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Explanations of Cognitive Development Through Social Interaction: Vygotsky and Piaget

When I discuss and I sincerely seek to understand someone else, I become engaged, not just in avoiding contradicting myself, in avoiding playing on words, etc., but also in entering into an indefinite series of viewpoints other than my own. . . . It is a moving equilibrium. . . . The engagements . . . that I make by nature of cooperation lead me I don't know where. (Piaget, "Logique génétique et sociologie")

Under conditions of cooperation, an activity that is initially shared by those participating in it emerges as an original and fundamental foundation for the development of *individual* activity. (Rubtsov, "The Role of Cooperation in the Development of Intelligence")

Part III discusses speculations and research on the role of social interaction in the cognitive development of individual children. What do children gain from social interaction, and under what circumstances? What aspects of social interaction contribute to children's advances? What is the significance of variations in social interaction, such as whether partners are adults or peers, the extent of their expertise, their authority or equality relative to the children, and the extent to which partners share in decision making? Are there differences in the role of social interaction depending on the age of the child?

These questions were addressed by Vygotsky and by Piaget, and they came to rather different conclusions. In this chapter, I describe the similarities and differences in mechanisms of social interactional influence on cognitive development posited by these two theorists, focusing on the importance of expertise versus equal status and the related question of the role of adults versus peers. I also address the differences in Vygotsky's and Piaget's assumptions about when in childhood social interaction can affect individual development. The next two chapters focus on research and specific speculations on the influence of interaction with adults and with peers.

I have suggested that the day-to-day engagement of children and adults in shared activities contributes to the rapid progress of children in becoming skilled participants in the intellectual and social lives of their society. With Vygotsky, I have argued for the influential role of children's engagement with more skilled partners. But such suggestions and evidence of the structure and tuning of adult–child interaction and arrangements do not necessarily demonstrate that adult–child involvement fosters children's individual learning and development. Features of adult–child interaction and arrangements may have little relation to children's learning. It is important to examine explicitly the influence of expertise of partners, of equality of status, of shared problem solving, of the structuring of children's efforts, and of the transfer of responsibility to children over the course of development.

As we do so, however, it is important to recognize that we are examining a very limited part of the question of the role of the social world in cognitive development. Part III focuses on social interaction per se; but as I have argued in Parts I and II, the social context includes much more than social interaction between partners. A primary aspect of the social context is at the level of society—the institutions, technologies, norms, and practices developed by and appropriated from previous generations.

In addition, children's social partners, especially their caregivers, make arrangements for children's daily routine, tasks, circumstances, and partners. Much of this is accomplished independently of social interaction between children and their partners. Consider the time spent by middle-class parents in choosing day care, schools, or summer camp; interviewing and scheduling baby sitters; arranging for playmates to visit; selecting and preparing children's food, clothing, toys, and furniture; and ferrying them to after-school activities. In other cultures, parents may arrange children's activities by assigning them to the care of a sibling, holding them responsible for certain tasks, or restricting or requiring their presence at certain events. Such arrangements for children have an impact on children's activities, but may not involve social interaction in the decisions or the work of arrangement.

Thus it is obvious and necessary to acknowledge the role of guided participation in learning and development. So much of what children are able to do requires their being embedded in their culture. They would certainly not learn English without exposure to that language, nor would they develop scripts for the events involved in eating in restaurants, playing Peekaboo, or reading books without involvement as observers or participants. Most of the skills studied in cognitive research are tied closely to the technology—the books, number system, language, logic—of the culture in which children develop and that children learn to master with the assistance of more skilled partners.

Like genes, social interaction and social arrangements are an essential aspect of child development, without which it would be impossible to conceive of a child developing. (Even the process of conception is inherently social!) The impact of social partners and of social conventions is a logical

necessity that is not addressed by the bounded variables and interventions examined in correlational and experimental studies of the effects of social interaction.

Most research on the effects of a particular variable requires that other variables be held constant, but with questions of the impact of sociocultural experience, it is impossible to exert such control over the phenomenon without destroying it. As I have argued earlier, the particular actions and skills of an individual cannot be understood out of the context of the immediate practical goals being sought and the enveloping sociocultural goals into which they fit.

What of processes that appear to be very stable across wide variations in the human condition? Should they be considered as not having sociocultural involvement? No. It is a fallacy to think that sociocultural processes lead to variation and biological processes lead to universals. For example, it is obvious that variations in hair color and height have genetic bases. And it is clear that universal features of human activities and skills are founded on commonalities in the social environment that go with being human.

It is easier for us to recognize the role of sociocultural variation than that of sociocultural universals, which we tend to take for granted. Human problems and some of the constraints on their solution are held in common in all human situations. It is those that *vary* that capture our attention. For example, different groups vary in their solution to the problem of communicating (e.g., using English, Spanish, or sign language) or of calculating (e.g., on abacuses, calculators, or fingers). The relation to specific social experience is obvious in these differences; it is necessary to be surrounded by English speakers to learn English. It may be necessary to be exposed to some sort of language to learn the rudiments of grammar, even those aspects that may be common across languages. But, consistent with Trevarthen's idea of innate intersubjectivity, the basics of the potential for social communication, such as turn taking and attention to others' intentions, may be inborn features of being human.

Even panhuman processes are likely to rely on the support of the social world, however. There are similarities among human babies around the world, because of both our species similarities and the panhuman social environment in which babies are nurtured. Although variations in cognitive processes and in development make the role of variations in social context obvious, universals of cognition and development are based on universals of human cultural as well as biological heritage, which cannot be dissociated. They have evolved together over the history of our species.

The role of societal institutions and intellectual technologies is central to Vygotsky's theory, but barely appears in Piaget's theory (i.e., his statement that the hypothetico-deductive thought of formal operations is based on social convention). Thus the context of the discussion of specific forms of social interaction and their impact on cognitive development differs in the two theories.

Mechanisms of Social Influence

The theories of Piaget and Vgyotsky differ in the mechanisms proposed to underlie social influence, the phase of childhood seen as being open to social influence, and the ideal partner and role relations. It is to these differences that we now turn; further discussion of points of similarity and contrast is available in Tudge and Rogoff (1989). I speculate that the differences between the theories relate to differences in the phenomena the two theorists attempted to explain.

The two theories are based on different perspectives; Vygotsky focuses on the social basis of mind, while Piaget focuses on the individual as starting point. To understand cognition in social context, I believe that Vygotsky's perspective is essential; it cannot be reached by simply adding social context onto Piaget's individualist approach.

Both theories emphasize the importance of a common frame of reference, or intersubjectivity, in social interaction. However, consistent with the difference in centrality of the social and the individual in the two theories are differences in the locus of intersubjectivity. In Vygotsky's perspective, joint problem solving occurs *between* partners, whereas in Piaget's view, individuals work with independence and equality on each other's ideas.

In Vygotsky's theory, consistent with his emphasis on development as a process of learning to use the intellectual tools provided through social history, social interaction is expected to promote development through the guidance provided by interaction with people who have achieved some skill in the use of those intellectual tools. The model of most effective social interaction is thus joint problem solving with guidance by a person who is more skilled.

In Piaget's theory, children are seen as revising their ways of thinking to provide a better fit with reality when faced with discrepancies between their own ways of viewing the world and new information. Vygotsky (1987) characterized Piaget's theory as follows: "Development is reduced to a continual *conflict between antagonistic forms of thinking;* it is reduced to the establishment of a unique compromise between these two forms of thinking at each stage in the developmental process" (p. 176). For the most part, this conflict was considered solitary, but Piaget (1926) also speculated that social interaction could bring about cognitive conflict, resulting in efforts to reestablish equilibrium. According to Piaget, social influence fosters change through the induction of cognitive conflict and the logical operations carried out by children attempting to reconcile their differing views to achieve equilibrium in their understanding. The Piagetian model of most effective social interaction is thus cooperation between equals who attempt to understand each others' views through reciprocal consideration of their alternative views.

Piaget emphasized cooperation as the ideal form of social interaction promoting development because he believed that the social relations involved in cooperation are the same as the logical relations that children construct in regard to the physical world. He considered cooperation to be a parallel

form of logic in which children discuss propositions that provoke cognitive conflict and its logical resolution, yielding equilibrium:

> Cooperation itself constitutes a system of co-operations: putting in correspondence (which is an operation) the operations of one partner with those of the others, uniting (which is another operation) the acquisition of one partner with that of others, etc.; and in case of conflicts, raising the contradictions (which presupposes an operational process) or above all differentiating the different points of view and introducing between them a reciprocity (which is an operational transformation). (Piaget, 1963/1977, p. 347)

Piaget (1977, pp. 160–162) laid out three conditions under which equilibrium is achieved in intellectual exchange. The first is that the partners have a common scale of intellectual values, allowing them to understand terms in the same sense. This involves a language and a system of ideas in which they converge, providing a key that allows each to translate into common terms the differing conceptions. The second condition is that the partners recognize a conservation of their propositions in which one does not contradict oneself, and in which the partners search for agreement on propositions or find facts that justify their difference in points of view. The third condition for equilibrium is that there is a reciprocity between partners such that the propositions of each are treated interchangeably. Piaget emphasized cognitive conflict as the working out of differences of opinion by coming to understand the other's perspective and by logically comparing the value of the two perspectives.

Vygotsky's model for the mechanism through which social interaction facilitates cognitive development resembles apprenticeship, in which a novice works closely with an expert in joint problem solving in the zone of proximal development. The novice is thereby able to participate in skills beyond those that he or she is independently capable of handling. Development builds on the internalization by the novice of the shared cognitive processes, appropriating what was carried out in collaboration to extend existing knowledge and skills.

Differences between the two theories in the model of social influence relate to important differences in the aspects of cognitive development that the theorists sought to explain. Piaget's emphasis was on children's qualitative shifts in perspective on logico-mathematical problems, whereas Vygotsky was interested in children's development of skills and information useful for the application of culturally developed tools for thinking. The resolution of cognitive conflict may be necessary for a child to discard an existing belief to consider one that is qualitatively different, to achieve a Piagetian shift in perspective, as when children realize that the quantity of water does not change when it is poured into a container of another shape. And interaction with an expert may be necessary to provide practice in skills and access to information required to become proficient with culturally developed tools for thinking.

Variation in Social Processes May Relate to What Is Developing

The nature of guided participation may differ according to whether a situation involves children's development of understanding and skill or of a shift in perspective. For present purposes, I refer to the development of understanding and skills as the integration and organization of information and component acts into plans for action under relevant circumstances (e.g., learning to tie shoes; to associate items to remember them, or to read). Shifts of perspective, for present purposes, involve giving up an understanding of a phenomenon to take another view contrasting with the original perspective. The problems that Piaget posed to children about whether quantities change when their shape is transformed are examples of shifts in perspective for children who make the transformation from nonconservation (the quantity of water changes when it is poured into a glass of a different shape) to conservation (the quantity of water does not change despite the change in its shape).

The purpose of making these distinctions is to facilitate discussion of different interactional processes that may contribute to the development of understanding and skills or shifts in perspective. The development of understanding and skills may occur with the aid of simple explanation or demonstration, but may involve fine-tuning of communication, when describing a skill out of context or providing a simple demonstration is insufficient. For example, simply telling a child how to tie a shoe is unlikely to be helpful, but helping the child hold the loops and suggesting a mnemonic for the sequence of events ("the bunny circles around and then goes down the hole") may provide the support, over a number of sessions, to assist the child in learning the skill. Similar examples could be drawn from other domains, such as mnemonic strategies, subtraction skills, and reading skills.

For social influences to enhance changes of perspective, however, it may be necessary to have greater shared communication. To see a problem from a qualitatively different vantage point requires a person to become aware that there is another perspective and that it may offer some advantages. For development of understanding and skills, individuals may more easily realize that there is information they do not know or tactics they could learn. But changes of perspective require dissatisfaction with one's current understanding of a problem. Social interaction may contribute to making the person aware that there are alternatives—for example, through the sort of cognitive conflict that Piaget posited to occur between peers who have different answers to the same question. Social interaction may then contribute to directing the individual to accept another view, through presentation of the alternatives and consideration of the merits of each.

But for such social effects to occur, some conditions must be satisfied: individuals must become aware of and interested in exploring alternatives to their own perspective, and there must be intersubjectivity between partners to explore the existence and value of the alternatives. True, interest is needed to develop understanding and skills, but there is no need to give up current
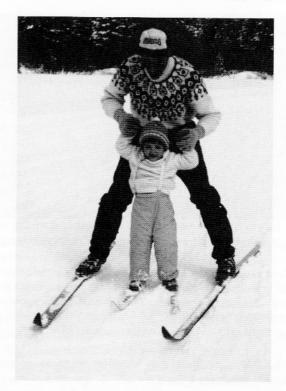
Figure 7.1   Child of 21 months being guided by her father in the development of a skill. (United States) (Photograph © B. Rogoff)

understandings to achieve "conversion"—a process that may require intersubjectivity. Understanding and skills may develop through observing or eavesdropping on actions and statements that are not intended to communicate to the observer, but mutual engagement in the exploration of possibilities may be more necessary for changes in perspective to result from social interaction.

Intersubjectivity in problem solving may also be important in fostering the development of "inaccessible" cognitive processes that are difficult to observe or explain—as with shifts in perspective as well as some kinds of understanding and skill. Communication of such processes may require skillful explanation and analysis. It is relevant to this argument that many technologies of education are designed to make opaque processes more transparent, and that many intellectual tools serve the purpose of communicating about abstract ideas or past, future, or imaginary events. For example, blueprints and time-management charts facilitate planning by individuals, but their necessity may arise in social situations, to enable people to communicate concretely about abstract ideas and to coordinate their actions. Conventions used in diagramming, gesturing, and speaking are ways of facilitating

mutual understanding by making events and ideas more concrete. Hence, learning to handle "inaccessible" problems involving nontransparent cognitive processes may rely on social conventions necessary for shared problem solving and on learning through joint participation in a process of osmosis, rather than on explanation or demonstration.

The difficulty of communicating some ideas or of negotiating mental responsibility in social groups may lead individuals to prefer to work alone. This preference may be based on expectations of greater effectiveness of individual effort, but it may also involve concern about the effort or risk of collaborative work—even though the collaboration may be more effective than individual work. Bos (1937) describes a pair of 12-year-olds who said that it is more difficult to work together than on their own "because it is not so easy to grasp the other's point of view" (p. 362). From discussion of these feelings, however, each realized that the other had the same concerns, and this understanding led to an intensive and harmonious collaboration.

> It is indeed easier quietly to pursue ones [*sic*] own thoughts than to formulate them convincingly, express them verbally and moreover assimilate proposals and ideas of the partner. This love of facility probably contributes to the opposition of people to endeavour with their mental power in active co-operation to arrive at a better achievement. (Bos, 1937, p. 362)

Through collaboration, partners may develop ways to communicate about difficult problems that advance the definition or solution of the problems.

Consideration of the different tactics one might employ in assisting a child to develop understanding and skills or shifts in perspective may clarify age differences in the impact of social guidance as well as differences between adult and peer partners—issues on which Piaget and Vygotsky differed.

What Phase of Childhood Is Sensitive to Social Influence?

Piaget and Vygotsky appear to be almost in opposition on the question of the age at which social influence contributes to cognitive development. For Piaget, development moves from the individual to the social, and for Vygotsky, development moves from the social to the individual.

According to Piaget, the young child is largely impervious to social influence because egocentricity blocks the establishment of reciprocity and cooperation in considering differing points of view. Thus, according to Piaget, it is not until middle childhood that children's intellect benefits from social interaction, when logical argument between children with varying points of view becomes possible. Young children would generally find it so difficult to consider the logic of another's point of view that they would either continue to see things from their own perspective or switch to the other person's perspective without understanding the rationale and hence without actually advancing developmentally.

The three conditions that Piaget (1977) set out for the achievement of

Figure 7.2   Children of 5 and 6 years in a tug of war, illustrating that, as Piaget pointed out, young children sometimes have difficulty coordinating their efforts. (United States) (Photograph © B. Rogoff)

equilibrium are not possible with egocentrism. First, there is not a common scale of reference in terms of language and ideas to allow a durable exchange of ideas. Second, there is not sufficient conservation of propositions (commitment to sticking to what you have said before) to oblige children to take account of what they have said or agreed to in order to apply these propositions in subsequent propositions. And third, there is not reciprocity between the partners to allow coordination of propositions.

Piaget (1977) specified that at the stage of concrete operations (from about 7 to 11 or 12 years), children become able to cooperate and to coordinate points of view. "Thus the child becomes capable of discussion—and from this internalized discussion, and that conducted with oneself, which is reflection—of collaboration, of arguments that are orderly and understandable by another" (p. 157). Piaget suggests that cooperation provides an impetus to order thought in logical operations that involve a system of propositions that are free from contradiction and are reversible: "Thinking in common promotes non-contradiction: It is much easier to contradict oneself, when one thinks for oneself (egocentrism) than when some partners are there to remember what one has said before and the propositions that one has agreed to admit" (Piaget, 1977, p. 157).

The importance of social interaction and the role of society becomes more obvious in the next stage, formal operations: "Things are even clearer in the formal stage, which begins after 11–12 years, since hypothetico-deductive thought is above all thought supported by a language (common or mathematical) and is thus collective thought" (Piaget, 1977, p. 158).

Vygotsky's approach contrasts with Piaget's in its assumption that from the beginning the child is a social being, involved in social exchanges that guide the development of higher cognitive processes:

The child's rich and complex social contact leads to an early development of means of social connection. It has been clearly demonstrated that simple though unique reactions to the human voice are present in the third week of life (i.e., the presocial reactions) and that the first social reactions appear by the second month. . . . Laughter, babbling, pointing, and gesture emerge as means of social contact in the first months of the child's life. . . . However, the most important event in the development of the child's thinking and speech occur at approximately two years of age. . . . This critical moment, the moment when speech becomes intellectual and thinking verbal, is marked by two clear and objective symptoms. . . . First, the child who has attained this level of development begins to *actively expand his vocabulary* by asking the name of each new thing he encounters. Second, these efforts result in an extremely rapid increase in the child's vocabulary. (Vygotsky, 1987, pp. 110–111)

In contrast with Piaget, Vygotsky assumes that social guidance aids children in learning to communicate and to plan and remember deliberately from the first years of life. This guidance provides children with the opportunity to participate beyond their own abilities and to internalize activities practiced socially, thus advancing their capabilities for independently managing problem solving.

Newson and Newson (1975) cite Vygotsky's perspective in their argument that from earliest infancy, children are guided in development by social interaction.

Knowledge itself originates within an interaction process (highly active on the part of the infant) between the infant himself and other, more mature, human individuals who already possess shared understandings with other communicating beings. Furthermore, these shared understandings are embedded in a uniquely human way of conceptualizing the world in spatial and temporal terms. In short, the child only achieves a fully articulated knowledge of his world, in a cognitive sense, as he becomes involved in social transactions with other communicating human beings. (p. 438)

Through such dialogues-of-action, the infant becomes thoroughly familiar with the role of a skilled communicator, participating in forms of communication long before he is able to understand the full content of what is being communicated. (p. 445)

Vygotsky argued that rather than deriving explanations of psychological activity from the individual's characteristics plus secondary social influences, the unit of analysis should be social activity, in which individual functioning develops (Wertsch, 1985). Piaget's approach was the reverse—to focus on the individual as the unit of analysis, with social influence overlaid on the individual's activity, after the child becomes able to take another person's perspective. These differences in the timing and centrality of social influence may relate to Vygotsky's focus on development of understanding and skills in using cultural tools and Piaget's focus on qualitative shifts in perspective.

Peers Versus Adults: Equal Status Versus Expertise

The two theorists attributed varying degrees of importance to the roles of adults and peers. Piaget (1926) emphasized peer interaction, with its exploration of cognitive conflict between companions of equal status. An example is provided by two 5-year-olds quarreling over drinks of soda that had been poured into glasses of different shapes (an everyday situation resembling Piaget's conservation task). An adult had attempted to pour equal quantities for the two children, but since Valerie's glass was tall and thin, and David's was wide and flaring at the top, the quantities were not obviously equal. Valerie attempted to convince David of the fairness of the distribution:

"Yours is fatter and mine is thinner, that's why it looks like I have more. See, I have to squeeze my hand to get it into my cup, but not into yours. [She squeezes her fingers together and puts them into the opening of each cup to demonstrate.] It's just that mine is thinner so it looks like it has more."

The children proceeded to quench their thirst. It is such interaction between peers, Piaget argued, that can lead children to reconsider their ideas.

In contrast, Piaget felt that children's discussions with adults are unlikely to lead to cognitive restructuring because of the unequal power relations between adults and children. Only when children are able to discuss problems as equals are they likely to take into account new ways of thinking. Interaction with an adult, Piaget held, is essentially unequal; it is an asymmetric interaction in which the adult has the power, and this disrupts the condition of reciprocity for achieving equilibrium in thinking (Piaget, 1977, p. 165). "The child's socialization with his fellows is greater than, or at least different to, his socialization with adults alone. Where the superiority of the adult prevents discussion and co-operation, the playfellow provides the opportunity for such social conduct as will determine the true socialization of the intelligence" (Piaget, 1926 [3rd ed., 1959], p. 258). When peers have different perspectives, no such asymmetry exists: "Criticism is born of discussion, and discussion is only possible among equals: cooperation alone will therefore accomplish what intellectual constraint [caused by unquestioning belief in the adult's omniscience] failed to bring about" (Piaget, 1932, p. 409).

According to Piaget, the effect of lessons from adults is for young children to abandon their own ideas for those presented, since their ideas are poorly formulated and exist only as an "orientation of the spirit" that cannot compete with the views of adults. But in such cases, children agree without examining the idea, and they do not learn to verify for themselves. Not until adolescence do children learn to discuss as equals with their teachers, when they have "conquered their internal liberty" (Piaget, 1928/1977, p. 230).

Although Piaget argued that children's interaction with adults does not promote their cognitive development, his focus was on the use of adult authority. He allowed for the possibility that adults may be able to interact with children in a cooperative fashion that permits the sort of reciprocity required for children to advance to a new level of equilibrium:

It is despite adult authority, and not because of it, that the child learns. And also it is to the extent that the intelligent teacher has known to efface him or herself, to become an equal and not a superior, to discuss and to examine, rather than to agree and constrain morally, that the traditional school has been able to render service. (Piaget, 1928/1977, p. 231)

For Vygotsky, ideal partners are not equal, but the inequality is in skills and understanding rather than in power. For this reason, interaction with either adults or peers can bring about cognitive growth. But for cognitive development to occur in the course of interacting with a peer, the partner should be "more capable" (Vygotsky, 1978).

Vygotsky's emphasis on interaction with more skilled partners is necessary to his theory, since such interaction is conceived as the means by which children begin to use the intellectual tools of their society. Thus the partner must be someone who knows more about the tools than does the child. By the same token, Piaget focused on changes in perspective, from one view of a problem to another, based on his interest in understanding qualitative transitions in the philosophy of science and logic.

The contrast I made earlier between developing understanding and skill and shifting perspective thus seem to relate to the status and relative expertise desirable for children's partners. A similar perspective is offered by Damon (1984) and Subbotskii (personal communication, 1988), who suggest that different types of learning may be differentially facilitated by equal or by more expert partners. Focusing on the relative advantages of interaction with more expert peers (in tutoring) and equal peers (in collaboration), Damon (1984) suggests that

> peer tutoring may be used whenever students need to acquire information or skills that do not extend beyond their conceptual reach. Learning historical facts, practicing word attack skills, becoming adept at multiplication tables, even figuring out how to make use of a computer . . . draw upon features of basic understanding that the child has already developed. . . .
>
> Peer collaboration, on the other hand, . . . is an ideal technique for encouraging children to wrestle with intellectual challenges in difficult new principles. Learning to communicate accurately through written and spoken language, grasping the logic behind scientific formulas, and realizing the political rationale underlying a societal governance system can all be fostered in a collaborative peer interaction context. Such intellectual accomplishments stretch the boundaries of children's mental abilities. Consequently, they flourish best under conditions of highly motivated discovery, the free exchange of ideas, and reciprocal feedback between mutually respected equals. These are precisely the characteristics of collaborative interchanges between children. (p. 340)

Intersubjectivity: Theoretical Convergence and Differences

The theories of Piaget and Vygotsky share an emphasis on the importance of partners' understanding of each other. For Piaget, the partners must have a

common language and system of ideas, and must grant reciprocity in attempting to examine and adjust for differences in their opinions. Piaget emphasized logical consideration of alternative perspectives provided by coming to understand another person's point of view.

For Vygotsky, the child is assumed to be interested in gaining from the ★ more expert partner, who is seen as responsible for adjusting the dialogue to fit within the child's zone of proximal development, where understanding is achieved with a stretch leading to growth. Both perspectives are similar in ★ stressing the importance of a match between partners involving shared thinking, and the importance of the child's understanding as the point of departure.

The role of shared thinking has received attention in the Vygotskian tradition in Wertsch's (1984) writings on "intersubjectivity," building on the work of Rommetveit (1985). It also appears in the work of Perret-Clermont and Schubauer-Leoni (1981) in the Piagetian tradition. The notion of intersubjectivity seems inherent in Piaget's view of social influences, but has been overlooked by some Piagetian scholars who focus on cognitive conflict as quarreling. Both theories and, increasingly, the literature on social influences focus on the role of intersubjectivity in social interaction (Forman & Kraker, 1985; Rogoff, 1986; Tudge & Rogoff, 1989; Youniss, 1987).

Despite the agreement between the two theories on the importance of sharing perspectives or thinking together, there is an essential difference in their conception of intersubjectivity. It relates to the contrast between them in the centrality of their focus on the social versus the individual. For Vygotsky, shared thinking provides the opportunity to participate in a joint decision-making process from which children may appropriate what they contribute for later use. For Piaget, the meeting of minds involves two separate individuals, each operating on the other's ideas, using the back-and-forth of discussion for each to advance his or her own development. This discussion is the product of two individuals considering alternatives provided socially, rather than the construction of a joint understanding between partners.

Forman (1987) discusses this distinction in collaborative problem solving in Piaget's and Vygotsky's theories. In Piaget's theory, collaborative problem solving is explained by deriving both cognitive and social processes from the same central intrapsychological process, whereas in Vygotsky's theory, the correspondence between cognitive and social processes is due to the derivation of individual cognitive processes from joint cognitive processes in social contexts.

These differing interpretations are accompanied by differences in the proposed mechanisms of cooperation. Forman (1987) contrasts intersubjectivity as a process that takes place between people from the Vygotskian perspective, with perspective taking or decentering as individual processes working on socially provided information from the Piagetian perspective.

A similar distinction also appears in the work of Rubtsov (1981), who observed that children's difficulties with the class-inclusion problem are sometimes resolved while collaborating with agemates, and these advances persist after the interaction. Rubtsov appears to agree with Piaget in focusing on par-

allels between the organization of joint activity and the organization of thought, but emphasizes the facilitation provided by the social arrangements and shared activity: "The relations determining the logic of an intellectual structure consist of compact condensed forms of mutual relationships among the participants in cooperation" (p. 59).

Thus although both theories—and the research deriving from them—emphasize cooperation in cognitive activity, they differ in the extent to which the process of cognitive development is seen as occurring in this cooperative interaction. For Piaget, the cooperation provides information for the individual to use in becoming aware of differing perspectives and in resolving the differences between them. In the Vygotskian perspective, in contrast, the individual makes use of the joint decision-making process itself to expand understanding and skill. Cognitive development from a Piagetian view is a product of the individual, perhaps sparked by having to account for differences in perspective with others, whereas cognitive development from a Vygotskian point of view involves the individual's appropriation or internalization of the social process as it is carried out externally in joint problem solving.

Piaget's view is thus a limited version of social impact on the individual's cognitive development; in taking the individual as the basic unit, it does not reach a collective perspective on the social context of cognitive development. It is important, as far as it goes, but does not make the necessary shift in perspective to encompass the social construction of meaning. To understand how individuals are embedded in the social world, it is necessary to grant that meaning is more than a construction by individuals. Of course, it is essential also to consider the process by which socially constructed meaning is used by individuals. This is the question of internalization, which has been raised by a variety of theories but deserves much more attention than it has received. In Chapter 10, I address the question of how individuals appropriate socially constructed meaning to advance their own cognitive development.

The remaining chapters consider speculations and research on the roles of adults and peers, of expertise and equality, and of intersubjectivity. Intersubjectivity may vary according to the status roles of partners. It may be that involvement in each other's thinking is limited to situations in which partners treat each other's ideas and skills as equally important. However, when the status of partners differs greatly, as when one partner is an expert or has more authority than the other, an asymmetrical intersubjectivity may operate, with partners involved in joint decision making and understanding, but one is more responsible for stretching to reach the other's ground. This contrast is especially important because of the cultural differences across communities in the status roles of caregivers and children, who may engage as peers in mutual conversations or may share in joint activity with asymmetrical roles—with both types of intersubjectivity supporting children in developing the skills and perspectives of their society.

8

Evidence of Learning from Guided Participation with Adults

David, age 7½ months, was at a restaurant with his parents and seemed to be getting bored. His mother handed him a dinner roll, although until then he had eaten only strained foods, zwieback toast, and Cheerios. David happily took the roll, examined it, looked up at his mother, and said, "Da?" as he held the roll up near his mouth. His mother replied automatically, "Yes, you can eat it."

The child acts (or is made to act) as if he or she had a plan or strategy before it is possible to devise and carry out that strategy independently. The child does not first master a strategy that guides action and then begin to act, but first acts and then begins to master the strategy that guides the action. . . . The child begins to regulate his or her own activity by becoming aware of what has already been going on for some time under the direction of others. (Wertsch, "Adult–Child Interaction and the Roots of Metacognition")

The fluency with which Mozart composed seems to be the outcome of his particular, intensive apprenticeship, of his opportunities to internalize, while still very young, the musical possibilities developed before his time. (John-Steiner, *Notebooks of the Mind*)

This chapter examines research on the consequences of children's interactions with adults for their cognitive development. In the routine and recurrent interactions between adults and children are many thousands of opportunities for guided participation in solving everyday problems. We tend to overlook the numerous, implicit everyday opportunities for children to gain understanding and skills of the world around them. As Rheingold (1985) argues, development is largely a process of becoming familiar. It may be through repeated and varied experience in supported routine and challenging situations that children become skilled in specific cognitive processes. For example, Ferrier (1978) and Newson and Newson (1975) argue that the opportunity for language development occurs in routine participation in shared experiences and