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PLANNING AS DEVELOPMENTALPROCESS

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I. INTRODUCTION'

II. PLANNING AS PROCESS

III. ACCOUNTSOFTHEDEVELOPMENTOFCHILDREN'SPLANNING SKILL

IV. DEVELOPMENTAL ACTIVITY APPROACH

V. PLANNING: DELIBERATE EFFORTS TO REACH GOALS
A. GOALORIENTATION, DELIBERATENESS, AND MEDIATING MEANS
B. THEDEVELOPING FOCUS OF PLANNING: AUTOMATIZATION

VI. FLEXIBILITY IN PLANNING:SYNTHESIS OF ADVANCE PLANNING AND IMPROVISATION
A. FLEXIBILITY IN PLANNING WRITTEN DISCOURSE
B. FLEXIBILITY IN DESIGNING PLAYS

VII. THE SOCIAL AND CULTURAL NATURE OF PLANNING
A. THEINTERPERSONALCONTEXTOFPLANNING
B. THESOCIOCULTURAL INSTITUTIONS OF PLANNING
C. CULTURALTOOLSFORPLANNING

VIII. CONCLUSIONS

REFERENCES

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ADVANCES IN CHILD DEVELOPMENT AND BEHAVIOR. VOL. 24

> The aim as it first emerges is a mere tentative sketch. The act of striving to realize it tests its worth. If it suffices to direct activity successfully, nothing more is required, since its whole function is to set a mark in advance; and at times a mere hint may suffice. But usually-at least in complicated situations-acting upon it brings to light conditions which had been overlooked. This calls for revision of the original aim; it has to be added to and subtracted from. An aim must. then, be *flexible;* it must be capable of alteration to meet circumstances. An end established externally to the process of action is always rigid. Being inserted or imposed from without. it is not supposed to have a working relationship to the concrete conditions of the situation. What happens in the course of action neither confirms, refutes, nor alters if. [The legitimate aim] is experimental, and hence constantly growing as it is tested in action.
>
> (Dewey. 1916. pp. 122–123)

I. Introduction

Our goal in this article is to discuss planning as a process, focusing on the dynamic and evolving nature of planning as it unfolds *during activity in individual*, social, and historical time frames. Traditionally, the study of planning has focused on the possession of plans rather *than* their development. The development of skill in planning has been regarded as the cumulative acquisition of plans along with an increase in planning in advance of action. We argue for the importance of viewing planning as a process of transformation of opportunities for upcoming events, with development involving learning to plan opportunistically-planning in advance of action or during action according to the circumstances, flexibly anticipating constraints and opportunities, and adapting to circumstances.

In this article, we explore planning as an activity engaged in by individual\ and groups embedded in sociocultural activity. We characterize the changes in planning processes over individual development in terms of developing plans over time according to the material and interpersonal circumstances of the sociocultural activity in which planning occurs. Planning by individuals often occurs with and develops in coordination with other individuals, and always occurs in the context of cultural activity. This is the case for planning in imaginary problems in the laboratory, planning real errands, and planning in play. We use examples from each of these situations to develop the idea that planning is itself a developmental process and that the development of planning skill involves facility in managing sociocultural activity with flexibility, creativity, and foresight

First, we expand on our contrast between planning as a process as opposed to planning as selection of stored plans. We then consider how researchers have characterized the development of children's planning skill, usually limiting their view to the individual level of analysis. We then describe the developmental activity approach, which has inspired our work and which promotes analysis of processes across levels of activity. This section leads to consideration of a definition of planning, stressing the importance of flexibility in planning, which becomes clear once our view of planning is expanded beyond the individual level to include material, social, and institutional circumstances. Finally, we examine how planning is integrated across individual, interpersonal, institutional, and cultural levels.

II. Planning as Process

Our view of planning focuses on the process involved in developing approaches to handling problems, rather than regarding planning as the passive possession of plans as mental objects. We emphasize the development of planning rather than the acquisition of plans. Taking an active view of the process of planning makes it easier to avoid what we regard as a widespread pitfall in cognitive psychology-the attempt to reduce problem-solving processes to the possession of mental objects, such as plans, concepts, thoughts, emotions, or motivations (Rogoff, 1990). For example, teachers' lesson plans are often regarded (by teachers and by researchers) as rigid plans in the heads of teachers, inflexible rather than dynamic. Children's, chess players', and problem solvers' plans have been seen like computer programs, filed in their heads and only needing selection. We are interested in the process of planning-an inherently developmental process-rather than the possession or acquisition of plans. As Rogoff (1990) stated, "The purpose of cognition is not to produce thoughts but to guide intelligent interpersonal and practical action. A problem-solving approach places primacy on people's attempts to negotiate the stream of life, to work around or to transform problems that emerge on the route to attaining the diverse goals of life" (p. 9).

Consistent with the active approach that we take is an integration of cognitive processes that in more static views have often been separated. We are concerned with understanding how people manage anticipated problem situations; it is not our aim to separate planning from remembering, problem solving, feeling, thinking, wanting, and creating. Indeed, we do not regard these as separate processes.

We also take the view that planning involves creating (Baker-Sennett, Matusov, & Rogbff, 1992). Though much of the literature on planning focuses on the acquisition of plans, a process approach emphasizes the creation of changing solutions to problems. Although children must work within the boundaries of contextual opportunities and constraints, they often operate as free agents who create opportunities, goals, and flexible means by which to reach these goals. Regardless of whether children's planning entails figuring out how to write a classroom assignment, to navigate their way in an unfamiliar neighborhood, or even to develop new ways to torment a sibling, it is an active and creative process.

Our emphasis on planning as an active process is related to our stance on planning as action rather than as mental representation. The traditional view of planning portrays it as a process built on shuffling around mental representations (Fabricius, 1988; Klahr & Robinson, 1981), with most attention devoted to characterizing potential mental representations and little devoted to how the shuffling occurs. The use of latencies to infer planning processes seems to bc how the traditional approach examines the shuffling of the stored representations. We avoid the stored representation model (which we believe requires a homunculus to shuffle the mental representations). Instead, we attempt to speak of planning directly as a process, without resorting to assumptions that mental representations, stored in the head, are somehow combined or selected.

We are not arguing against mental representation as an activity. In fact, planning is a process that often involves representing one situation in terms of another, with or without material support. The acts of re-presenting ideas at another time and of transforming ideas to other forms are essential to human thinking. The use of material representations such as maps or schedules is a central feature of human cultural activity, and metal file boxes containing paper representations can usefully be seen as mental representations.

The point of our argument is to question the assumption that planning is an operation carried out on ***mental representations stored in the bruin.*** Models of planning that place explanatory strength on assumptions of cranial storage of mental representations seem to us to promote static views of cognitive processes that are assumed to be collected inside individuals' heads. We find it parsimonious to avoid the cranially stored representation assumption, because we are attempting to understand planning as a dynamic process involving individuals acting with others in sociocultural activity.

The issue of planning as a process versus the collection of stored plans is crucial to how we conceive of the development of planning skill. We first presenl a brief account based on the literature on the development of children's planning skill, and then describe the developmental activity approach, which we feel gives a better window to understand the development of planning.

III. Accounts of the Development of Children's Planning Skill

Planning has often been viewed as a general "higher-order" cognitive skill or ability, characteristic of an individual across varying problem situations. From this perspective, a "good planner" is able to solve problems with facility regardless of whether planning occurs in any number of different cognitive, academic, or interpersonal arenas. Developmental research is generally consistent

with this perspective, indicating that with age, children become more efficient and systematic in the generation of plans and more able to create and use a more extensive and varied repertoire of plans (Brown & DeLoache, 1978; Fabricius, 1988; Klahr, 1985; Oppenheimer, 1987; Scholnick & Friedman, 1987; Wellman, Fabricius, & Sophian, 1985).

Likewise, attempts to identify the developmental origin of infants' and children's planning skills are based on the assumption that planning involves acquisition of cranially stored representations. If planning skill is something to be possessed, and a person either has it or does not, the problem is to determine when children first acquire it.

However, research accounts vary widely in their identification of the age of origin of planning, ranging from infancy to adolescence (Kreitler & Kreitler, 1987). Some accounts identify different levels of planning sophistication applicable at different points in development, with associated difficulties regarding identifying the onset of each "stage." Piaget (1969, 1970) argued that children's ability to plan follows a qualitative evolution, with a child in the sensorimotor period engaging in rudimentary forms of planning, such as searching for a missing object behind a barricade or retrieving a hidden toy, a child in the concrete operational period beginning to anticipate solutions to concrete problems, and a child in the formal operational period exhibiting a more sophisticated form of planning by using metacognitive skills to develop abstract hypotheses and plans. Similarly, Vygotsky (1978) argued that planning undergoes transformation during development, with early forms of planning involving goal-directed and mediating activities that are not distinguished from the situation (referring to Köhler, 1927, who stated that in such planning the individual is "the slave of its own visual field") and more sophisticated planning allowing goal-directed and mediating activity to be performed in different contexts: Children "acquire an independence with respect to their concrete surroundings; they cease to act in the immediately given and evident space" (p. 28).

Given our perspective that planning is closely tailored to the circumstances, the goal shifts from trying to determine when planning ability or a particular stage of planning ability begins to describing the nature of the children's planning activity in terms of both the children's efforts and the circumstances. Such a shift abandons the competence-performance distinction (which assumes underlying stable "ability" that can in some ideal world be separated from the context) and substitutes for questions of what children "can" do an interest in understanding what children ***do.*** Our aim is to characterize transformations in children's approaches to planning activities, both through development across the years and across repeated attempts to solve similar problems. An interest in how planning develops during human activity inherently involves attention to individual, social, and historical levels of planning processes.

IV. Developmental Activity Approach

Our perspective is inspired by activity theory, based on the work of Vygotsky (1987) and Leont'ev (1981), which takes a genetic approach positing that developmental change occurs at several mutually related levels. In addition to transitions that occur across an individual's life (ontogenetic development), activity theory includes, as development, transformations in thinking that occur with successive attempts to solve a problem, even in time spans of minutes (microgenetic development, see Siegler & Crowley, 1991; Wertsch, 1979). And both ontogenetic development and microgenetic development are embedded in and in turn constitute the developmental processes involved in societal and phylogenetic change. Development within lives proceeds along with cultural and species development occurring over historical time (Scribner, 1985). Even solitary planning operates in social, cultural, and historical institutions.

Genetic approaches to planning have been employed in the study of a wide variety of phenomena by theorists such as Darwin, Engels, Hegel, Piaget, and Vygotsky. A genetic approach is based on the assumption that mental functioning can be understood by examining transitions in the phenomenon under investigation (Wertsch, 1991). A genetic approach to understanding planning differs from traditional approaches because it attempts to describe the evolution of planning within and across different genetic levels. The implication is not that one form of planning replaces another but rather that some aspects of planning are nested within others, mutually constituting each other. Vygotsky emphasized the interrelated roles of individual, social, historical, and evolutionary processes in his idea that microgenesis. ontogenesis, sociocultural change, and phylogenesis are developmental processes viewed in successively larger time frames (Scribncr. 1985; Wertsch, 1985a).

Planning is typically studied with a focus on one level (microgenesis, ontogenesis, sociohistorical development, phylogenesis); however, a complete understanding of planning would include an understanding of how developmental processes at each level fit with those at other levels. Most developmental studies of planning have focused on the ontogenetic level (e.g., Piaget's, 1969, observations of infants' attempts to reach a ball behind a barrier), with increasing attention being given to the microgenetic level (e.g., Hofsten & Ronnqvist, 1988, on anticipatory grasping; Benson, 1990, on crawling). Several accounts have focused on the sociohistorical level, such as Vygotsky's (1978) discussion of early forms of planning in sociohistorical evolution and research on planning during social interaction with adults and peers within cultural activities (Baker-Sennett et al., 1992). Considerations of planning at the phylogenetic level include Hegel's description of early planning in phylogenesis as "action carried out in another's service" (Kojeve, 1980, p. 42) and Köhler's (1927) seminal work with apes' use of tools to reach a banana.

The successful integration of these levels of analysis of planning is guided by the concepts of sociocultural activity theory (Gauvain, 1991; Laboratory of Comparative Human Cognition, 1983; Leont'ev, 1981; Rogoff, 1990; Vygotsky, 1987; Wertsch, 1981, 1985b), in which an individuals' efforts are seen as developing in the context of integral activities or events that involve the material and social world and their history and development. If we consider the activity or event as the unit of analysis, with active and dynamic contributions from individuals, their social partners, and historical traditions and materials and their transformations, we can think about the mutually defining roles of each.

Traditional perspectives on planning suggest that planning is an acquired skill that develops independently of or as a result of the *effects* of the environments in which planning takes place. In contrast with views that separate the individual and the environment (either to examine planning without regard to or as a result of the effects of the environment), we regard individuals and the environment as being inseparable-processes cannot be independently attributed to one or the other (Dewey & Bentley, 1949; Gibson, 1982; Leont'ev, 1981; Rogoff, 1982, in press; Vygotsky, 1987). Instead of studying a person's possession of a capacity or of a set of plans, our focus is on the transformations involved in an unfolding event or activity in which people participate singly or in groups.

In our activity approach, we conceive of time somewhat differently from the common conception in contemporary scholarship (Rogoff, in press). We consider events and activities to be inherently dynamic, rather than consisting of static conditions with time added to them as a separate element. Change and development, rather than static characteristics or elements, are basic. Time is an inherent aspect of events and is not divided into separate units of past, present, and future. Any event in the present is tied to previous events and directed toward goals that have not yet been accomplished. As such, the present contains past and future and cannot be separated from them. Pepper (1942) gave the example that the meaning of a word in a sentence ("the present") includes the previous uses of that word in other sentences and of other words already expressed in that sentence (the past in the present), as well as of the goal toward which the communication is proceeding (the future in the present).

When people act in the present on the basis of previous experience, their past is present. The past is not merely a stored memory called up in the present; it contributes to the event at hand by having prepared it. The present event is different from what it would have been if previous events had not occurred, but this fact does not require a storage model of past events.

Rogoff (in press) provided a physical example:

> **The size. shape, and strength of a child's leg at age 6 is a function of growth and use that has occurred previously; the child's leg has *changed* over development-it is not a summation of stored units of growth or of exercise. The past is not *stored* in the leg;**

the leg has developed, changed to be as it is currently. There is no need to separate past and present or future, or to conceive of the development in terms of the acquisition of stored units. Development is clearly a process spanning time, dynamic, with change throughout rather than accumulation of new items.

Similar examples could be drawn from social processes of change; for example. the development of an organization is conceived of as change, not as an accumulation of stored units of some sort.

Not only is the past present, but the future is also present in each moment. Children's physical growth, and human activity in general, moves in particular directions. Little doubt exists when a child is 6 as to what shape and utility his or her legs (a better example might be the child's gonads) will have 20 years in the future. Likewise, human planning, communication, work, and play all contain within the present some general directions or purposes toward which the participants are going. For example, children planning dialogue for a play work with the general theme and aims of the performance as they manage specific wording decisions of the moment. Goals or purposes need not be tightly formulated (and certainly do not need to be subject to reflection) to guide present action. Thus, we emphasize that planning occurs in the service of accomplishing things in the future, and cannot be dissected from goals to be accomplished nor from the history of the activity.

V. Planning: Deliberate Efforts to Reach Goals

We consider planning to be a process involving interpersonal and practical goals and means, addressed deliberately (but not necessarily consciously or rationally), with flexible improvisation to reach the goals. In this section, we first examine three key features in our definition of planning: (1) orientation toward reaching a goal, (2) deliberateness of efforts to get beyond problems in reaching the goal, and (3) use of mediating efforts to reach the goal. We then discuss how the focus of attention in planning shifts with development, so that aspects of an activity that once required deliberate, goal-directed attention become automatized and nested within larger systems of activity. This leads, in the next section. to our argument that skilled planning involves flexibility of planning in advance of and during action to anticipate upcoming opportunities and constraints and to adapt to changing circumstances.

A. GOAL ORIENTATION, DELIBERATENESS. AND MEDIATING MEANS

Goal orientation, deliberate efforts, and use of mediating means to reach goals are not independent: Deliberate efforts provide evidence that a person is oriented toward reaching a goal; inferences regarding the goal inform an observer's understanding of the person's deliberate efforts to get past difficulties; and mediating actions provide evidence of deliberateness. In linking these criteria together, we are using a conservative definition of planning. It goes beyond observing that an individual is goal directed, and requires also observing that the individual adjusts means to reach goals in a deliberate and mediated fashion.

Mead (1956) suggested that goals can be attributed to individuals if evidence indicates an interaction between two different actions carried out sequentially: The first action serves to adjust the environment for the second action. For example, we cannot infer goal-directed behavior when we watch someone sit down on a chair because this action could have been accomplished automatically; however, we can infer goal-directed activity when we observe the individual first pick up a cloth and clean bread crumbs off the surface of the chair and then sit down. In this case, the action involves an indirect means ("mediating means") to the goal of sitting on a clean chair.

In mediating means, the individual performs an action that is not directly oriented toward the goal but is an indirect attempt to reach the goal. Using a stick to retrieve a banana, going around a barrier, and using gestures all serve as mediating activities. Mediating activity introduces a new route for activity that involves a detour from the direct route of goal-directed behavior.

Köhler's (1927) experiments with apes provide a useful illustration of mediating activity. If after a few attempts to reach a banana, the ape jumped and reached the banana, planning would not have been involved because the ape obtained the banana through the nonmediated, direct action ofjumping. This activity was goal directed and perhaps deliberate, but we would not consider it to involve planning. Planning occurred when Köhler's ape, after failing in his attempts to adjust his jumps to retrieve the fruit, suspended his efforts to reach the fruit directly and instead looked around and saw a stick, suddenly grasped the stick, and obtained the fruit. Here, the stick served as a mediational tool to achieve the goal of retrieving the banana.

Mediation can take many forms (Hegel, 1975). Mediation may occur without the use of tools, as in Piaget's (1969) observation of infants' retrieval of a ball from behind a barrier, Mediation may also involve the use of tools, as was the case in Köhler's (1927) experiments with apes. Mediation might also involve the use of other persons as tools, as when infants use their mothers to get access to or help with a toy (Mosier & Rogoff, 1990). It may also involve the production of tools, such as tools for planning itself (e.g., maps or lists or verbally sketched plans). In all these examples, planning emerges as a response to the specific problem-solving situation, and mediated action involves a detour from goal-directed activity.

In planning, mediated means to reach a goal *are deliberate,* not accidental or automatic. We have been aided by Bruner's (1981) definition of intention, sug-

gesting that persistence and correction (adjustment) of means to get closer to an end state are basic elements of intentional, planful action. Thus, by deliberate efforts we mean efforts that give evidence of flexible and purposeful mediation of means to achieve a goal.

The term deliberate was chosen to allow discussion of planning that gives evidence of orientation toward a goal with flexible means to achieve it, without having to be concerned with hoary issues of consciousness or awareness. Deliberate activity, in our view, can occur in a strategic fashion with or without a person being able to report on the activity or its reasons, and without the person reflecting on the alternatives. The difficulty with the criterion of awareness is that it generally means being able to report on one's activities, which to our view is just another activity-that of communication. On many occasions, introspection convinces us that we have planned, even if we are not able to explain our deliberations to ourselves and much less to another person. Thus, we emphasize that planning involves deliberate, flexible action mediating attempts to reach a goal.

B. THE DEVELOPING FOCUS OF PLANNING: AUTOMATIZATION

Definitions of planning may suggest easy categorization of one type of activity as being planned and another not; however, with any process, the nature of the phenomenon changes as the process develops. Hence, the developmental nature of the process must be taken into account when planning is observed. The focus of planning itself develops, with some processes becoming nested in others, thereby addressing the classic issue of automatization: Any activity can require deliberateness or can be carried out automatically, depending on how it fits with the goal, how complicated the circumstances are, and how skilled the planner is.

Even very complex sequences of action can become automatized. An individual living in a dusty environment might automatically use her apron to dust off a chair whenever she sits, and the same actions that we could consider goal directed would seem automatic. The issue is not the complexity of the actions but how they fit together and whether the person deliberately and flexibly adjusted the actions to get past difficulties in reaching a goal.

Our focus on planning as process draws closer attention to the ways in which people decide to handle a situation rather than focusing on the complexity of the outcome. Indeed, conceiving of planning as the accomplishment of complex outcomes or of plans as products may introduce a certain mindlessness in planners as well as researchers studying planning. Langer (1989) argues that "a preoccupation with outcome can make us mindless" (p. 75); conversely, "mindfulness" is associated with process. Langer provides the following example:

> One day a woman was about to cook a roast. Before putting it in the pot she cut off a small slice. When asked why she did this she paused, became a little embarrassed, and said she did it because her mother had always done the same thing when she cooked a roast. Her own curiosity aroused, she telephoned her mother to ask why she always cut off a little slice before cooking her roast. The mother's answer was the same; "Because that's the way my mother did it." Finally, in need of a more helpful answer, she asked *her* grandmother *why* she always cut off a little slice before cooking a roast. Without hesitating, her grandmother replied, "Because that's the only way it would fit in my pot." (1989, pp. 43-44)

Thus it is essential in the study (and the practice) of planning to attend to the nature of decision making rather than focusing on plans as products.

1. *Nesting of Levels of Planning*

Planning by nature involves nested actions that are themselves automatic. Automatization of actions that can be chunked together to serve higher-order goals is a developmental process. As people become skilled in a particular activity, they typically automatize aspects of the activity that formerly required direct attention (Bjorklund & Jacobs, 1985; Brown & Carr, 1989; Stanovich, 1990; Stemberg, 1985). This automatization allows them to chunk aspects of the activity as they gain facility and to turn attention to fitting the chunks together. One would no longer consider the automatized aspects of the activity to be planful; rather, the planning would appear to be focused on fitting together the chunks and adjusting them to the higher-level goals. Through development in any domain, and ontogenesis in general, the focus of attention and planning moves to the aspects of the process to which the individual needs to devote attention to proceed. For example, adults getting out of chairs may not need to plan the descent, even from large chairs, but toddlers can be seen deliberating on whether to lean forward and slide out or to turn around in a chair and take a backward approach to getting their feet to the floor. Of course, some circumstances may require attention to an aspect of the activity that ordinarily requires little attention.

Leont'ev (1981) described the nested relationship between automatized and planful instrumental action. Automatized instrumental action can serve as the means for planful instrumental action, and an instrumental action that can on some occasions be automatic can on other occasions be planful. Rogoff, Gauvain, and Gardner (1987) gave an example of the dialectics of automatized instrumental action that becomes planful, and planful instrumental action:

> The process of reading a book may or may not be planful. If a child has acquired expertise in reading, processing of the text proceeds automatically to a high degree. But if the child is reading the book to study for an examination, he or she may be planful in searching through the index and table of contents, and pausing to formulate an answer to a potential test question. (pp. 304–305)

2. *Leont'ev's Thee Levels of Activity*

Leont'ev (198 I) explicated three interrelated levels in the analysis of activity. which we find useful in considering planning as a phenomenon in which actions are nested within goal-oriented activity, which in turn serve other goals. Leont'ev's global level of analysis is the unit of the ***activity.*** Activity inherently involves motive, or driving force, which is socioculturally structured (e.g., play. schooling, and work activities). Leont'ev's second level of analysis is the unit of ***goal-directed action.***

> The basic "components" of various human activities arc the *actions* that translate them into reality. Wc call a process an action when it is subordinated lo the idea ol achieving a result. Let us take the case of a human being's activity that is motivated by food. The food is the motive. However, in order to satisfy his/her need for food, he/she must carry out actions that *are* not *immediately* directed toward obtaining food. For example, his/her goal may be to make a tool for hunting. . If we mentally tried io abstract actions from the activity that they translate into reality. nothing would remain. (1981, pp. 59–61)

Activity and goal-directed action are different levels of analysis because involvement in a particular activity can be independent of specific actions. The same action can serve very different activities, and different actions can serve the same activity. Leont'ev further specified that any well-developed activity involves a series of subgoals (i.e., goal-directed actions) that lit together to achieve the overall goal.

Leont'ev's third level of analysis 'is the unit of ***operations.*** Operations are the means by which actions are carried out, how the action is done, which is defined by the circumstances in which the goal is carried out. Actions are concerned with goals, and operations are concerned with conditions. Different operations can be substituted to achieve the same goal-directed action, and the same operations can serve different goal-directed actions.

> The origin of an action is to be found in relationships among activities, whereas every operation is the result of the transformation of an action. This transformation *occurs* as a result of the inclusion of one action in another and its ensuing "technicalixation." A very simple illustration of this process is the formation of the operations required, for example, in driving an automobile. Initially, every operation-for example. shifting gears—appears as an action subordinated to a goal. . . Subsequently, this action is included in another complex action, such as that of changing the speed of the automobile. At this point, shifting gears becomes one of the methods for carrying out this action-that is, it becomes an operation necessary for performing the action. It is no longer carried out as a special goal-directed process. The driver does not distinguish its goal. So far as the driver's conscious processes are concerned. it is as if shifting gears under normal circumstances does not exist. He/she is doing something else: He/she is driving the automobile from place to place, driving up steep inclines and across level expanses, bringing it to a stop in certain places. etc. Indeed, we know that this operation can "drop out" of the driver's activity entirely and can be performed automatically. It is generally the fate of operations that, sooner or later, they become a function of a machine. (Leont'ev. 1981. p. 64)

These nested levels of analysis allow for the integration of sociocultural situations with individual mental functioning. Leont'ev argued that "***systematic*** analysis of human activity is also, of necessity, analysis by ***levels.*** It is precisely such an analysis that allows us to overcome the opposition of social, psychological, and physiological phenomena, and the reduction of one to another" (1981, p. 69). Hence, the study of planning involves considering the integration of processes occurring at levels that have frequently been seen as working separately or even as being competitors for judgments of being most crucial (as in the classic question of nature versus nurture). Later in this article, we argue for the integration of institutional, interpersonal, and individual levels in the study of children's planning. An emphasis on developmental processes integrated across various levels of activity brings the importance of flexibility in planning to the forefront of examinations of skilled planning.

VI. Flexibility in Planning: Synthesis of Advance Planning and Improvisation

Researchers have generally characterized more mature planning as involving more frequent planning in advance of action (Brown & DeLoache, 1978; Forbes & Greenberg, 1982; Klahr, 1978; Magkaev, 1977; Rogoff, Newcombe, & Kagan, 1974); however, Rogoff et al. (1987) suggested that the use of flexible planning is at least as important a development as skill in advance planning.

Pea and Hawkins (1987) found that 8- to 12-year-old children did not seem to "step back" to consider the planning process during the construction of a plan in their chore-scheduling task, and suggested that children may not be capable of knowing when to plan in advance and when to plan during action (though they pointed out that their task may have been simple enough not to require reflection).

A study by Gardner and Rogoff (1990) suggested that development of planning skills entails knowing when to plan in advance and when to plan during the course of action. Gardner and Rogoff found that older children (7 to IO years old) were more likely to adapt their planning strategies to specific task circumstances than were younger children (4 to 7 years old). When no time pressure was imposed and avoidance of errors was emphasized, older children planned more in advance by determining the entire route through the maze before acting; but when speed as well as accuracy was emphasized, children of both ages planned more during action and the older children used somewhat less advance planning than did the younger children. Thus, both older and younger children adapted their strategies to the circumstances, but younger children did not fit their use of advance planning to the problem to the degree that older children did.

The importance of improvisation and flexibility in planning has been emphasized by several scholars, including Dewey (1916; see epigraph at the beginning

of this article) and Miller, Galanter, and Pribram (1960), who noted that the search for problem solutions often proceeds through a process of generating best guesses rather than searching systematically and exhaustively for the final solution in advance of acting.

Leont'ev (198 1) extended the importance of flexibility to include the development of goals: "Selection and conscious perception of goals are by no means automatic or instantaneous acts. Rather. they are a relatively long process of *testing* goals *through action* and, so to speak, fleshing them out. As Hegel correctly noted, an individual 'cannot define the goal of his action until he has acted' " (p. 62). Planning is not only a process of reaching goals through planful scqucnccs of actions but also a process of forming the goals thcmsclvcs. Discord in a planful sequence of actions can derive both from unanticipated circumstances, which require adaptation in the face of obstacles, and from vagueness and contradiction in intention, which require modification or elaboration of goals.

An example of these two aspects of flexibility appears in the writing of compositions. While writing a composition, a person might have an abbreviated goal in the form of a topic that serves as the starting point for a planful sequence of actions, but the person may encounter two types of discord that require flexibility. Struggling with the wording to state the topic requires flexibility in the adjustment of means to the circumstances (e.g., the surrounding sentences) Incompatibilities in the arguments advanced or in covert aspects of the topic that crystallize as the author works require flexibility in clarifying the goals of the composition. In these ways, skilled planning in writing requires flexibility both in the means to reach the goals and in the goals themselves.

Hayes-Roth and Hayes-Roth's (1979) model of "opportunistic planning" suggests that people make tentative decisions about an overall plan. Each decision need not fit into a completely integrated plan. As planners incorporate new decisions into specific subsets of previous decisions, plans develop. Opportunistic planning allows planners to break a general plan into subplans and to pursue, elaborate, or abolish these partial plans in a flexible fashion during the course of action. Thus, an important aspect of planning involves flexibly synthesizing advance planning and planning during action. Skilled planning involves knowing when to plan in advance and when to defer decision making (Stefik. 1981).

> In planning a route through familiar terrain. we may not develop a mental map resembling a bird's-eye view of the projected route. . . Rather than thinking out the whole route as we begin. we may think of the goal and establish an appropriate intermediate plan, relying on remembering or figuring out the rest of the route as we go. (Rogoff et al.. 1987. p. 308)

Opportunistic planning involves a flexible combination of advance planning and improvisation, developing skeleton plans to be elaborated in various degrees

during action. There are some advantages to planning in advance of action. Placing one's emphasis on advance planning may simplify tasks by limiting and organizing options and promoting systematic consideration of the relative advantages of the options, which may aid in solving some types of problems, particularly those that place severe limitations on both the process and the final product. Advance planning allows verification that all the components of a plan are in place before acting, to avoid costly errors when a problem presents sufficient lime to plan in advance but limited time or physical or mental resources at the time the plan needs to be carried out (Rogoff et al.. 1987). When planning involves collaboration with other people in advance of acting, advance planning may ensure successful coordination of efforts.

In many circumstances, however, advance planning is unnecessary, inefficient, or impossible (Goodnow, 1987; Rosaldo, 1989). Because not all outcomes of planning decisions can be foreseen, choosing to leave some decisions open allows greater flexibility in changing circumstances (Gardner & Rogoff, 1990; Kogoff et al., 1987). Improvisation allows a planner to take advantage of circumstances and to avoid mental effort and delays required to formulate an advance plan, especially when the problem can be handled by a variety of solutions rather than a unique best solution. Planning in action enables adjustment to *new* information while proceeding with the plan (Randall. 1987). Rosaldo pointed out that "in everyday life the wise guide themselves as often by waiting to see how events unfold as by plans and predictions (1989, p. 92)." Goodnow (1987) pointed out that advance planning is not always socially acceptable and may even have negative consequences as in friendships, marriage. and family situations in which the members of a group need to coordinate and modify individual plans to accommodate the interests of both individuals and the group.

Improvisation is not limited to reacting to the circumstances, but also involves preparing to be flexible and to take advantage of events that are as yet unknown for the development of both means and goals. It involves a flexible attitude that takes advantage of as-yet-undetermined opportunities for creative handling of problems; it does not simply defer decision making in case things go wrong. Improvisation includes anticipation, flexibility of means to achieve a goal, revision or elaboration of goals, and alertness to new opportunities and changing circumstances.

An example is a jazz musician's or comedian's attempt to alter or elaborate a plan creatively during the course of a public performance (Dean, 1989; Johnson-Laird, 1989; Sacks, 1989). The jazz musician works from a basic musical plan that is elaborated in an improvisational fashion during the performance. Each musician must coordinate his or her performance with the other musicians in the band to fashion a product. The comedian needs to alter initial plans while monitoring the audience's reaction to such factors as presentation style, speed of delivery, specific word content, and particular topics (Sacks, 1989). Both entertainers follow a sketch of an advance plan, with much of the plan extemporane-

ously modified and elaborated during the course of the performance (Johnson-Laird, 1989). These examples suggest that planning is an active, dynamic process that involves developing a preliminary plan that is flexibly and creatively modified and adapted in the light of how the event proceeds.

As Nuttin (1984) pointed out, the realities of everyday problem solving often necessitate flexible planning:

> Planning and action often go hand in hand inspiring and correcting each other. Important goals and plans usually take shape in the course of action and are processed only gradually. Take a plan for following a career, building a house, getting married, promoted, etc. It may take months and even years for the plan to mature. The process may be compared to the manner in which a general theoretical problem is operationalized. Situational factors and learned experience play a major role along with creative thinking and imagination. (p. 157)

A study of how Girl Scouts plan routes for selling and delivering cookies during their annual fund-raising activity showed the necessity of an improvisational approach (Rogoff, Lacasa, Baker-Sennett, &Goldsmith, 1992). If the girls tried to plan the whole route in advance, their effectiveness in selling and delivering cookies would suffer. For example, one girl began her delivery by separating her customers' orders, marking each with a Post-it note indicating address and amount due, and then lining up all the customers according to their addresses, creating an efficient route around her neighborhood. She lined up dozens of groups of orders on the sidewalk in front of her house, asked for information regarding which address would be closest to which other, and then stacked the linear array in reverse order in a wagon (to have the beginning of the route on top). This approach looked very sophisticated until the scout began the delivery and soon found the need to improvise, because some customers were not home, companions needed to go to the bathroom, and so *on. In* subsequent deliveries, this scout (like many others) used a more flexible strategy: she chose a small number of orders to deliver in the same rough area and adjusted delivery according to what occurred during delivery. This plan meant that some backtracking of routes was anticipated; however, if the need for backtracking had not been anticipated, it still would have been necessary because of the impossibility of anticipating all aspects of the delivery.

In the rest of this section, we provide in greater depth two further illustrations of the importance of flexibility during planning, combining planning in advance with improvising: using research on planning written discourse and on designing plays. A subtheme in both of these examples, as in the example with Girl Scout route planning, is that the importance of flexibility of planning is especially notable when planning is viewed as a sociocultural activity occurring with other people in particular events that involve cultural organization and the USC of cultural tools. Following the discussion of flexibility in planning written discourse and in designing plays, we conclude the article with a discussion of levels of analysis of planning as a sociocultural activity.

A. FLEXIBILITY IN PLANNING WRITTEN DISCOURSE

Skilled writing involves planning both in advance and during the course of writing. During extensive revisions of early drafts, expert writers transform existing information to produce new ideas (Flower, 1989). Written discourse can involve global planning and sophisticated methods of improvisational planning. Skilled writers' plan opportunistically, creating plans both in advance and during the course of action (Bereiter & Scardamalia, 1987; Burtis, Bereiter, Scardamalia, & Tetroe, 1983; Flower, 1989). In interviews, skilled writers state that they view writing as a process of discovery. Much of the process is not preplanned. In fact, expert writers often comment on how surprised they are by the products that result from their own endeavors (Wason, 1980).

> An intriguing idea or a *bon mot* floats into view and the writer goes running after it, happily revamping her plan to embrace this unexpected possibility. The presence of opportunism and serendipity reminds us that planning rarely seems to follow the tidy, top-down procedure promised by some textbooks (e.g.. choose a subject, limit your topic, select relevant ideas). However, this does not mean that the planning process is unstructured-even if the writer does not consciously control the structure. (Flower & Higgins, 1990, p. 6)

> [Expert] writers move back and forth between potential content and more abstract representations. Experts think with goals. plans, gists, and paraphrases. These more abstract blueprints for text are easier to think with and easier to throw away. Like meta-knowledge about one's own process, they give the writer more flexibility and control. (Flower, 1989. p. 205).

The use of flexible strategies results in discoveries during the course of writing. In turn, these discoveries lead to revisions in generated text (Hayes & Flower, 1980).

When elementary school children are compared with skilled writers, they appear to be poor planners. Not only do they have difficulty generating plans (Englert, Stewart, & Hiebert, 1988), they also engage in relatively little spontaneous revision of their own written work (Daiute & Kruidenier, 1985). Children's written discourse typically consists of the written production of what they know about a particular topic, and their planning strategy involves deciding what to write next (Bereiter & Scardamalia, 1987). Expert writers, in contrast, construct and transform knowledge both during and prior to writing, with a good deal of planning before and during writing. Bereiter and Scardamalia reported that children as old as 14 spend only 10% of their time engaged in conceptual planning. The rest of their time is spent deciding what to write next. When asked

specifically to plan, children still simply list content information, much as they do in their written productions (Bereiter & Scardamalia, 1987; Durst, 1987; Emig, 1977; Flower & Higgins, 1990; Graves, 1975; Hidi & Hildyard, 1983; Langer, 1984, 1986).

One might conclude from this discussion that children are not capable of global planning of discourse. However, Bereiter and Scardamalia (1987) observed sophisticated planning during informal observations of a group of sixth graders (11- and 12-year-olds) who spent an entire 40-minute session planning a story-constructing alternative plans, motivations for characters, and audience reactions. Also, Baker-Sennett et al., (1992) found that when planning a play. second- and third-grade children (aged 7 to 9 years) engaged in quite sophisticated planning. Students' written plans included the establishment of higher-order goals and subgoals, abbreviated scripts, and lists of tasks to be performed.

Children may engage in global planning more when collaborating than when working alone. The integration of individual plans to generate a group product requires articulation of the plans, which may facilitate planning as the public version clarifies conflicts and helps writers avoid becoming lost in low-level text (Daiute & Kruidenier, 1985; Graves, 1983). Higgins, Flower, and Petraglia (1990) suggested that reflection facilitates the quality of children's planning, and that in some cases children are more likely to engage in reflection when they work together on collaborative writing. Collaboration may provide children with the need as well as the means to engage in strategies that involve more sophisticated planning than is called for in individual writing. Indeed, some empirical evidence suggests that children can but usually do not (unless prompted) plan written discourse in a transformational and constructive fashion (Flower & Higgins, 1990).

B. FLEXIBILITY IN DESIGNING PLAYS

In an examination of advance and improvisational planning, Baker-Sennett et al. (in press) investigated childrens' planning during the creation of a classroom play. A group of six second- and third-grade girls (aged 7 to 9 years), with intermittent assistance from their teacher, collaborated-on the planning and production of their version of the fairytale Snow *White* over the course of 10 half-hour sessions.

Over the course of planning, the girls worked in five levels of planning, ranging from considering such metacognitive issues as deciding how to plan the planning process to more concrete and detailed decision making about specific words and actions. The girls spent a good deal of time during the early sessions considering many of the metaplanning issues that would form the foundation for their later concrete planning decisions. They considered alternatives for deciding how to go about planning the play and discussed how to develop strategies and

procedures for handling disputes during the planning process. During these early sessions they spent time deciding on the main theme and events of the play and on how to divide and distribute roles. The planning regarding managing social interaction was central to the planning of the play itself, for the effort to resolve disputes evoked some of the most creative planning of the play. The girls also used cultural and institutional supports for their planning. attempting to build on their imperfectly shared understanding of the structure of fairy tales (and of this particular tale), as well as using classroom procedures and resources for managing the process.

Throughout the early sessions the girls spent most of their time planning in advance "out of action"; however. from the fourth session, the group spent more time improvising and modifying preplanned actions, dialogue, and scenes, thereby creating new plans during the course of action. Because the problem was open-ended and not all outcomes of planning decisions could be foreseen, the group's decision to leave some aspects of the plan open to development during action allowed for flexibility and creativity, as well as being the only way that a group of strong-minded individuals could move forward in developing the plan on a cooperative basis.

During the early sessions the group built a "social foundation" that allowed them to work effectively as a group as well as to meet the cognitive challenges of their task. This social foundation was built through verbal communication and explicitly stated plans. Once this social foundation for planning was built, the group was able to plan in an abbreviated fashion because the foundation involved both procedures for making decisions and sketches of the general plan of the play. Further planning was less explicitly stated; rather, the group planned largely "in action," in the characters and scenes that they were developing, with some management of the process to bring it to a more general level when too much time was spent on detail. The collaborative process necessitated explicit planning and, furthermore, necessitated improvisation to allow cooperation among group members and to take advantage of creative opportunities offered by the group process. The social process constituted the planning of the play; the planning of the play *was* social process.

VII. The Social and Cultural Nature of Planning

The preceding example illustrates the idea that the planning process is inextricably woven into the fabric of social and cultural activity. The importance of flexibility in planning is easily seen when planning processes are not viewed as independent of the cultural and social processes in which they are embedded. In everyday life. planning occurs in culturally organized institutions and social situations in which individuals work with others to prepare for and carry out joint

action, often necessitating adjustments in planning to fit with the social distribution of both the planning and the execution of the plan.

A sociocultural approach to planning emphasizes the social structure of intellectual activity (e.g., in school or work or family activities) as well as the cultural tools used in problem solving. It entails recognition that planning involves use of cultural tools such as maps, pencils, and linguistic and mathematical systems, as well as cultural values and situational constraints and resources influencing what means are valued for solving problems (e.g., improvisation or planning all moves in advance of action). A sociocultural view entails the definition of a problem as having cultural origins with ties to institutions and value systems. Even the planning of solutions for imaginary problems in laboratory scttinga occurs in a sociocultural context.

Differences in the errand-planning approaches of Australian adolescents and housewives studied by Lawrence, Dodds, and Volet (cited in Goodnow, 1987) illustrate the importance of social definitions of planning problems. Housewives planned errands more efficiently than adolescents, not only because of the housewives' greater experience with planning and running errands, but also because of the adolescents' view that when running an errand in town socializing and "hanging out" were just as important as completing the task in a timely fashion. Likewise, cultural variation in reliance on clocks and schedules often involves differences in priorities regarding task efficiency or the emergence of activities from group readiness.

Individual cognitive skills develop in the context of practical action as children interact with others who assist them in extending their skills, functioning within existing institutions, and using tools for thinking developed over history. Vygotsky (1978) suggested that individual cognitive development can best be understood by viewing it as embedded in a sociocultural context that provides tools for thinking (such as mnemonic devices, systems of literacy, and mathematics), partners who are skilled in the use of such societal tools for thinking, and participation in sociocultural activity.

Extending Vygotsky's ideas, Rogoff (1990, in press) emphasized the mutuality of children's and their partners' roles in creatively handling joint problem solving, the routine and tacit nature of everyday collaboration in problem solving, and the systems nature of children's participation in organized social activity involving other people varying in skills. The participants both constitute and are constituted by their engagement in valued cultural activities in communities with traditions and practices that they inherit and transform.

In this section, we discuss the interpersonal context of children's planning, the institutional context in which children's planning is embedded and which children's planning helps constitute, and the cultural tools that people use and develop to facilitate planning.

A. THE INTERPERSONAL CONTEXT OF PLANNING

Research suggests that when children share problem-solving decisions with others, their skill in handling the problem may advance more than when they work alone. Three-year-old children who planned pretend shopping trips adjusted individual plans to fit their peer partners' plans after they experienced difficulty in coordinating plans with their partners (Gearhart, 1979). Children working in teams on a Tower of Hanoi task yielded better problem solving than did children working alone, but only when the children were forced to make joint decisions (Glachar: & Light, 1982). Pairs of 5-year-old children who developed routes to pick up grocery items without backtracking through a model store planned more efficiently and with more foresight, both during collaboration and subsequently, only if they shared in decision making with their peer or adult partners (Gauvain & Rogoff, 1989).

Other studies suggest that some salient features within the adult-child relationship may facilitate children's profiting from collaboration in planning with adults. In a study of IO-year-old children's collaboration with adults or peers in imaginary errand planning, Radziszewska and Rogoff (1988) found that working with adult partners involved both guidance and participation, each of which appeared to facilitate children's later solitary imaginary errand planning. The collaborative planning of adult-child dyads was more sophisticated and efficient than that of peer dyads, who generally focused on one decision at a time, simply identifying the destination closest to the current location. Adult-child dyads planned longer sequences of moves, were twice as likely to explore the layout before making moves (often marking the choice and no-choice destinations with different colors and symbols to facilitate planning), and were far more likely to state planning strategies explicitly. During collaboration with adults, children usually participated in the sophisticated strategies organized by the adults. Though statements of strategy and thinking aloud of decisions came primarily from adults, children participated in managing the sophisticated decisions. In a replication in which peers were trained in the imaginary errand-planning task prior to collaboration, children who worked with adults were still more likely to receive more guidance, to participate, and to produce more efficient plans than those who worked with peers (Radziszewska & Rogoff, 1991).

The children who produced the most efficient routes in subsequent solitary errand planning were those who had participated in skilled planning decisions, with guidance. They gave evidence of appropriating the mediational means developed in their interactions with adults (Rogoff, in press), making use of the tools for planhing that were developed in collaboration. In the collaborative trials, adult partners frequently invented ways of marking the lists of errands to facilitate distinguishing the destinations that they were required to visit from

those for which they had to choose one of two alternatives. Using such markings, they could base their route on the obligatory destinations and then decide which alternative other destination was closer. During subsequent solitary trials, almost all the children from adult-child pairs started the individual trial by searching for and marking the choice and no-choice stores on the map in ways resembling those invented in their interaction with the adults, but almost none of the children from peer dyads distinguished the stores in advance of making moves. These results point to the importance of the use of cultural tools. The creation of a system for distinguishing the stores provided the children with a means of handling a planning problem in a more sophisticated fashion than they used when working only with other children who did not create such a tool for planning. Such tools are an aspect of the sociocultural institutions in which social interaction and individual problem solving occur.

B. THE SOCIOCULTURAL INSTITUTIONS OF PLANNING

Although these studies point to the importance of certain types of social relations as facilitators of planning, the sociocultural context of planning includes more than interpersonal relations. Children's planning occurs in the context of historical, cultural, and economic institutions and practices, which in turn are constituted by the activities of individuals and groups. Few investigations of cognitive development have focused on the sociocultural conditions in which children create and work on problem-solving goals or on how the activities of individuals themselves constitute and transform sociocultural institutions and practices.

Because most research on planning occurs in situations that are devised by the researchers, the sociocultural context of the planning activity is seldom noticed. as it is embedded within research and educational institutions that surround the investigators. Systems in which one is completely immersed are difficult even to detect. Analysis of the sociocultural context of social and individual activity is difficult for researchers embedded in educational situations or research traditions that are often seen as the way things must be rather than just one way that things happen to be. In a planning activity controlled by a researcher, the researcher may fail to notice that the participants are constrained in the problem definition, the appropriate means of solution. and the material supports and constraints provided by the researcher (Rogoff et al., 1992). The participants cannot redefine the problem or its appropriate solution without going out of the bounds of the social contract between "subject" and "experimenter."

To examine the sociocultural context of children's planning, Rogoff et al. (1992) chose an activity that was not devised by researchers, hoping to be able to focus on the interrelations of the personal, interpersonal, and institutional levels of planning in an activity in which these levels are not taken for granted, as is usually the case in research on planning. They studied a widespread nonlaboratory errand-planning activity, working as participant observers with lo-year-old Girl Scouts who were selling and delivering Girl Scout Cookies as part of their annual fund drive.

The individual girls carried a great deal of responsibility for planning routes. keeping track of sales, cookies, and money, and managing their time, in the context of collaboration with other scouts, siblings, parents. customers, and adult troop leaders. Many of the other children and adults had been involved in sales before, and therefore multiple sources of information and assistance were available to the individual girls. Further, the collective experience of planning cookie sales is carried forward in the cultural context of institutional suppons and constraints provided by traditions and practices of the Girl Scout organization, which provides training to troop leaders and many organizational supports to the individual girls. For example, the cookie order form is color coded in a way that facilitates keeping track of the different kinds of cookies, with organization and information to facilitate the calculation of amounts of money, the information to be presented to customers, and the keeping track of key dates. The girls collaborated with and competed with their peers, they guided and were guided by peers and adults, and they worked within and modified traditions and institutional constraints and supports.

Focusing on the sociocultural nature of the Scouts' planning drew attention to the centrality of flexibility in the planning of routes; the interpersonal relations involved in planning with other scouts, siblings and parents, troop leaders, and customers; the institutional constraints and assistance of planning; and the tools for planning provided by the institution and used and transformed by the girls.

C. CULTURAL TOOLS FOR PLANNING

The tools used in planning have often been overlooked as an aspect of the planning process when planning is defined narrowly as a process occurring within an individual's head. Within a sociocultural activity approach, the tools used by people to facilitate their planning become a key aspect of understanding the planning process.

> An adequate conceptual model of planning needs to recognize that planning is not encapsulated within the head of the planner. Even when planning occurs out of the context of action, it often relies upon simulations of aspects of the activity, with maps, lists, or simulations of sequences of events using written, spoken, or drawn symbols as in blueprints, thumbnail sketches. or battle plans. And in planning during action, a planner uses the resources and constraints of the environment in the process of generating and carrying out the plan, again using external aids such as lists, reminders, and the assistance of others. (Rogoff et al.. 1987. pp. 306–307)

These material and social constraints and supports are not just accidentally available; they are organized in social institutions and practices having to do with economic, academic, political, and other systems and their associated tools and systems of values regarding what is to be done and how it is best achieved (Rogoff et al., 1992). Vygotsky focused on the mediational system developed over human history that plays such a key role in human relations and cognition—the sign system of language (1983, p. 143). Spoken, written, and signed language, calendars, maps, and many other cultural artifacts inherited from others and further developed by each generation are central to planning by human individuals and groups. They are a special instance of mediating means for planning that do not simply aid people in finding indirect routes to goals, but also provide opportunities for indirect exploration of plans through simulation of various sorts. Hence, in considering the sociocultural nature of planning one must examine how planning involves individuals working within and contributing to the constraints and opportunities provided by other people, by sociocultural institutions, and by cultural tools for planning.

VIII. Conclusions

In this article we have argued that planning is a developmental process at various levels, among them the development of skill in a particular activity, the development of individuals across time, the development of interpersonal relations. and the development of cultural institutions and tools related to planning. Each of these levels needs to be considered with the others to arrive at a more complete understanding of the development of planning at any one level.

According to this sociocultural approach, planning is a process of deliberate transformation of mediating means to reach goals and of development of the goals of activity in the course of events. Over development, the focus of attention shifts so that aspects of an activity that once required deliberation become nested within larger systems of activity.

Our aim in this article was to describe how a developmental activity approach allows researchers to investigate how planning occurs in activities involving people interacting with each other, contributing to and working with sociocultural institutions, practices, and values. This perspective allows us to view planning not as a process that is either present or absent, nor as an isolated element of human cognition, but rather as an inherent part of human activity. When activity becomes the unit of analysis, a conceptual shift in the way we think about such issues as the nature of time, change, and purpose occurs in both theory and methodology. This approach moves us away from traditional perspectives that examine age-based comparisons within individuals. Rather, a developmental activity approach allows us to examine the range of roles and responsibilities that children take in activities and how their participation evolves over time.

A sociocultural activity approach directs scholarly attention to the centrality of flexibility in planning, as people improvise flexibly, combining planning in advance of action as well as planning during the course of action. In this way, people take advantage of new aspects of developing events and adjust to unforeseen circumstances to plan in the context of activities occurring in actual material circumstances, with other people, engaged in activities based on and contributing to sociqcultural practices and institutions with associated values and tools relevant to planning.

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