COGNITIVE ASPECTS OF DEMOCRATIC THINKING

Chapter 7

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THE DEVELOPMENT OF DEMOCRATIC character can be studied from several different perspectives, among them cognitive psychology and the broader, more general, and interdisciplinary cognitive science. Cognitive psychology studies human reasoning and cognition as information processing. This processing involves not only such basic mechanisms as how we perceive, decode, represent, store, and retrieve information but more complex mental phenomena as well, including how we use knowledge in a familiar context, how we apply our existing knowledge to novel situations, how we draw inferences, and how we make decisions.

In the past few years, spectacular development has taken place in the field of learning and instruction, especially in areas influenced by cognitive science. Developing democratic character, one of the main aims of schooling, cannot be isolated from other processes of teaching. However, research into learning and instruction shows little overlapping with the research into democracy and education. Therefore, in this chapter I relate these two areas of research to show how methods of the cognitive approach can be extended and how its results can be applied to the field of democratic education.

Since *democracy* is, in common usage, a political term that is discussed in an educational context as mostly related to values and virtues, it is not obvious that cognitive science has a relevant message for those who aim at developing democratic character. Therefore, I first outline the historical background of the differentiation of the affective and cognitive

domains and trace the roots of their integration into unified frameworks. Then I discuss some of those cognitive processes that are involved in democratic thinking.

Research into social cognition has already identified a number of mental processes that play important roles when we think and make decisions in social contexts. However, cognitive research, especially the application of its results to education, has continuously been changing our view of the values and qualities of knowledge and has been reshaping the methods that are used in the schools to fulfill their basic missions. Beyond transmitting knowledge, other objectives receive growing attention in schooling: teaching thinking, improving cognitive abilities, and developing problem-solving skills, for example. New research provides us with theoretical frameworks and empirical evidence to satisfy these aims. These new resources also allow us to rethink the consequences of recent changes in the study of cognition for developing democratic character. Contemporary research suggests a new view of how we form mental representations of our social environment, accumulate our experiences, build a knowledge base about social phenomena that we face in everyday life, solve complex problems that involve social relationships, and make decisions in social situations.

The Relationship of the Cognitive and the Affective

Can we help our students to be more democratic thinkers by cultivating their cognitive capacities? Everyday wisdom suggests that being smart does not necessarily imply being moral; history has shown us that human intelligence can be used for good and bad purposes alike. On the other hand, it seems obvious that in order to make good and morally right decisions in situations that we face in a complex society, not only do we have to possess knowledge, we also need a number of highly developed social and cognitive skills that function smoothly and efficiently together.

This question of the relationship between cognitive and affective characteristics is not new at all. Philosophers and educators attempt to answer it from time to time. One of the earliest conceptualizations of this relationship was put forward by Greek philosophers around two and a half millennia ago. Socrates, who represented a firm view of moral intellectualism, nevertheless considered moral and intellectual virtues one and the same. He thought that all virtues were merely forms of scientific knowledge. According to Socrates, no one acts wrongly on purpose; the only cause of an immoral action is the lack of proper knowledge and intellectual capacity to find the right action. In short, the one who knows is good.

Not much later, Aristotle clearly differentiated two classes of virtues that we today would categorize as the cognitive and affective domains. He also distinguished the ways these virtues are acquired: "Virtue, then, being of two kinds, intellectual and moral, intellectual virtue in the main owes both its birth and its growth to teaching (for which it requires experience and time), while moral virtue comes about as a result of habit, whence also its name *(ethike)* is one that is formed by a slight variation from the word *ethos* (habit)."[1]

Aristotle not only identified these types of virtues, but he analyzed the relationship between them as well. After further differentiating the types of virtues and examining their connections, he concluded that moral and intellectual virtues mutually suppose each other's existence. As for the moral prerequisites of the cognitive side, he wrote: "Therefore it is evident that it is impossible to be practically wise without being good."[2] On the other side, moral virtues require intellectual foundations: "It is clear, then, from what has been said, that it is not possible to be good in the strict sense without practical wisdom, nor practically wise without moral virtue. But in this way we may also refute the dialectical argument whereby it might be contended that the virtues exist in separation from each other."[3]

It is often said that the history of science is mostly an elaboration of what Aristotle outlined in his philosophical works. Of course, scientific research has accomplished much more than Aristotle could ever have envisioned, but there is at least a morsel of truth in this statement. As for the relationship of the affective and cognitive attributes of the personality, his instructions may undoubtedly be followed.

After the birth of modern psychology and the educational sciences, several theorists working in different paradigms examined the relationships between cognitive and affective attributes. Jean Piaget, who devised one of the most complex and sophisticated cognitive developmental theories, extended his methodology to the study of moral development. He pointed out that children's moral judgment involves a number of cognitive components that are characteristic of specific ages.[4] Lawrence Kohlberg elaborated on this idea, basing his theory of the development of moral reasoning on children's cognitive development.[5] William Damon, employing a slightly different approach, also examined the relationships of reasoning and morality.[6] These studies and many others have shown that cognitive and affective—or moral and intellectual—attributes are closely interrelated, and their developmental processes are interdependent.

In schooling, on the other hand, the cognitive and the affective have often been separated. Instruction, that is, transmitting knowledge or cul-

tivating the intellect, historically took place apart from improving morals: at different times, in different places, often in different institutions. Such frameworks as Bloom's cognitive taxonomies of educational objectives have appeared only recently on the educational scene. Although still separating the cognitive and affective domains, they treated the goals of both in an equal manner, or at least they handled them within the same comprehensive system. By offering methods for determining educational objectives more precisely, these taxonomies, despite their shortcomings, opened the way for a great deal of improvement in identifying the goals of education. And by providing patterns for the operationalization of affective goals, they also pointed the way to strengthening the moral side of schooling. One of the obstacles to encouraging the development of value systems in education is that although there is agreement on the importance of moral goals, these goals fade away as they are translated into a curriculum and as the curriculum is implemented in educational practice. Bloom's work made it possible to identify the affective goals at the level of observable behavior, and thus to monitor the curriculum's implementation. Unfortunately, however, the taxonomy of the affective domain was completed much later than that of the cognitive domain and has remained in the shadows, receiving much less attention and exerting much less influence than the cognitive taxonomy.[7]

In general, at the level of theoretical analysis we have to distinguish between these two notions under discussion. The cognitive and affective domains (or the intellectual and moral) are different enough to be analyzed and described separately. Furthermore, in the course of empirical research, attention may be focused on one or the other. Thus, there is no problem with the separation and differentiation if they take place at the level of scientific analysis. But results of recent cognitive research also suggest that the different components of democratic character are so closely interrelated that their developmental processes cannot be separated.

Democratic Thinking as a Cognitive System

If there exist areas in the study of cognition that are complex and do not lend themselves easily to a rational conceptual analysis, democratic thinking must be counted among them. However, the framework of today's cognitive psychology offers a variety of approaches, methods, and models to study human cognition; the continuous shift that is taking place in cognitive science, particularly within the cognitive psychology of school learning, makes these approaches more and more relevant for the study of the development of democratic thinking. These changes, although not

independent of each other, take place in a number of different directions. The emphasis of research is moving from simple to complex, from content free to content bound, from context independent to context dependent, from individualistic to socially determined, from receptive to constructive, from active to interactive attributes of thinking, from direct instruction to applying indirect effects, and from teaching to organizing influential learning environments.

Earlier paradigms emphasized the universal attributes of thinking, with research focusing on its structure and form. These paradigms, ranging from the psychometric approach to Piagetian theory, paid little attention to the particular attributes of cognition, to its specific content, or to the environment in which it takes place. The first models of cognitive psychology considered the computer as the best metaphor of human cognition. Recent comparative studies, however, have revealed that thinking is much less computation-like and much less rational than early frameworks suggested. General thinking operations or formal thinking schemes play a much less significant role in everyday, real-life problem solving than previously supposed. Therefore, not only the structure but also the content of thinking is significant in determining its efficacy. Furthermore, domain- and context-specific thinking patterns are the mental tools that make human cognition really efficient.[8] These new focuses of cognitive research have their consequences for developing democratic thinking as well.

If the content of thinking is more crucial than its structure, then the possibility of transferring knowledge from one situation into another is limited. A more general aspect of this issue is the relationship of situation and social context. Early cognitive theories focused on the mechanisms of knowledge acquisition in pure, laboratory-like situations. Since knowledge mastered in such situations—including many school settings—is hardly applicable in other, especially real-life, ones, a number of theoretical frameworks have been proposed to conceptualize this feature of human learning and cognition. Technically, the theory of situated cognition, as Clancey formulates it, "claims that every human thought and action is adapted to the environment, that is, situated, because what people *perceive,* how they *conceive of their activity,* and what they *physically do* develop together."[9]

In a slightly different way, almost the same can be said about the role that contexts play in the application of knowledge. A number of studies in several domains (many of them dealing with problems in the fields of mathematics and science education) indicated that even when problems or tasks are well defined and their structures are identical (or isomorphic, to use the usual term of cognitive psychology) there may be great differences in solving these problems, depending very much on how familiar

the contexts of the problems are. Ceci and Roazzi describe this phenomenon as follows:

> Transfer of learning across contexts appears to be quite limited. In fact, outside the case of those rare individuals who are recognized as brilliant, the norm is for subjects not to transfer. Depending on how much knowledge one possesses about the theme in question, and the social implications of various aspects of the physical context, cognitive processes will be deployed with differential efficiency.
>
> The failure to transfer learning from one context to another is pervasive, including both the young and old, educated and uneducated, and high and low IQ. . . . Based on the available research, it appears that even those students at good universities who take ample science, statistics, and math courses do not transfer the principles they learn in these courses to novel contexts.[10]

If this pessimistic account is true for mathematics and the sciences, where the structure of knowledge is more transparent and students spend hundreds of hours of concentrated effort to master the subjects, what can we say about the social studies? In the social sciences and the humanities, knowledge is much less well structured, and general principles are often hidden or overshadowed by incidental elements. There are more subjective components involved, and facts can be interpreted from many different points of view.

In our everyday lives, we learn patterns that differ from situation to situation. Politeness, for example, and the customs of good manners are context and situation specific to a great extent. We are socialized to behave in very different ways even in basically similar situations. Our decisions are influenced by particular rather than general attributes of interpersonal relationships. Academic school settings, peer groups, families, and workplaces offer different social environments in which to interact with others or to solve problems that involve other persons. In these environments, we even use different languages to negotiate and discuss issues or just to describe and communicate our experiences. We may well ask again whether these different settings facilitate the development of the same thinking schemes. Can the skills acquired in one of these situations be easily applied in another? To answer this question, let us consider what research says about the process of gathering experiences, representing and storing knowledge in memory, and retrieving and using that knowledge.

There is always a temptation to describe the acquisition of personal knowledge by using the model of how the sciences accumulate scientific

knowledge. However, in spite of inevitable parallels in these processes, the components of the fine mechanisms are rather different. Scientific investigations are collective efforts; use a number of different resources, tools, and equipment; may aim at discovering the deeper structures of the examined phenomena; and construct general, formal models. In contrast, in our personal processes of accumulating experiences, what we first perceive are the surfaces of phenomena, and since we lack the resources and instruments of digging deeper, we usually represent and store in our minds what we have found at the surface.

This is especially apparent in social cognition, the process by which we gather experiences about our social environment. Cognitive psychology has suggested a number of conceptions, such as schemes and frames, to name and describe those larger units of meaning that can be identified in our organized body of knowledge. In the field of social cognition, stories are among such larger units or building blocks of our knowledge. Roger C. Shank has advanced one of the most well-known and most radical (and therefore most disputed) views of the role of stories in organizing knowledge. He claims that almost all of our social knowledge is represented in the form of stories.[11] Others, taking broader and less radical perspectives, argue for the relevance of a number of personalized storylike constructions that have been identified in several fields of research. Such constructions as narratives, accounts, autobiographies, and scripts indicate a convergence of research in social, cognitive, personality, and developmental psychology. As Harvey and Martin explain, "Storylike constructions that we call accounts . . . represent the *principal* grounds for understanding and conveying meaning, generally in social discourse. There would be no discourse nor meaning in social acts without the drive and ability to construct and report stories."[12]

Since stories are deeply personal constructs, different persons may form different stories about the same situation, and since stories for the most part capture the surface attributions of a phenomenon, an individual may compose different stories about situations that a more thorough analysis would describe as identical. For example, a child may construct a story about a phenomenon that a researcher may term "accepting others' point of view," but it may be a story about authority, friendship, or love, depending on whether it takes place at school, in a group of peers, or in the family. Since there are few coincidences between school experiences and those gathered within peer groups or the family, these experiences are usually represented as different stories.

In this framework, understanding other people means mapping their stories into ours. The impact of broader culture can be taken into account

by the concept of *story skeletons*. In every culture there exist a number of story skeletons—basic common frames or structures (for example, "The teacher does not like my child.")—and when we are composing our personal stories, we may tap this common base. This common base offers good opportunity for education to influence students' construction of personalized stories about, for example, democratic practices. The other side of the coin is, again, the impact of diverse incidental peculiarities: there are no two identical understandings of the same phenomenon, and personalized versions of story skeletons may also be very diverse.

A similar construction, the script, can be considered as a common outline or generalized essence of stories that take place in identical or similar situations and therefore is also a relevant concept from an educational point of view. "A script is a set of expectations about what will happen next in a well-understood situation," observe Schank and Abelson.[13] It is a kind of structure of sequential events in which we may know our role or how we are supposed to act to make a story happen. Those teaching democratic practices might do well to focus on encouraging students to acquire the proper scripts.

Taking all this into account, we cannot expect that the principles students learn concerning society, social relationships, and democracy or the thinking skills they acquire in certain contexts will easily transfer to others. Thus, it is obviously not enough for us to teach broad democratic ideas in the schools. Children cannot be expected to apply these ideas to every specific situation of life; they have to learn these again and again in each new case. Or, at least, transfer does not come automatically; it requires further learning and practice if the same reasoning operations or structures are applied to new contents. For example, students who have just mastered a certain form of equality in one context—perhaps a set of rules for distributing among themselves some money that they have earned together—cannot necessarily apply the same conceptions of equality or rules of distribution when another type of reward is to be shared, such as the possibility of visiting an amusement park. Children may understand rules at a concrete level—for example, as thinking about money in the first case—and not at a deeper level that involves comprehending underlying principles.

If recent research suggests that human cognition is so much less rational than we have believed before and if the transfer of knowledge is so limited, how can we manage our lives at all? How can we use our knowledge to solve complex problems? One of the keys to understanding this paradox is that in most real-life situations, we base our decisions on experiences resulting from the same or very similar situations. We use particular

information and rely on our tacit knowledge. Instead of transferring general skills mastered elsewhere or using "global" knowledge, we use specific skills mastered, as it were, at the site of the use.

Knowledge Base for Democratic Thinking

Discussing the content of thinking, John Dewey wrote over eight decades ago: "The material of thinking is not thoughts, but actions, facts, events, and the relations of things. In other words, to think effectively one must have had, or now have, experiences which will furnish him resources for coping with the difficulty at hand."[14] As Dewey noted, we obviously cannot think about nothing. Thinking needs a subject. The computer analogy may help to explain what this may mean in an information-processing model. Computer programs process certain types of information: word-processing programs deal with text, spreadsheets manage data, other programs process pictures, music, and so on. If it is functionally the analogue of software, thinking also requires information to handle. However, human information processing does differ from that of computers, especially when development is also taken into account. Processing mechanisms are attached to the information they process. A bond is formed between thinking and the content (domain, situation, context) on which it has been executed. In other words, cognitive competencies are domain specific and context linked to a great extent. Therefore, if the development of democratic thinking aims at expanding its functioning into broad areas of the social environment, it needs an adequate knowledge base for practice. In short, democratic thinking has to be contextualized properly. Its supporting knowledge has to be taken from domains that form natural subjects of thinking in school and in real-life contexts alike. But what kind of knowledge base would best serve democratic thinking? Nothing less than the knowledge we need to live in a democratic society.

In complex situations, democratic behavior (that is, democratic acting and decision making) requires a broad knowledge that can be obtained from several different sources. If the concept of democracy is not limited to political processes, and the purpose of education goes beyond reproducing the labor force, practically every relevant area of culture has its place in the knowledge base that democratic thinking requires.[15] However, different areas of culture play different roles in such an educational process: some may have direct effects, and others may be more indirect. From this analysis, two main domains of knowledge can be distinguished: general knowledge about information from a number of areas required for leading a successful life in today's democratic societies and knowledge required for

acting in a democratic way in decision-making situations that a person faces at both the individual and the social levels.

In traditional school curricula, instruction is organized mostly according to the disciplines of the arts and sciences, and the coherence of knowledge is derived from each discipline. This setup may be satisfactory if the school intends to train future scientists or disciplinary experts, but it does not always fit the purpose of educating citizens. Cultivating students' minds and preparing them to be democratic thinkers requires a different logic of organization in education than that required by the teaching of the disciplines. In recent decades, researchers have continuously analyzed how school instruction should be changed and how it could be better adapted to the cognitive-developmental processes of children.[16] Instructional innovations aimed at improving the quality of students' knowledge have been organized around topics such as "teaching for understanding."[17]

How instruction should be better adapted to the needs of a democratic society has also been a continuous topic in the discourse on renewing education. Especially since the publication of Dewey's influential *Democracy and Education* in 1916, such questions as what democracy precisely means, how its attributes can be characterized in an educational context, and how educational processes can be tuned to its needs have become major issues. In this discourse, several new kinds of curricula have been proposed that draw from a wide spectrum of different traditional disciplines and new areas of research.[18] These curricula that focus on teaching for democracy—if we use this paraphrase of "teaching for understanding"—ensure coherence through the organization of teaching and learning around the aims of educating democratic citizens.

One of the most interesting aspects of Dewey's works is that he connected cognitive and democratic aspects of education very early.[19] Recently, exciting research has been published that combines these two aspects within the latest theoretical frameworks and provides cognitive analyses of teaching in several content areas that may significantly contribute to developing democratic character. Particularly noteworthy results have been reported in research on science education and social studies. For a long time—from Piaget's experiments until the latest research—conceptual development was characteristically studied through concepts from the natural sciences. Science education, especially in some of its current approaches, has a prominent place in "teaching for democracy," but social studies offers even broader possibilities. Recent research has proven that even the most classical area of social studies, history, can offer a wide range of new possibilities to shape students' society-related conceptual

frameworks.[20] At the same time, researchers have developed and studied several concepts related to society and social organization that inevitably belong to that core of knowledge required for democratic thinking. In contrast to most previous studies that focused on the problems of particular disciplines, these recent ones approach teaching from a consideration of the needs of children's cognitive development. The development of students' conception, the process of conceptual change, and the interaction between development and instruction are among the most promising but so far not exhaustively studied topics. As Torney-Purta remarks:

> Even with the recent explosion of research on reasoning, two important questions concerning adolescents' thinking about political and social issues remain: How do we define conceptual change in the social and political domain of knowledge dealing with contemporary political events and with historical events? and What is important about developmental processes as they intersect with instructional processes to influence conceptual change in this domain?[21]

If the school introduces certain society-related concepts too late or if the curricula introduce concepts in a highly abstract, formal, and sterile manner, we face a danger. Children's conceptual development begins earlier and may take a different path than would be desirable; consequently, later they remain uninfluenced by school education. Research on science misconceptions provides a massive body of evidence on how children's simple generalizations and naive models may differ from the scientific knowledge that the school intends to transmit to them. Society, one of the most complex subjects of scientific research, seems to be difficult to describe in models that fit students' early developmental levels. Therefore, in traditional schools, social studies in the primary grades present simple historic stories—if such a field of study exists there at all. Themes that demonstrate concepts related to social processes and the structure of society are introduced later, and sometimes too late. On the other hand, our daily experiences as well as developmental research show that children's understanding of some crucial social concepts emerges very early.

The development of ideas related to society and social organization, which are inevitably parts of a knowledge base that democratic thinking requires, has recently become part of mainstream cognitive research. And instead of exploring how canonized scientific knowledge can be taught, research moves closer to children's real-life learning and developmental processes. Delval characterizes this shift as he experienced the change of focus in his own research: "For many years we have been studying chil-

dren's ideas about different aspects of social institutions. More recently we started to look at the ideas they have about how society is structured and how they understand social differences and social strata change."[22]

Concepts such as possession and ownership are among the first things children learn in modern societies, and they gain hands-on experiences with money and prices at a very young age. Children may also have experiences that build their understanding of poverty, wealth, profit, and the sources of wealth.[23] If schools do not deal with these concepts early enough and do not help students to elaborate them by encouraging children to think about such concepts in a proper context, they may become fossilized in a simple or primitive form. Other concepts that extend thinking in the moral and democratic dimensions, such as equity and equality, which seem abstract but are nevertheless vital for democratic thinking, should also be involved very early in money- or economy-related thinking and should be associated inseparably with the other more materialistic and easily accessible conceptions.

Developmental research has also shown that children's conceptual framework of the organization of society emerges early. Some basic concepts—for example, social contract—are rooted in children's everyday experiences or originate from the family or peer groups. Others are shaped mostly by formal education: for example, the state, state formation, government, and law. But studies also point out that in school instruction, even such crucial concepts are not always properly treated. High school students may face difficulties when asked to interpret sociopolitical concepts such as reform, civil rights, or social class. At best, most of them can mention some examples.[24]

The changes taking place in science education in these years also drive learning closer to the aims of democratic education. The new way of thinking is indicated in the discourse about the mission of schooling by the replacement of the phrase "teaching of physics, chemistry, and biology" with "science education." The aim to provide future citizens with a broad scientific literacy is demonstrated by projects that are organized around the concepts of "science for all students," "everyday science," and "home science." All of these highlight the intention that general and compulsory schooling should concentrate on relevant, socially valid knowledge, while the transmittal of disciplinary knowledge may be left to the special training of future experts.[25]

There seems to be international agreement about this orientation of science education. Documents of international organizations, as well as theoretical frameworks of large-scale international assessment endeavors, emphasize the role of scientific literacy in the democratic operation

of the society as a facilitator of decision making. For example, in the Programs for International Student Assessment (PISA) project that aims to assess students' knowledge every three years in Organization for Economic Cooperation and Development countries, scientific literacy is defined as "the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity."[26] And later, when the decision-making element is elaborated, the document highlights the importance of contexts and values:

> The phrase *understand and help make decisions* indicates first, that an understanding of the natural world is valued as a goal in itself as well as being necessary for decision making and, second, that scientific understanding can contribute to, but rarely determines, decision making. Practical decisions are always set in situations having social, political or economic dimensions and scientific knowledge is used in the context of human values related to these dimensions. Where there is agreement about the values in a situation, the use of scientific evidence can be non-controversial. Where values differ, the selection and use of scientific evidence in decision making will be more controversial.[27]

Thus, as exemplified in the PISA framework, a knowledge base is a necessary but not sufficient contribution to decision making. Decisions are always made in specific contexts. Since it is not always ensured that students can transfer their knowledge from one context to another, a number of new, integrated areas of research and fields of study have been emerging to help students study science in a social decision-making context. For example, science-technology-society (STS) courses integrate scientific knowledge, its transfer to technology, and the impact of both on society. Citizenship science organizes science knowledge to correspond more directly to the need to make decisions in simple, personal, everyday situations (for example, choosing recyclable materials or using renewable sources of energy) and to take a stand and vote on large-scale economic and political issues (building highways or airports, protecting nature, preserving biodiversity, taxing the tobacco industry, subsidizing research on alternative energy sources or less-polluting technologies, and so forth). Other educational programs bring in even broader problems like sustainable development or the global consequences of air pollution. (See also Chapter Five.)

Skills for Democratic Thinking

Regarding the operational or procedural aspects of democratic thinking, it must be stressed again that thinking itself, without the adequate content, does not necessarily help one to make democratic decisions. Thinking has to be contextualized; it has to operate in the appropriate situations. Continuing in this vein, for democratic thinking to be practiced, the social context requires the use of certain skills. Although every thinking process may be relevant in a way, some skills are more directly related to democratic thinking than are others.

Critical thinking may be the form of thinking that has received the most scholarly attention in the past half century, and it is quite closely associated with citizenship education. Some cognitive scientists have considered it the thinking process most vital to citizenship because it helps one to evaluate every piece of information and, especially, to resist political manipulation and ideological indoctrination.[28] For a long time, and for the lay public in particular, critical thinking meant little more than a healthy skeptical attitude, a generally critical disposition toward everything. Those who aim at a more precise technical definition still sketch a very broad set of thinking skills that include a number of inductive and deductive processes. For example, Halpern contends:

> Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed—the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task. Other definitions include the notions that critical thinking is the formation of logical inferences . . . , the development of cohesive and logical reasoning patterns . . . , and careful and deliberate determination of whether to accept, reject, or suspend judgment.[29]

Perhaps the concepts connoted by "to accept, reject, or suspend judgment" are the most specific attributes of critical thinking, but these are still too general to make it easily identifiable. Recent research on cognition is more precise when identifying thinking skills relevant to processing information in social contexts. For example, categorization, generalization, probabilistic and correlational reasoning, logical operations (processing and comprehending the deep logical structures of verbal expressions), and causal inferences are among the skills that play an

important role in social cognition. Many of these have been studied by social psychologists for a long time. As Wilkes notes about thinking processes described as relevant in other areas,

> We can expect the same basic processes that were involved there to be equally central in social cognition. However, they are labeled differently. Categorization comes under the heading of social stereotyping; reasoning comes in the form of social attribution; and knowledge updating appears in various guises including impression formation, attitude change, and persuasion. The research parallels are real and substantial and they reflect large-scale borrowings by social psychologists from methods and explanations that were first developed in the cognitive laboratory.[30]

Nevertheless, the parallels between cognition in different domains need more and careful clarification. The role of situation and context also must be taken into account here, as Wilkes continues:

> The extent of this borrowing would seem to corroborate the widely held view that individually derived cognitive models can be adapted (with some local changes) to cover the full range of social cognitive phenomena. Perhaps so, but there are other, more radical opinions that have set out to unsettle or, indeed, sever this dependent relationship.[31]

Indeed, it is hard to suppose that stereotyping or forming prejudices can be considered simple cognitive problems or that negative social phenomena can be attributed to a lack of elaborated cognitive skills. If a child's bicycle is stolen and the thief turns out to belong to a minority or to another ethnic group, the negative judgment about the thief can easily be generalized to his or her entire group, and in this way to every other individual with the same particular characteristic, especially if there are more such cases in that particular group. Although it is easy to point out where the child in this example errs, where the logical mistake is in the inference, this is obviously not a pure reasoning mistake. We do not make such generalizations with green-eyed or brown-haired people—partly because green-eyed or brown-haired people usually are not perceived as groups, and partly because other information received from other sources also influences the thinking process. Hints received from the social environment suggesting how people may be categorized and how events may be interpreted affect or, in most cases, even substitute for our inferences. We rely on the simple explanations we receive from others rather than on

complicated logical inferences.[32] Therefore, it is clear that prejudices, chauvinism, and other antidemocratic behaviors cannot universally be overcome by shaping reasoning.

Still, a higher level of social understanding cannot be reached without the development of the underlying thinking mechanisms. For example, the control of variables plays an important role in cognition, as Piaget demonstrated in experiments involving simple mechanical tasks. Children learn to identify and separate variables and then determine their roles in a phenomenon. A naive thinker, for example, considers a pendulum to be a single entity. A step toward understanding why different pendulums swing with different tempos (the dependent variable) is to identify that the length of the string and the weight of the ball that hangs on it are two variables. Then, after guessing (hypothesis formation) and trying different settings (experimenting, hypothesis testing, and verification), the child learns that the length of the string in fact determines the pendulum's period of swinging. Social phenomena are much more complex than this, but understanding them requires basically similar mechanisms and insights. When thinking about a social phenomenon, such as law-breaking frequencies, one must separate variables such as ethnic group membership and socioeconomic status in order to identify their roles. Hands-on experiments in this case are excluded; the nature of this phenomenon is probabilistic rather than deterministic, and even if a child has already learned to control the variables in other contexts, this scheme cannot automatically be transferred to such a situation.

Poor reasoning skills block the development of democratic thinking and may hinder school education in its efforts to develop democratic character, especially in those cases when educational techniques assume, and their success requires, highly developed cognition. Someone who does not have the cognitive apparatus to process the presented information also lacks the alternative to form a cognitively understood model about the given phenomenon. If it does not provide children with the appropriate skills, education loses its means to shape or even influence children's moral development.

In teaching thinking, there are two main paradigms. One includes the stand-alone programs that attempt to teach thinking skills in separate courses. Although a plethora of such programs have been developed and implemented,[33] little evidence exists that they have long-term effects on intellectual development. As for teaching democratic thinking, separate courses may be useful, since there is a relevant knowledge base to think about (the content of social studies, civic education, citizenship education, philosophical and theoretical issues of democracy, and others). A good

example of this approach with significant implications for developing democratic character is Lipman's work, both his "Philosophy for Children" approach and his more general works on the possibilities of developing thinking.[34]

The other approach to teaching thinking, which marks a shift from direct instruction to more indirect ways of fostering development, is labeled in a number of ways, from the more technical terms *(integration, synthesis)* to the more visual ones that move the imagination, like *embedding, infusion,* or even *infiltration.* These approaches take into account that most of our thinking skills are context bound and do not transfer easily to new domains. Therefore, multiple access of skills and thinking processes can be ensured only if they are mastered in multiple contexts, that is, if the same or similar skills are practiced in several different situations. Recent publications propose that if we expect long-term effects, thinking should be taught in a number of different school subjects across the curriculum. This has led to the concept of the thinking curriculum, which suggests that relevant thinking skills should be taught in as many subjects as possible.[35]

The embedding technique, or teaching thinking within subject-matter areas, has already been implemented in several domains and for the improvement of several thinking skills and processes.[36] However, since designing such educational programs demands competencies from many different domains, and implementing them at school requires coordinated efforts, its full potential in school is still to be seen. So far, improvement efforts have been concentrated mostly on simple, easily identifiable thinking operations (for example, integrated science courses offer a good area for practicing such skills),[37] but there are promising attempts to expand the focus on thinking to cover the whole spectrum of school subjects.[38]

On asking them for the first time, the questions "How can democratic thinking be taught across the curriculum?" and "How can thinking operations relevant for democratic thinking be embedded in a number of school subjects?" sound a bit startling. Yet the opportunities to integrate democratic thinking and subject matter can be found in abundance. Although it may sound absurd, even mathematics lessons can be used for this purpose. For example, when proportion is taught, students may calculate the proportion of people with different ethnic backgrounds on the city council, in the state legislature, or in Congress and compare the results to their respective proportions in the local, state, or national population. Another example of proportional reasoning might be to compute the distribution of income in a country over several social groups.

The concept of probability and correlation can also be taught and contextualized with social examples. Through comparing proportions in

delinquency and income, students will understand not only mathematics but also something of the nature of correlational relationships in a social context. When students learn how to read multidimensional data tables, these tables may contain relevant social statistics; when they learn how to depict data on charts, they may depict, for example, the changes in the proportion of women attending college over a span of years, and so forth. With some comments and interpretation of the processed information, there is an authentic context to shape students' democratic thinking.

The sciences too offer a number of possibilities. For example, when students study carbon dioxide, they may learn about its impact on the environment and its contribution to the greenhouse effect and climate change. Although in many chemistry programs students already do this, they could go still further and study the figures of the carbon dioxide production of some countries, then compute per capita figures and compare them. In this way, they would also learn why studying chemistry is relevant, practice their proportional reasoning, and receive a moral message from the sphere of global environmental issues. Of course, exercises of this kind may take away some time from learning the core disciplinary knowledge, but what is learned in this way is learned better and for a longer and broader use.

Broader Contexts of Developing Democratic Thinking

The "learning for schools or for life?" dilemma is still alive. Since schools provide students with artificial environments, it is not obvious that school knowledge can be applied to real-life activities. Dewey described this problem as follows:

> As a consequence of the absence of the materials and occupations which generate real problems, the pupil's problems are not his; or, rather, they are his *only as* a pupil, not as a human being. Hence the lamentable waste in carrying over such expertness as is achieved in dealing with them to the affairs of life beyond the schoolroom. A pupil has a problem, but it is the problem of meeting the peculiar requirements set by the teacher. His problem becomes that of finding out what the teacher wants, what will satisfy the teacher in recitation and examination and outward deportment. Relationship to subject matter is no longer direct. The occasions and material of thought are not found in the arithmetic or the history or geography itself, but in skillfully adapting that material to the teacher's requirements. The pupil studies, but unconsciously to himself the objects of his study are the conventions and standards of the school system and school authority, not the nominal "studies." The

> thinking thus evoked is artificially one-sided at the best. At its worst, the problem of the pupil is not how to meet the requirements of school life, but how to *seem* to meet them—or, how to come near enough to meeting them to slide along without an undue amount of friction. The type of judgment formed by these devices is not a desirable addition to character.[39]

If school processes are so distant from the needs of students' optimal development in the more neutral teaching materials, they are even more so when a sensitive issue that shapes students' democratic thinking is considered. Taking another perspective, a developmental one, Torney-Purta writes when comparing experiences inside and outside school:

> Instructional experience in the classroom can be contrasted with developmental experience. Developmental experience is rich in levels of meaning and social context, in redundancy as the same topics are visited and revisited, in opportunities to respond to others' ideas and to get their feedback, and in chances to construct a group identity and to experience loyalty. Instructional experience in the social studies classroom is more likely to be narrowly focused on facts, lean on context and connection, moving rapidly among topics, lacking opportunities to voice opinions without risking potential censure, and to be generalized to reach all students rather than responsive to a group identity or set of interests. Developmental experience is situated for child and adolescent in a meaningful context, often within the peer group or family or neighborhood. Instructional experience usually lacks such a context.[40]

Because of the differences between schools and "real life," it is clear that schools alone will never be able to do a perfect job of providing students with socially relevant and usable knowledge. This problem is not new, but recently a number of radical and unrealistic alternatives—from deschooling society to home teaching—have been proposed to solve it. Nevertheless, in modern societies, there are hardly any other viable alternatives to mass education than public schooling. Public schooling can be made more "lifelike" in two major ways: by bringing as many real-life processes into school as possible and by extending educational processes beyond the walls of school by encompassing more outside experiences.

If we consider what kinds of social practices relevant to social activity and related to democratic thinking should be transferred into the school, collaborative processes will most definitely be among them. In today's societies, the number of workplaces in which members of a group col-

laborate in ways that involve the extensive exchange of information is significantly growing. Since democratic thinking is practiced in social situations, implementing educational processes that foster democratic thinking is not only socially relevant but also reflective of real life. For a number of reasons, in the early 1990s collaborative processes became among the most extensively studied areas in learning and instruction.[41]

Several instructional processes that foster democratic thinking have already become part of mainstream education. For example, cooperative learning, group projects, modeling, and role playing offer more possibilities for practicing democratic thinking skills than teacher-dominated, frontal classroom work.[42] Recently, a number of new and refreshing ideas have appeared that may reshape these educational practices. One of them is the concept of distributed cognition, which reconfirms social and collaborative aspects of accumulating knowledge.[43] When implemented in the classroom appropriately, it constitutes a realistic model of students' future life situations, as Brown and colleagues write:

> We argue that schools should be communities where students learn to learn. In this setting teachers should be models of intentional learning and self-motivated scholarship, both individual and collaborative. . . . If successful, graduates of such communities would be prepared as lifelong learners who have learned how to learn in many domains. We aim to produce a breed of "intelligent novices". . . , students who, although they may not possess the background knowledge needed in a new field, know how to go about gaining that knowledge. . . . Ideally, in a community of learners, teachers and students serve as role models not only as "owners" of some aspects of domain knowledge, but also as acquirers, users, and extenders of knowledge in the sustained, ongoing process of understanding.[44]

The search for authentic content and activities for school learning may never end because society—the "real life" outside school—is continuously changing. Conventional wisdom notwithstanding, research and school practice alike quickly reflect these rapid changes—sometimes too rapidly. For example, recent developments in computer and information technology find their place in the school in connecting collaborating students and make it possible, without any exaggeration, to distribute components of cognition over the globe.

Turning to the other possibility of bringing education closer to real life—that is, extending formal learning beyond the school walls—the roles of families, peer groups, and other communities must be taken into

account. The parts that communities play in education have recently been examined from a number of different perspectives.[45] Families and other communities outside school are often proposed as fertile fields for children's educational experiences, but they are not always the best examples for democratic practice. Therefore, studies that examine empirically how and under what circumstances family and community shape students' democratic thinking become particularly important.

In a series of both theoretically and methodologically sophisticated studies, Jacqueline Goodnow examined how people experience, interpret, and form expectations about household activities. The household work setting is the one that, for many children, offers the first context for thinking about some basic rules of a democratic community—for example, what each person should do in the home, what fairness means, how unpleasant chores should be shared, what incentives should be applied, how the work should be controlled and monitored, and how and when sanctions should be used. From these studies Goodnow created a general theoretical framework that, along with the methods devised in this context, can be applied to other work settings as well.[46]

Another study examined the developmental roots of the social contract in a cross-cultural comparative project in seven countries. As Flanagan and colleagues outlined the aims of the project, "Becoming a citizen, assuming the rights and responsibilities of membership in a social group, is a marker of attaining adult status in many societies. But what prepares people to assume those responsibilities? How do they come to understand and exercise their civic rights? What motivates them to become engaged in civil society?"[47]

Data collection took place in both industrialized countries with established democracies and countries from Eastern and Central Europe with political and economic systems still in transition. These settings offered insights into the differences in the development of civic identity that can be attributed to differences in the social environment as well as the consistent features that could be observed across countries. This survey also investigated how adolescents think about certain civic issues—for example, what importance they attribute to contributing to their communities, contributing to their society or country, helping the less fortunate, protecting the environment, and being active in politics. Interestingly, adolescents assigned the highest priority to environmental issues and then to their intentions to do something for their society or country. They attached low importance to political activism.

These studies in general also show the significance of family and immediate community in shaping students' democratic thinking. Nevertheless, for successful democratic thinking, all of the factors discussed in this chap-

ter have to work together smoothly: affective and cognitive attributes, processes and content of thinking, individual and collaborative processes, and within-school and outside-school experiences alike. Schools provide a unique opportunity to educate commonly, but to assume that they are sufficient for the challenge of developing democratic character in the young is to ignore the complexities of the task portrayed in this book.

Notes

1. Aristotle, *Nicomachean Ethics,* 1103a, trans. W. D. Ross, in Richard McKeon (ed.), *The Basic Works of Aristotle* (New York: Random House, 1941), p. 952.
2. Aristotle, *Nicomachean Ethics,* 1144b, p. 1035.
3. Aristotle, *Nicomachean Ethics,* 1144b, p. 1036.
4. Jean Piaget, *The Moral Judgment of the Child* (1932; New York: Free Press, 1965).
5. See, for example, Lawrence Kohlberg, "Moral Stages and Moralization: The Cognitive-Developmental Approach," in Lawrence Kohlberg (ed.), *Essays on Moral Development,* vol. 2, *The Psychology of Moral Development* (San Francisco: Harper & Row, 1984), pp. 170–205.
6. William Damon, "Early Conceptions of Positive Justice as Related to the Development of Logical Operations," *Child Development* 46 (June 1975): 301–312.
7. The influential book that is often referred to as "Bloom's Taxonomy" discussed the cognitive domain. It was first published in the mid-1950s and remained a major resource for developing curricula and designing tests until the late 1970s. See Benjamin S. Bloom, Max D. Englehart, Edward J. Furst, Walker H. Hill, and David R. Krathwohl (eds.), *Taxonomy of Educational Objectives: The Classification of Educational Goals,* Handbook 1: *Cognitive Domain* (New York: McKay, 1956). The taxonomy of the affective domain was not published until eight years later and had much less impact on educational practice. David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, *Taxonomy of Educational Objectives: The Classification of Educational Goals,* Handbook 2: *Affective Domain* (New York: McKay, 1964).
8. For a discussion of this issue, see, for example, David N. Perkins and Gavriel Salomon, "Are Cognitive Skills Context Bound?" *Educational Researcher* 18 (January–February 1989): 16–25.
9. William J. Clancey, *Situated Cognition: On Human Knowledge and Computer Representations* (Cambridge: Cambridge University Press, 1997), p. 1.

10. Stephen J. Ceci and Antonio Roazzi, "The Effects of Context on Cognition: Postcards from Brazil," in Robert J. Sternberg and Richard K. Wagner (eds.), *Mind in Context: Interactionist Perspectives on Human Intelligence* (Cambridge: Cambridge University Press, 1994), p. 82.
11. See Roger C. Schank and Robert P. Abelson, "Knowledge and Memory: The Real Story," in Robert S. Wyer (ed.), *Knowledge and Memory: The Real Story* (Hillsdale, N.J.: Erlbaum, 1995), pp. 1–85.
12. John H. Harvey and René Martin, "Celebrating the Story in Social Perception, Communication, and Behavior," in Wyer (ed.), *Knowledge and Memory,* p. 89.
13. Schank and Abelson, "Knowledge and Memory," p. 5.
14. John Dewey, *Democracy and Education: An Introduction to the Philosophy of Education* (1916; New York: Free Press, 1966), pp. 156–157.
15. This broader conception of democracy is elaborated in several of Goodlad and his coauthors' works. See, for example, John I. Goodlad, *In Praise of Education* (New York: Teachers College Press, 1997); and John I. Goodlad and Timothy J. McMannon (eds.), *The Public Purpose of Education and Schooling* (San Francisco: Jossey-Bass, 1997).
16. For an impressive account of the possibilities cognitive psychology offers to improve education, see Howard Gardner, *The Unschooled Mind: How Children Think and How Schools Should Teach* (New York: Basic Books, 1991). A more technical and systematic account is offered by Adrian F. Ashman and Robert N. Conway, *An Introduction to Cognitive Education: Theory and Applications* (New York: Routledge, 1997).
17. See, for example, Martha Stone Wiske (ed.), *Teaching for Understanding: Linking Research with Practice* (San Francisco: Jossey-Bass, 1997); and Tina Blythe and Associates, *The Teaching for Understanding Guide* (San Francisco: Jossey-Bass, 1997).
18. Walter C. Parker, "Curriculum for Democracy," in Roger Soder (ed.), *Democracy, Education, and the Schools* (San Francisco: Jossey-Bass, 1996), pp. 182–210.
19. Two of John Dewey's major works address cognition and democracy: *How We Think* (Boston: Heath, 1910), and "Thinking in Education," in *Democracy and Education* (New York: Macmillan, 1916).
20. For a review of current research in and new approaches to learning and teaching history, see Peter Seixas, "Conceptualizing the Growth of Historical Understanding," in David R. Olson, and Nancy Torrance (eds.), *The Handbook of Education and Human Development* (Cambridge, Mass.: Blackwell, 1996), pp. 765–783.

21. Judith Torney-Purta, "Dimensions of Adolescents' Reasoning About Political and Historical Issues: Ontological Switches, Developmental Processes, and Situated Learning," in Mario Carretero and James F. Voss (eds.), *Cognitive and Instructional Processes in History and the Social Sciences* (Hillsdale, N.J.: Erlbaum, 1994), p. 103.
22. Juan Delval, "Stages in the Child's Construction of Social Knowledge," in Carretero and Voss (eds.), *Cognitive and Instructional Processes,* p. 79.
23. See Adrian Furnham, "Young People's Understanding of Politics and Economics," in Carretero and Voss (eds.), *Cognitive and Instructional Processes,* pp. 17–47.
24. See Anna Emilia Berti, "Children's Understanding of the Concept of the State," in Carretero and Voss (eds.), *Cognitive and Instructional Processes,* pp. 49–75.
25. For an overview of this new orientation of science education, see Wolff-Michael Roth, *Authentic School Science* (Dordrecht, The Netherlands: Kluwer, 1995).
26. Programs for International Student Assessment, *Measuring Student Knowledge and Skills: A New Framework for Assessment* (Paris: Organization for Economic Cooperation and Development, 1999), p. 62. This document elaborates the conceptual foundations of the first assessment cycle.
27. Programs for International Student Assessment, *Measuring Student Knowledge and Skills,* pp. 62–63.
28. For a review of the history of critical thinking in American education, see Barbara Z. Presseisen, "Critical Thinking and Thinking Skills: State of the Art Definitions and Practice in Public Schools" (paper presented at the annual meeting of the American Educational Research Association, New Orleans, April 1994).
29. Diane F. Halpern, *Thought and Knowledge: An Introduction to Critical Thinking,* 3rd ed. (Mahwah, N.J.: Erlbaum, 1996), p. 5.
30. A. L. Wilkes, *Knowledge in Minds: Individual and Collective Processes in Cognition* (Hove, United Kingdom: Psychology Press, 1997), p. 299.
31. Wilkes, *Knowledge in Minds,* p. 299.
32. For a systematic discussion of cognition in social context, see Wilkes, *Knowledge in Minds.*
33. Costa published several volumes about American projects for teaching thinking. See Arthur L. Costa (ed.), *Developing Minds: A Resource Book for Teaching Thinking,* rev. ed., vol. 1 (Alexandria, Va.: Association for Supervision and Curriculum Development, 1991); Arthur L. Costa (ed.),

Developing Minds: Programs for Teaching Thinking, rev. ed., vol. 2 (Alexandria, Va.: Association for Supervision and Curriculum Development, 1991). For a similar collection of European programs, see J.H.M. Hamers and M. T. Overtoom (eds.), *Teaching Thinking in Europe: Inventory of European Programs* (Utrecht, The Netherlands: Sardes, 1997).

34. Matthew Lipman, *Thinking in Education* (Cambridge: Cambridge University Press, 1991).
35. See Lauren B. Resnick and Leopold E. Klopfer (eds.), *Toward the Thinking Curriculum: Current Cognitive Research* (Alexandria, Va.: Association for Supervision and Curriculum Development, 1989).
36. For a more elaborated overview and description of one of the techniques, see Benő Csapó, "Improving Thinking Through the Content of Teaching," in Johann H. M. Hamers, Johannes E. H. van Luit, and Benő Csapó (eds.), *Teaching and Learning Thinking Skills* (Lisse: Swets & Zeitlinger, 1999), pp. 37–62.
37. In this category, Cognitive Acceleration Through Science Education is one of the most impressive programs. See Philip Adey and Michael Shayer, *Really Raising Standards: Cognitive Intervention and Academic Achievement* (New York: Routledge, 1994).
38. See John T. Bruer, *Schools for Thought: A Science of Learning in the Classroom* (Cambridge, Mass.: MIT Press, 1993).
39. Dewey, *Democracy and Education,* p. 156.
40. Torney-Purta, "Dimensions of Adolescents' Reasoning," p. 118.
41. This change of emphasis, sometimes dubbed the sociocultural revolution, was partly a backlash against early cognitivism, which, according to some critics, was too mechanistic, reductionist, and individualistic. This new trend drew from the cultural-historical approach, social constructivism, and other Vigotskyan and neo-Vigotskyan theories. See, for example, Denis Newman, Peg Griffin, and Michael Cole, *The Construction Zone: Working for Cognitive Change in School* (Cambridge: Cambridge University Press, 1989).
42. A systematic discussion of using collaborative methods in a broad range of school subjects can be found in Mary Hamm and Dennis Adams, *The Collaborative Dimensions of Learning* (Norwood, N.J.: Ablex, 1992).
43. Cole and Engestrom outline the development of the notion of distributed cognition from the birth of psychology in Wundt's laboratory through the theories of Russian psychologists to the most recent computer applications. See Michael Cole and Yrjö Engeström, "A Cultural-Historical Approach to Distributed Cognition," in Gavriel Solomon (ed.), *Distributed Cognitions:*

Psychological and Educational Considerations (Cambridge: Cambridge University Press, 1993), pp. 1–46.

44. Ann L. Brown, Doris Ash, Martha Rutherford, Kathryn Nakagawa, Ann Gordon, and Joseph C. Campione, "Distributed Expertise in the Classroom," in Solomon (ed.), *Distributed Cognitions,* p. 190.

45. See, for example, Goodlad, *In Praise of Education;* Sudia Paloma McCaleb, *Building Communities of Learners: A Collaboration of Students, Families and Community* (Mahwah, N.J.: Erlbaum, 1997); and Paul Theobald, *Teaching the Commons: Place, Pride, and the Renewal of Community* (Boulder, Colo.: Westview, 1997).

46. Jacqueline J. Goodnow, "Collaborative Rules: How Are People Supposed to Work with One Another?" in Paul B. Baltes and Ursula M. Staudinger (eds.), *Interactive Minds: Life-Span Perspectives on the Social Foundation of Cognition* (Cambridge: Cambridge University Press, 1996), pp. 163–197.

47. Connie Flanagan, Britta Jonsson, Luba Botcheva, Benő Csapó, Jennifer Bowes, Peter Macek, Irina Averina, and Elena Sheblanova, "Adolescents and the 'Social Contract': Developmental Roots of Citizenship in Seven Countries," in Miranda Yates and James Youniss (eds.), *Roots of Civic Identity: International Perspectives on Community Service and Activism in Youth* (Cambridge: Cambridge University Press, 1999), p. 113.