clearance procedures and were planning to take responsibility for it, which seemed to relieve her, but her list of concerns was long and pressing.

Next she stated that she needed a limit on the number of people who came because "whether you have someone in charge or not, I still end up being the one who has to supervise. . . . So I don't want several students from the University coming in or various students." Because we had agreed the previous week to have two students come on a Tuesday and two on a Thursday, the somewhat strained way in which this list of concerns was posed was a little disconcerting, but we simply reiterated our understandings, which already relieved the Children's Center staff of all but the most minimal responsibilities and the directress seemed to be reassured. These "internal" issues settled, she now brought up some new concerns with the statement, "Since you were here last week, some things have changed." (Which was certainly clear enough from the change in the atmosphere of the discussion!) The crux of the change was the opening of a new after school center in the same school district but in a neighboring town to which the bulk of the older children attending the center were to be assigned. Since the directress had initially wanted us to work with the older children and had seen software appropriate to older children, this shift in local organization appeared to her as a difficulty, and indeed it turned out to be one.

In the discussion that followed, it was agreed that we would, despite the change in student composition, go ahead with the project, beginning with some new observations of the conditions that obtained at the present moment, and continuing with a plausible form of after school activity that involved children with computers a few weeks hence, once four appropriate undergraduates had been chosen and trained. We emphasized that we were not in a hurry, that whatever we began with would deliberately be incomplete, so that we could cooperate with whatever

staff were present to build something that worked for the Children's Center.

Returning to the concrete plans for the start of activities, we suggested that 5 computers be made available for approximately 10 child-participants. At this point, the computer supervisor for the school district, who was present at the meeting as in his role of facilitating the participation of the Children's Center, asserted that although they were a relatively affluent district, they could not provide any help with computers (contrary to prior promises). His justification was an interesting "Catch-22": they had discussed placing computers at the Children's Center, but the rapid staff turnover precluded training a person to work with them. Our response was simply to formulate this difficulty in theoretical terms and to take it in stride as something to be dealt with as part of the project. As I put it in the discussion:

One of the things I see happening over time – this is also a problem at the Community Youth Club but not so much at the Library, each of these institutions being different – is to address the question of how to create a continuous program in the face of discontinuous staffing and computer support. I think this is a problem that the University can really worry about. How can we over the long run provide a kind of continuity that will provide a kind of on-the-job training while helping the teachers to do their thing? I think that's a serious responsibility of ours. (Fieldnotes, September 16, 1987).

To this day we are not certain of all the dynamics at work in this situation. We know that one of the unspoken pressures on the directress was to move our activities from her center to the new facility a few miles away, which she and we were resisting. It is possible that support from the school district was eroded because we would not move our operation from that center to a new one.

The Community Youth Club

At the very outset of our end-of-year interview with the educational director, we were confronted with the problem of unstable staffing; in two weeks she would be leaving the Community Youth Club and no one had yet been hired to replace her. To compensate for this circumstance, the interview was carried out as if she were not leaving so that we could assess how far the process of goal formation had proceeded, even if subsequent development was endangered by the discontinuity of staff changes.

The educational director started her account by pointing to two computers without monitors, which she had checked out with the LCHC staff member who had been making observations at the Community Youth Club in recent months. She had a pretty explicit idea of what she wanted to do.

I am hoping that two TVs will come in [through donations] that I can put these [computers] up to for a permanent thing, like they can be right here so that whenever the kids want they can access the computer. Otherwise I have to set up certain times of day, or one day a week, and that doesn't work for all the kids that come to this club. It's easier to get more kids involved if I leave it set up. I will hopefully start up the Fifth Dimension. I just want to make the box and that type of thing and function just like we were [during the workshops] using the games that we have for these computers in the Fifth Dimension. That's as far as I've gotten so far on the planning. (Interview, Aug. 24, 1987)

Discussion moved on to a consideration of telecommunications plans. At the time of the interview, the Community Youth Club was at a low point in fundraising and the cost of putting in a phone line to secure telecommunications was still a low priority. However, existing phones in a room not too far from the computers were put at our disposal on a "use if available" basis.

As we worked through scheduling, the educational director reiterated that she hoped to see the Fifth Dimension operating on as constant a basis as possible. In practical terms she imagined that this would mean that it would be available from 2:30 P.M. to 5:00 P.M., 4 or 5 days a week. We suggested that perhaps it would be possible to schedule children to come on Tuesday and Thursday or Monday and Wednesday [implicitly thinking in terms of university schedules and a means of providing a structured way of interacting with the children, and using the way that children were scheduled to use the swimming pool].

Cole: "The way the thing works, would it be like a club or would the kids drift in and out?"

Educational Director: "Drift, because they have more of a record with me of doing that. They drift in, they get real excited about it; then they get excited about something in a different area of the club and if I have it here for them to come back to, that is the way it will work."

(Here the linearity of my exposition clashes with the non-linearity of the perspective I now share with the reader. In light of later developments in the Community Youth Club, as the reader knows from reading earlier sections of this chapter, this exchange is especially important,

because of the relative degree of structure within the 5thDimension was [and remains] a constant issue in its development, as the comparison with the library indicated.)

A goodly part of the interview was devoted to discussing the possibility that the Community Youth Club's older children, who participated in a service club, might play a special role in the development of the computer activities.[4] This idea appealed to the educational director, who was experiencing difficulty in creating a cohesive teenage service group and thought that the teenagers might find "service" in the 5th Dimension attractive. We liked this idea a lot because it was an obvious source of additional person power for the activities.

The library

Four people representing the library participated in the end-of-year interview, the local librarian and a staff member, as well as two county-wide library employees, one of whom specialized in "technical resources," the other of whom was the supervisor for libraries in the region. In light of staffing problems encountered at the Children's Center and the Community Youth Club, it is worth noting that one staff member who had participated in the workshops had already left the library for another job and that the local staff person present would soon depart.

The interview opened with a review of the library's goals for involving children with computers during afterschool hours. The librarian stated that the basic goal should be to introduce the children to the library through a computer-based educational program that would show them the resources that the library possesses and how to use them. This idea had a history considerably longer than the project, dating back to 1983 when it was raised at a meeting of the local Friends of the Library by my wife, who was a founder of the library support group and who knew about earlier after school work by LCHC. In addition, the librarian reported that a computer had been donated to the library, and they were in the process of figuring out how it might be used by adult patrons.

I asked about the workshops and ideas for activities that arose there. The librarian said that she had been impressed by the afterschool activities that had been reported on during the workshops and that she had especially enjoyed the 5thDimension games where she had learned a lot.

Hence, here too the 5thDimension was chosen as the medium for creating a new form of activity.

When asked about telecommunications, the librarian reported that a telephone line was "in the works" and that the Friends of the Library had provided a budget of $2000.00 for computer activities, a sum that we all agreed was very large. In discussing how this money was to be spent, we explored ways in which LCHC could fill in with certain kinds of equipment in order to allow the library to stretch their budget as far as it could go.

This line of discussion brought the technical resources person into the conversation. She recounted the sad experiences of local libraries which had installed computers for use by patrons, explaining that as a result of prior experiences branch library staff didn't want to have "anything to do with this type of thing." (She offered the interesting rationale that "when a computer breaks down, you have an irate customer.") This concern led to a discussion of ways in which the program for the children would avoid these problems, since we were not proposing to use coin operated computers. This topic brought out the next level of difficulties, that the branch libraries did not have staff who were trained in the use of computers. Our program also seemed to offer a solution to this problem because we had spent a good deal of time working with branch personnel and we were planning to have a knowledgeable staff person present when the computers were in use.

As examples of this variety in the ways that computer could be used, we talked about two different kinds of computer-mediated activity that the librarian had already indicated interest in: an adventure game that would teach children about the library, and the 5thDimension, which had impressed her during the workshops.

We then went over scheduling. The library folk had no clear idea of how often or for how long they wanted the activity to go on. I raised possible problems – if there were too many children or the activity went on a lot of the time, in particular, the possibility that the children would become noisy or disruptive of other activities. Prompted to consider if they wanted the activity every day or less frequently, they decided that twice a week would be about the right level to begin at. The issue of how many children would be involved was not taken up, but it would surface again later, along with other issues signaled in this discussion, to play an important role in the evolution of these activities.

Looking backward

I hope that my brief description of the planning meetings held in 1987 is sufficient to give the reader a sense of how difficult it would be to predict the fate of the systems we were launching. About the only thing I could or did predict about the future of the activity settings we created in 1987 was that they were going to require a lot of work. That each site provided its own set of problems was, of course, obvious. But our ability to deal with those problems in a developmentally productive way was not.

Looking backward is a whole different matter. Here is a synoptic account of how things turned out.

As mentioned earlier, the school's involvement with our project survived barely beyond the time when the grant moneys that launched the projects were made available. The school, of course, had the greatest computer resources for such a program, but it was not willing to run the risk of damage to any of its equipment. Although the school proposed that it remain involved by helping the Children's Center to run its program, this collaboration didn't develop. We later learned that there was hidden antipathy toward our project on the part of the district computer supervisor, who perceived our efforts as criticism of his own program of instruction in the schools.

Next to drop out was the Children's Center, where our activities continued only two-thirds of the 1987–1988 academic year. The "death" of the Children's Center 5thDimension was not the result of the failure of the activities to please the children. In fact, not long after starting the program, at the request of the center staff, we modified our procedures to allow access by more children so that all of the kids could get a chance to participate.

From the interviews between the first and second years of the project two threats to the viability of the 5thDimension at the Children's Center were visible. First, there was the reluctance of the directress to assign staff to work with us. Second was the concern over strange adults coming into the facilities and the concomitant additional work involved.

Staffing the 5thDimension was a problem, but it was not decisive in bringing about its demise. LCHC staff were stretched thin to meet the demands of running the program in three locales more or less simultaneously. This situation was not helped when the school system backed out on its promise of support in terms of computers, as a result of which

we found ourselves hauling computers from one part of town to another with fatiguing regularity. But we were managing.

The straw that broke this camel's back was generated by the concern over child abuse. As a result of publicity surrounding the McMartin case in Los Angeles and a high level of concern about child abuse more generally, the agency that licensed the Children's Center insisted that all adults working in a day-care facility register their fingerprints with the Department of Justice and obtain a TB test. Students could obtain the TB test quickly and without cost, but the fingerprinting was time-consuming and cost $16.50 per person, which the project had to pay for. Money was not the problem here. However, when it is remembered that the university works on a system of 10-week quarters, and that the research project had to have checks issued by the university for the costs involved, it is clear that this procedure put a heavy administrative burden on the project, quite apart from any direct costs involved. This effort might have seemed sustainable if we had the impression that the center directress was satisfied with the way the program was going; but she was not. She was pleased with the quality of the activity and the enthusiastic participation of the children, but the administrative overhead of running the program was wearing her out. When a new group of students appeared at the start of the second quarter, her stress was obvious. She was very grateful when we suggested, prior to the start of the third quarter, that we suspend the project.

The library, which was the most successful of our systems from the perspective of its impact on the children, thrived so long as it was run entirely by LCHC research staff. But when it came time for the crucial transition to "steady state," the directress of the Library declined to continue the activities. As in the case of the Children's Center, there is no "villain" in the death of the Library system. Rather, there was a failure to form a working synergism.

During the project we worked with the staffs of the local institutions to build expertise in the running of the 5thDimension and we helped them raise money locally to begin the process of replacing hardware and software. We created special activities in the 5thDimension that required the children to acquire library skills and we met with them 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, etc. Each of these problems could have been solved, but the fact of the matter was that even if the money was available, and even if volunteers stepped in to help, the librarians had come to the conclusion that the 5thDimension did not fit closely enough with their main goals as librarians. And that was the end of that.

Looking back at our interviews in the summer of 1987 it seems clear that the reasons for the ultimate failure of the system at the library were articulated during the discussion, although we could not hear them at the time. First, as things developed, we lost sight of the fact that the 5thDimension was planned to be only one element in the activities. The computer-based game that would teach children about how to use libraries did not get written and various plans to have the children use telecommunications for library purposes also failed to develop. This was not a simple oversight, but arose in connection with the fact that our staff was so busy putting together three systems at one time (remember, the most we had ever run before was one), that insufficient resources were put into this aspect of the library activities. While we sought to compensate for this failing by linking various 5thDimension activities to the library in the spirit of the initial plans, the resulting linkages were too few to be readily visible.

By contrast, the 5thDimension at the Community Youth Club not only grew but gave rise to two new 5thDimensions in clubs in two neighboring clubs. The club gave the program an award and embraced it as an important new addition to their program. They did not shy away from picking up responsibility for paying a site coordinator and providing the needed support for computers and telephone lines when the time came. The university also upheld its part of the bargain, making its mainframe computer available for use by undergraduates and children, supporting the teaching of a special course three quarters a year, providing the help of a teaching assistant, and even provided some technical support for computer use by the undergraduates.

The death of the library system and the continued growth of the Community Youth Club system 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 are to be found there any more. On the other hand, the very properties that weakened the developmental impact of the 5thDimension in the Youth 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 9.3 takes on added significance. The fact that the library club was noisier than its setting, while being quieter and more studious than the Youth Club, turned out to be a major factor in its eventual demise, while at the same time it was a major factor in shaping its desirable characteristics from a psychological perspective. By the same token, the fact that the Youth Club 5thDimension was quiet compared to its surroundings confirmed its (relatively) educational nature (relative to the other activities at the Youth Club), made it a feather in their cap.

Viewed retrospectively in this manner, the success of the Youth Club 5thDimension and the demise of the other two systems is perfectly understandable and seems almost inevitable. In fact, when I went back to listen to the tape recordings of the planning interviews, I was shocked at how clear it seemed now that the factors which would lead to the demise of the 5thDimesions in the Children's Center and library were clearly present in the conversation in the beginning. The Children's Center directress made no secret of the problems associated with bringing strange adults into her facility, nor did she minimize rapid staff turnover or the difficulty of having any of her staff take responsibility for the activities.

Similarly, the library personnel were pretty clear that they wanted an activity that would help them fulfill their institutional goals. They knew they wanted to have children using computers, but they could not imagine how this would be accomplished, even after a year in which they were exposed to possible models. As in all the sites, goal formation was so feeble, that the most understandable activity, the 5thDimension, served as a stand-in for a specifically tailored activity. Ironically, the better the 5thDimension worked on its terms, the more encapsulated it became within the library. Its "local" success was part and parcel of its "global" failure.

This lesson is clear in a different way at the Youth Club. The porous borders of the 5thDimension at this site were a constant concern for us all during the project. We all felt that the library's 5thDimension represented an almost ideal instantiation of our goals in creating a model afterschool activity involving a large educational component. What we considered to be the sloppiness and chaos of the Youth Club 5thDimension turned out to be its saving features, when viewed in terms of its integration into its institutional context. The shortcomings we perceived in the 5thDimension at the Youth Club were, in important respects, our problem, and not a problem for the children or the staff.

Some concluding comments

Despite the complexity of the topic I have addressed and the brevity of this presentation, I hope that I have made a plausible case that the meso-genetic methodology I have been describing has potential for addressing issues that Sylvia Scribner raised in her work on history and psychology. As noted early in this chapter, Sylvia sought ways to illustrate the idea that historical changes a different systemic levels (genetic domains in Wertsch's [1987] terminology) interact in the construction of development. Moreover, she emphasized that both individuals and sociocultural systems are active agents. Our results are replete with examples of these principles. To take perhaps the most obvious example, we saw that the cultural circumstances created in the 5thDimension at the library afforded a dense culture of collaboration associated with a high level of cognitive development; but the excitement generated by these same circumstances, which were vital to the emergence of the development-enhancing cultural circumstances, were also productive of a high level of excitement. This excitement was manifested not only in higher cognitive attainments, but higher noise levels, which in turn contributed to the rejection of the 5thDimension by its institutional context when extra-systemic resources (in the form of grant support) were withdrawn.

This work also illustrates how one's evaluation of a developing activity system depends upon the level of the system at which it is evaluated. Viewed at the level of individual development within the 5thDimension, the library system was superior to the Youth Club 5thDimension. But viewed at the level of activity system genesis, the Youth Club was superior. The obvious challenge posed by these results is to seek ways of

modifying the Youth Club 5thDimension in the direction of greater impact on individual development while retaining its positive synergistic relationship to its institutional setting.

Many potentials of this approach have not been discussed here owing to limitations on space. We have copious data on changes at the microgenetic level which focus in on the processes that result in evaluations of greater or lesser cognitive impact of various 5thDimension cultures. We have also, owing to the continued development and diffusion of such activity systems, had the opportunity to explore a far wider range of institutional ecologies and resulting idiocultural configurations. And, of course, there are our plans for the future, that untravelled world, whose margins continue to recede as we move toward them.

I consider myself fortunate to have been able to count Sylvia Scribner as one of the sojourners on this voyage of discovery and rediscovery. It is one of the gifts of culture that even in her absence, the conversation we began can be continued by those who remain behind . . . or is it up ahead?

Notes

1. Sylvia stated her goal in this paper to be an exploration of the question, "What is history?" in the psychological theory of L. S. Vygotsky. She gave me a copy of the E. H. Carr treatise on this topic from which the second epigraph to this chapter was taken not long after we met.
2. James Wertsch has also written extensively about the importance of including different "genetic domain" within a cultural-historical framework.

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9 The abstract and the concrete

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Despite fundamental differences in foundations between activity theory and dialectical logic on the one hand, and mentalistic cognitive science on the other, some particular substantive concerns within these perspectives have points of contact with one another. One such question, the focus of this chapter, has to do with the distinction and the relations between the abstract and the concrete.

Although the analytical categories of abstract and concrete span a range of content areas, this chapter will center on thinking and inference. I will examine some current discussions of the role of abstract/formal processes and contentful/situated processes in language and inference, grounded in the mentalist cognitive framework, and juxtapose these discussions with analyses of abstract and concrete forms of thinking provided within dialectical logic and activity theory. Within their respective aims, both these frameworks have needed to posit and to define distinct modes of thinking and to investigate theoretically the relationship between the two.

The question of the relations between the abstract and the concrete is configured by the conceptual framework of each theory and driven each time by theory-internal problematics. Concepts are never defined in isolation, but rather derive their meaning from their relations to other concepts within a coherent theoretical system (e.g., Wiser, in press). Of necessity, this imposes constraints on the comparability of concepts across theories. Despite those constraints, it is the aim of this chapter to probe the points of contact, of mutual resonance, and of opposition between the two kinds of theoretical descriptions of abstract and concrete phenomena, and to examine how these oppositions are imposed by differences in foundation between the two frameworks. This goal is

I thank Katherine Nelson and Ethel Tobach for thoughtful comments and suggestions. This chapter is dedicated to Sylvia, in memory of our friendship and our conversations on these matters, and with appreciation for bringing Ilyenkov to my attention.