

Cross-cultural research is like virtue—everybody is in favor of it, but there are widely differing views of what it is and ought to be.

N. Frijda and G. Jahoda

Culture & Thought

*a psychological
introduction*

Michael Cole & Sylvia Scribner

The Rockefeller University

John Wiley & Sons, Inc.
New York London Sydney Toronto

preface

Many years ago, at a conference on culture and cognition, Roger Brown observed that when graduate students were asked what they planned to study upon completion of their dissertations, a favorite response was that they would like to study how "someone else" (children, or cats, or some primitive peoples) would perform in the same task they had just labored over with college students. So it has been with cross-cultural research; curiosity about human variability, and often as not fortuitous location in an exotic setting, have provided the impetus for an ever-increasing number of studies, books, and specialized journals.

It was chance that brought each of us, separately, to research on culture and cognition. Yet each of us, in a continuing effort to broaden and deepen our understanding of the human mind, has been motivated to seek order in the chaotic flow of scholarly work that besets us.

This small book is intended to fulfill two purposes. We would like to introduce the beginning student to the variety of fascinating questions, phenomena, and theories that form the core of our understanding of culture and cognition. We also hope to influence the advanced student and professional who have, with good reason, looked with suspicion on the work that we discuss here. It is our belief that the proper use of comparative research designs can make a unique contribution to the study of human thought. This tool has been misused and poorly understood. In the chapters that follow we present some new approaches to the study of cultural influences on cognition. We hope that these formulations can serve as a basis for proper use and understanding of cross-cultural, psychological research.

New York 1973

*Michael Cole
Sylvia Scribner*

Copyright © 1974, by John Wiley & Sons, Inc.

All rights reserved. Published simultaneously in Canada.

No part of this book may be reproduced by any means, nor transmitted, nor translated into a machine language without the written permission of the publisher.

Library of Congress Cataloging in Publication Data

Cole, Michael, 1938-

Culture and thought: a psychological introduction.

Includes bibliographical references.

1. Cognition. 2. Personality and culture.

I. Scribner, Sylvia, 1923- joint author.

II. Title. [DNLM: 1. Cognition. 2. Cross-cultural comparison. 3. Culture. BF311 C689p 1974]

BF311.C558 155.9'2 73-16360

ISBN O-471-16478-X

ISBN O-471-16477-1 (pbk.)

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

contents

1. <i>Introductory Observations</i>	1
What Is Cognition	2
What Is Culture?	5
Summary	8
2. <i>A Brief History</i>	11
Cognitive Differences	12
<i>Biological Accounts</i>	13
<i>A Sociological Account</i>	19
<i>Psychological Accounts</i>	22
Cognitive Universals	25
<i>Anthropological Views</i>	25
<i>Linguistic Approaches</i>	27
<i>Psychological Approaches</i>	28
Culture and Cognition: A Synthesis?	30
Cognitive Capacities and Mental Tests	33
3. <i>Culture and Language</i>	39
Linguistic Relativity: The Whorfian Hypothesis	40
<i>The Lexicon</i>	42
<i>Grammar</i>	50
Linguistic Universality	55
Summary	59
4. <i>Culture and Perception</i>	61
Pictorial Depth Perception	64
Perception of Orientation	71
<i>Visual Illusions</i>	74
Perception and Attention: The Problem of Selection	80
<i>Binocular Rivalry</i>	81

<i>Perceptual-Cognitive Styles</i>	81
<i>Attribute Preference: Color, Form, Number, and Size</i>	90
Summary	94
5. <i>Culture and Conceptual Processes</i>	99
Bases for Classification	100
Classification and Reclassification	106
Generalizing Rules of Classification	108
Influence of Content on Classification	114
Separating Education from Other Cultural Variations	118
Summary	121
6. <i>Culture, Learning, and Memory</i>	123
Studies in Free Recall	126
Organizing and Other Memory Techniques	134
Summary	138
7. <i>Culture and Problem Solving</i>	141
Conservation	146
Inferential Combination	156
Verbal Logical Problems	160
Summary	168
8. <i>Culture and Cognition: trees in search of a forest</i>	171
Are Tests "Diagnostic" of Cognitive Capacities?	174
A Cross-Cultural Hypothesis	177
A Communication Experiment	178
Interpreting Failures to Communicate	179
From Negative to Positive: A Program of Research	184
<i>Analyzing the Experiment</i>	185
<i>Investigating Naturally Occurring Situations</i>	188
<i>Integrating Experiment and Observation</i>	189
Cognitive Differences	191
Cultural Differences	197
A Final Word: Experimenters and Their Points of View	200
References	203
Further Readings	213
Credits	217
Author Index	219
Subject Index	223

Culture
&
Thought
a psychological
introduction

chapter 1 *Introductory Observations*

This book is concerned with a very old and very general problem: Are the cognitive processes of people reared in different cultural settings different? And if so, how do they differ? Partly because of its generality, partly because of long-standing confusions about the nature of *culture* and *cognition*, and partly because of special problems involved in drawing inferences from data acquired on many levels of observation, no clearly adequate answer to this question exists at the present time.

It will be the purpose of this book to examine the roots of the difficulties encountered in attempts to answer the question: Are there cultural differences in cognitive processes? We will begin with an historical account of various scholarly approaches to this question. Our major emphasis, however, will be on a review and critical analysis of experimental studies carried out by psychologists in recent years. We hope not only to bring together some of the useful information that has been gathered, but to uncover ways in which our knowledge

about culture and cognition can be extended and applied to contemporary social problems.

What Is Cognition?

The first difficulty we face is the great variety of ways that terms referring to cognition—terms like *thinking* and *perceiving*—are used in everyday speech and in many areas of scientific discourse. We might get psychologists to agree on some neutral definition of cognition as those processes by which man acquires, transforms, and uses information about the world. But in actual practice, different psychologists use the term to denote different kinds of human operations on information, depending on their point of view in psychology and the specific nature of their research. Yet differences among psychologists are minor compared to those existing among investigators of dissimilar intellectual backgrounds. Anthropologists and philologists, as well as psychologists, have studied the relation between culture and cognition extensively, and each of these disciplines has developed its own working definition of *thinking* or has come to use the term in a variety of specialized ways.

In order to make our discussion of these conceptual confusions concrete, let us consider some of the evidence that scholars have used to demonstrate the existence of cultural differences in cognitive processes.

1. The Kamayura Indians of Brazil do not make a distinction between blue and green; spots of either color are designated by a single word, meaning parakeet colored (Werner, 1961, p. 284). This is taken as evidence that these people manifest a "diffuse conceptual construction" with respect to color concepts.

2. It has been observed in Western-style administrative courts in South Africa that native witnesses, when asked to account for some event, begin their accounts with some other event greatly preceding the critical event in time. For instance, if asked to tell about an accident that occurred at 5:00 P.M., the witness might begin his account by relating all of his experiences from the time he arose in the morning. Such observations led Bartlett (1932) to hypothesize that these natives had learned a particular way of remembering that required them to start at the beginning of any sequence in order to remember one of its later elements. This remembering process was said to be different from that of the ordinary Englishman.

3. In central Liberia, as well as many other parts of Africa, it is believed that certain men (variously called *zos*, *shamen*, and *witchdoctors*) can control lightning and direct it to hit anyone or anything they choose. As evidence of such powers, a college student from this region offered the following story: In his town there was an occasion upon which someone stole meat from the cooking pot of the lightning *zo*. Angered, the *zo* announced that if the meat was not returned immediately, he would direct lightning to hit the guilty person on the following Saturday. On the appointed day, the meat had not been returned and the people all took to their houses in fear; a storm blew up, and when it was over the people found a dead dog, apparently killed by lightning. The student, and all the townspeople, took the dog's death as *prima facie* evidence of the power of the *zo*.

4. Referring to a preliterate epic poet, Havelock (1963) has said "We can be misled by some of . . . [his] vocabulary into thinking that he can manage an abstraction. We draw this conclusion however only if we ignore syntactical context and concentrate on the word itself which is an improper method of evaluating its effect on the consciousness of the audience" (pp. 188–189).

The first example raises several important issues. Do the Kamayura Indians *see* colors differently from the way we do? Or is it merely that their language differs from ours in the way in which it labels parts of the color spectrum? Can we infer differences in the perceptual processes of people in two cultures from differences in their color vocabularies? Still further, can we make judgments about mental categories (concepts) on the basis of language categories, as Werner attempts to do in the quoted passage? Clearly this passage touches off many complex questions involving the relation of language to perception and thought, as well as the validity of using linguistic evidence to make inferences about perception and thought.

The example of African memory habits raises different questions and suggests several alternative interpretations. Perhaps a difference in memory processes is not involved. Perhaps all that is involved in the court case is a difference in the witness's interpretation of what he is supposed to do. The witness may consider events prior to that in question as important. Or he may be trying to indicate his lack of involvement by talking about side issues. These ambiguities cannot easily be resolved unless we move from the plane of observation to that of experimentation, setting up special situations in which the subject's memory habits can be investigated free of such doubts. But creating a special experimental situation does not end our difficulties; it simply provides a new

set. How representative is our experimental task? To what extent is it legitimate to argue from a single performance, or even a restricted set of performances, to performance-in-general within the culture? If our real interest is in the cognitive processes underlying performance, do we not require a representative set of performances from which to draw inferences?

The example of a belief in lightning magic illustrates still other ambiguities in the use of terms. Consider the different senses of the word *thinking* that might seem to apply to this example. If we were to try to compare our thinking about lightning magic with that of Liberians, we might say, "We don't think that a *zo* can direct lightning." In this statement, *think* is used in the general sense of *believe*. We are comparing our beliefs about human capabilities and weather phenomena with Liberian beliefs. We might also say after listening to the story, "We don't think that the *zo* made the lightning hit the dog," meaning that we do not conclude from what was told us that this event occurred—we are unconvinced by the evidence. Here *think* is used to refer to our evaluation of the relation between evidence and its implications. It is one thing to say that Liberians and American college students have different belief systems and may consequently make use of different evidence. It is another to say that the processes by which Liberians draw conclusions from evidence differ from ours, that we *reason* differently. This example indicates that we are going to have to be very careful to specify what we mean by *thinking* when we try to discuss data relevant to the question of culture and thinking, because our conclusions may very well depend upon our definitions: Are we referring to beliefs or processes? Is the question of logic relevant? Can one make inferences about logical processes from evidence about beliefs?

The final example is included because it raises some of the same issues as the other examples, with the additional feature that the person being discussed is one whose writings are read by almost every college student. Havelock is referring to Homer, the Greek epic poet. Homer's poems are among the great classics of world literature, yet his thought processes are said to differ fundamentally from ours. Homer, it is claimed, lacked the capacity for abstract thinking—an assertion commonly made about the thinking of people in nonindustrialized societies. Here we encounter another theme dominating many discussions of culture and cognition: the

idea that our thinking is not only reflected in the language we speak but is limited by that language. This idea is generally supported by citing evidence of *concreteness* or *abstraction* in the vocabulary and grammar of a language. Is there such a thing as a concrete or abstract language, and if so, what is its relation to abstract and concrete thought?

These are some of the questions that we want to bring to bear on the material amassed by anthropologists and psychologists. We are interested in finding out what has been learned about *how* people perceive the environment, *how* they classify it, *how* they think about it. Our concern, therefore, will always be to get beneath the performance shown in a particular situation to the psychological processes responsible for it. This will require us to scrutinize carefully the nature of the experimental task used by the investigator so that we have some idea of what kind of a performance we are dealing with, and to respect the ambiguities involved in drawing valid inferences from data.

What Is Culture?

If investigators have difficulty with the psychological concept of cognition, there is unhappily little less confusion over the anthropological concept of culture.

It might appear at first blush that there should be no problem in knowing that the people you are studying are members of a different culture, and in most cases this has been true. When Margaret Mead went off to live with the Manus people of New Guinea, she knew that she was observing Manus culture. The definitional problem arises when you ask the question: What features of Manus life make us aware that there is such a thing as Manus culture? Some seem obvious at first: the people all speak a particular language called Manus; they dress in a noticeably different way from Americans; they build their houses in a common and (to us) unusual way; they share common beliefs about the world and treat their children in a distinctive fashion. There is simply no question about it, they are Manus!

But which of these things are necessary to define *culture*? For example, we can speak of both a Spanish culture and a Peruvian culture even though a vast majority of people in both groups

speak the same language. We can speak of European culture in spite of large variations in dress, language, child-rearing practices, and religious beliefs among the people on the continent.

These kinds of considerations have led many scholars to deemphasize the quest for a universally acceptable definition of "what culture really is." Instead attention is drawn to some range of social phenomena that appears important for the purpose at hand. E. B. Tylor (1871), for example, felt that the anthropologist's job was like that of a naturalist: his business was to classify details of culture "with a view to making out their distribution in geography and history and the relations which exist among them." This aim is reflected in his famous definition that treats culture as an inventory of discrete, equally important phenomena or, in his words, a complex "which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society" (1871, p. 1).

Tylor's contemporary, Lewis Morgan, was interested in another enterprise. To Morgan, the challenging problem in culture study was to trace the progression of human society from one stage of organization to the next, each characterized by an increase in man's conscious control of nature. Thus he selected for emphasis certain aspects of social life that most clearly revealed the principle stages of human development. These included the arts of subsistence, which he felt provided the motor force of cultural advance, and primary institutions such as government, the family, and property. His major work, *Ancient Society* (1877), deals with the origin and development of these factors, leaving untouched other features of culture dealt with by Tylor. Concerned with accounting for culture *change*, Morgan nowhere defines (in *Ancient Society*) what culture *is*.

These different anthropological definitions of culture illustrate the difficulties investigators encounter when they try to relate phenomena on a cultural level to those on an individual psychological level. Which particular aspects of culture should be singled out as potentially important from the causal point of view? Some guiding hypotheses are clearly essential if investigations are not to proceed on a hit-and-miss basis. But as yet there is no general theory or conceptual framework in psychology that would generate specific hypotheses about how culturally patterned experi-

ences influence the development of cognitive processes in the individual.

In the absence of such guidelines, psychologists in the early period of cross-cultural work depended on obvious distinctions between populations (say aborigines and Englishmen) to sustain their comparative studies. Global comparisons of this kind, however, proved singularly unenlightening. If almost everything about the way of life of two groups is different, what can we learn about causation by demonstrating a difference in performance on a single task?

This tendency to compare cultures as though they were homogeneous units that could be lined up against each other has diminished in recent years. Investigators have singled out a certain few sociocultural factors as potential causal mechanisms for specific phenomena. Among these have been language, urbanization, formal educational institutions, and literacy. In addition, ecological features such as the nature of the landscape (jungle versus arctic expanse) and economic factors such as subsistence activities (hunting versus planting) have figured in psychological explanations. While this search for factors that can make a difference *within* cultures as well as *between* cultures is certainly an advance, it still has serious drawbacks. For one thing, it suggests rather simple connections between culture and cognition; in reality, cultural features rarely operate in isolation. For example, many anthropologists have speculated that literacy is a crucial factor in changing the way people think. But, except in rare cases, literacy co-occurs with other cultural features such as the presence of formal education, increased industrialization, and urbanization. When we find, as many have, that educated and uneducated rural Africans differ in their performance of some cognitive task, how are we to say what features of their cultures caused the difference? Furthermore, simply showing a relation between some aspect of culture and some aspect of individual performance does not tell us anything about the nature of the connection between them; yet that is precisely the psychologist's interest.

One final word about some of the conceptual difficulties in this field. When we talk about a relation between culture and cognition, it might appear that we are dealing with two separate sets of phenomena that make contact with each other under special

circumstances, which it is the scientist's task to discover (something like two billiard balls colliding on a pool table). But just as it is fanciful to conceive of man existing outside of social life, we cannot imagine any intellectual function that does not have a sociocultural character. Perception, memory, and thinking all develop as part of the general socialization of a child and are inseparably bound up with the patterns of activity, communication, and social relations into which he enters. The very physical environment that he encounters has been transformed by human effort. His every experience has been shaped by the culture of which he is a member and is infused with socially defined meanings and emotions. Consider language, for example. It is at one and the same time a vital social force and an individual tool of communication and thought; it is, so to speak, on both sides of the culture-cognition relationship.

How can we handle these complexities? What this book will try to demonstrate is that we can not hope to escape from these complexities by setting up, as a criterion, a hypothetical individual with cognitive capacities that are free from the influences of culture. The "isolated individual" is a myth. Nor can we hope to measure cognitive capacities by means of some idealized test that is itself culture-free. We would delude ourselves if we thought such a test were possible. Instead we have to discover a strategy of research that will help us uncover how individual and cultural processes interweave with each other as the child develops and becomes integrated into society. And that is the subject matter of this book.

Summary

It should be clear from this brief discussion that the study of culture and cognition is a very diffuse enterprise. The idea of employing variations in cultural experience to decide basic questions about the nature of human nature is very attractive. But scholars have failed to arrive at any general consensus about how to proceed. Instead we have a situation in which each investigator starts from his own basic assumptions and proceeds by means of his own data-gathering techniques. The range of phenomena and the variety of explanations that a hundred years of such unco-

ordinated scholarly activity has produced are immense. They cover not only the multitude of theories and experimental situations that are common to the broad field of cognitive psychology, but problems of anthropology and linguistics as well.

In the light of this diversity, complete coverage of the "facts" about culture and cognition is not only a difficult undertaking, but one likely to be incoherent and unenlightening. Within certain very prescribed areas experiments have led to reasonable and useful generalizations. As a rule, however, investigators have not pursued any single line of work long enough to bring the issues at stake to a clear resolution. Consequently, it is necessary to patch together evidence from an often-bewildering array of cultures and techniques in order to illuminate any specific culture-cognition relation (as, for example, the relation between literacy and memory). This makes both the writers' job of exposition and the readers' job of interpretation quite difficult. It will often seem, in the chapters to follow, that the experiments reviewed are totally unrelated, like multicolored chips in a kaleidoscope. This situation should be recognized for what it is, a deficiency characteristic of current scholarship, and not a deficiency in the reader's conceptual capacities.

The material we have selected for discussion does, however, represent some rules of selection. While we will refer from time to time to other fields of research, our main emphasis will be primarily *experimental* in nature, not purely out of methodological bias but because there has been little psychological work on cognitive processes employing observational or quasi-experimental methods. Our survey is by no means complete, nor is it intended to be; its purpose is to provide the reader with a grasp of major questions and investigative techniques.

In an attempt to bring some order out of chaos, we have organized the chapters that follow according to relatively traditional categories currently used in cognitive psychology. At the end of each chapter, we provide a summary of the work within that particular problem area. In the final chapter we return to the broader issues raised here and attempt to integrate concepts and phenomena that have customarily been dealt with on an isolated basis.

chapter 2 *A Brief History*

Much of the history of research on culture and cognition has been dominated by the controversy between those who maintain that there are no fundamental differences in human thinking across cultures and others who insist that such differences are critical to an understanding of man's nature.

More recently, these sweeping generalities about universal characteristics of man have tended to be replaced by questions concerning how specific cultural differences might be related to specific cognitive differences. It is useful, however, to review the principal positions in the earlier controversies and to evaluate the evidence and procedures upon which they rested. Examining classic theories can help us understand some of the lines of investigation now pursued in cross-cultural studies. While many current studies disavow theoretical frameworks and seem to focus on specialized issues, their assumptions often show continuity with earlier approaches.

Reexamining these approaches in the light of contemporary research may suggest new

and more valuable ways of raising questions about the relation between culture and cognition.

But this is by no means an easy task. So great has been the intellectual challenge posed by these questions that scholars and scientists from many disciplines have attempted to grapple with them. Over the centuries, sociologists, anthropologists, philosophers, linguists, and psychologists have all put forward theories linking culture and mind. These theories have been in the grand tradition and deal with fundamental philosophic and scientific concepts. In a brief review, we cannot begin to deal adequately with this theoretical spectrum nor, for that matter, with any one of the major controversies that have developed within it. What we hope to do is give the reader a glimpse of this area from the heights—in its broadest and most panoramic perspective—and to introduce the great thinkers whose views still provide the silent framework within which most contemporary research takes place.

Cognitive Differences

The history of concern with cultural influences on thinking begins with an emphasis on differences.

It is not surprising that the adventurers and missionaries from western European societies of the sixteenth to eighteenth centuries should have been struck by the novel and unexpected characteristics of the life they encountered on new shores. Their observations and records featured aspects of behavior and social customs dramatically unlike those they knew at home. In their astounded discovery of the great diversity that characterizes humanity, they frequently overlooked those common aspects of social life that unify it (the existence of language, tools, family units, systems of morality and ideology, for example). Some even doubted that "those people" were "really human."

The voluminous records that travelers and colonial administrators left behind provided the basic source material for the new sciences that arose in the mid-nineteenth century. Scholars took their scientific problem to be one of accounting for the exotic facts reported in the informally accumulated ethnological literature. How could cultural differences be characterized and ex-

plained? Were they a consequence of innate differences among human groups, especially differences in mental faculties, or did human groups appear different only because their cultures were different?

This almost exclusive preoccupation with cultural differences was further reinforced by the dominant economic and political forces of the time. Contacts with nonindustrialized societies did not long remain sporadic and incidental. By 1850 England and other European nations had met and conquered traditional, non-technological societies on all the continents and had built extensive empires. Practical problems of administration called for the talents not only of military men and public officials, but of the new social scientists as well. Under such circumstances, concern with cultural differences all too often took the form of comparisons between "them" (the "uncivilized" in the colonies) and "us" (the "civilized" in the mother countries).*

Biological Accounts

One of the earliest and most influential theoretical schemes for relating mental and cultural phenomena was put forward by Herbert Spencer, a leading figure in English scientific and intellectual circles in the decades from 1850 to 1900. Spencer's life work was devoted to the construction of a *synthetic philosophy*, which he hoped would unify knowledge of the separate sciences. He thought that all the phenomena studied in the separate sciences could be explained by elementary laws of matter and motion. A number of years before the publication of Darwin's *Origin of Species*, Spencer had already begun to account for the history of all concrete things in the universe in terms of a single cosmic principle of evolution, which he thought regulated matter in motion.

According to Spencer, all things in the world—inorganic, organic, and superorganic—change over time in a definite direction. Simple forms that are initially homogeneous become more complex and heterogeneous. Their parts become increasingly differ-

*The terminology used in the works under review does not reflect modern usage, but for simplicity's sake we will retain the author's original terms in our exposition of their views. The reader should supply the quotation marks for such terms as "primitive," "uncivilized," "savage," and the like.

entiated; but at the same time they become better integrated and organized into superordinate and subordinate levels. The movement of evolution is from lower to higher, and more perfect, organization.

Shortly after Darwin demonstrated how evolutionary mechanisms operate in the biological world, Spencer attempted to show how the same principles regulated development in the psychological and social domains. He maintained that intellectual progress can be understood by the evolution of more-complex and more-general cognitions from simple cognitions and reflex actions, just as complex physical structures and functions evolve from simple ones. Similarly, society can be thought of as an organism, and its products—language, knowledge, material appliances, and arts—as becoming progressively more complex and highly organized (1888, Vol. 1).

While Spencer did not reduce psychological and social phenomena to biological phenomena, he resorted to biological mechanisms to account for their origin and the course of their development. He relied chiefly on the concepts of natural selection or survival of the fittest (which he credited Darwin with elaborating) and on the inheritance of acquired traits (the central tenet in the evolutionary theory of the biologist Lamarck). How did these concepts apply to mental phenomena? Spencer held that during the course of man's experience, he acquires certain mental traits that favor his continued existence and are passed down from generation to generation.

The effects of the most uniform and frequent of these experiences have been successively bequeathed . . . and have slowly amounted to that high intelligence which lies latent in the brain of the infant—which the infant in after life exercises and perhaps strengthens or further complicates, and which with minute additions, it bequeathes to future generations. . . . Thus it happens that out of savages unable to count up to the number of their fingers and speaking a language containing only nouns and verbs, arise at length our Newtons and Shakespeares (Spencer, 1887, p. 471).

And what were Spencer's ideas about social evolution? Through the interplay between the nature of individuals in a social aggregate and external environmental forces (such as climate and plant life), societies develop more-varied and more-elaborate structures and products. Those people who more readily acquire higher

physical and mental traits make the greatest social advances. Reciprocally, those who live in the most developed societies have experiences that further promote their intellectual faculties. Thus: "Development of the higher intellectual faculties has gone on *pari passu* with social advance, alike as cause and consequence" (Spencer, 1888, pp. 90–91).

As the mental traits and social environments of different peoples of the world diverge, the struggle for survival sets one group into conflict with another, by means of which the more powerful or "more adapted" drive "inferior varieties into undesirable habitats" and occasionally "exterminate them" (Spencer, 1888, p. 39). Since those who win are the more-adapted, Spencer's theory led to the conclusion that nineteenth-century Englishmen were of the highest mentality and lived in the most advanced society, representing a standard against which other people could be measured. Study of existing races at lower social levels, Spencer then argued, could show the mental traits that characterized early evolutionary forms of human life.

Two aspects of Spencer's analysis of the intellect of non-Western peoples are of special interest—his method of discovery, and his catalogue of mental traits. Spencer described his method of discovering evolutionary sequences as composed of two stages. First he deduced the leading traits of intellectual evolution from current psychological principles. Then he used the facts as described by travelers to demonstrate how the principles applied (1888, Vol. I). Although he brought an enormous amount of material to bear on this enterprise (over 2500 references in 455 works), almost all of it was unevaluated and anecdotal. Moreover, since this highly selective material was filtered through Spencer's theory of evolution, it is not too surprising that the facts that emerged as significant tended to fit the theory. As we shall see, this method continues to be employed as an investigative tool in the study of culture and cognition, even though some of its practitioners have conceptual frameworks quite different from Spencer's.

As for the mental traits Spencer enumerated, many of these, too, persist in the contemporary literature. Primitive thinking was said to exhibit the following "deficiencies," among others: no conception of general facts, no ability to anticipate future results, limited concepts, absence of abstract ideas, lack of idea of causality. On the other hand, the uncivilized have "acute senses and

quick perceptions." They are imitative and "clever, rapid learners of simple ideas [but] incapable of taking in complex ideas. The primitive intellect develops rapidly and early reaches its limit" (Spencer, 1888).

Spencer's views were held in varying measure by the vast majority of scholars until the turn of the century. Within the general context of evolutionary theory, anthropologists and psychologists gave scientific respectability to a number of propositions promulgated by Spencer and popularly disseminated. One of these was the notion that primitives think like children. For example, E. B. Tylor, called by some the father of anthropology, viewed the imagination of nonliterate people as similar to that of European children. The observations that suggested this analogy were doll play in young children and a custom in some societies for mothers to carry around dolls of their dead children with the presumed purpose of warding off harmful spirits that might attack living children. Tylor states:

The idol answers to the savage in one province of thought the same purpose that its analogue, the doll, does to the child. It enables him to give a definite existence and a personality to the vague ideas of higher beings, which his mind can hardly grasp without material aid (1865, p. 94).

One of the founders of developmental psychology in the United States, G. Stanley Hall, used a somewhat different theoretical framework to support this general line of thought. He was a strong supporter of the view that "ontogeny recapitulates phylogeny"—a famous aphorism by which was meant that the child's development goes through the same stages as the human race has traversed in its evolutionary development. This idea, taken over from biology, made it easy to accept the evidence concerning the "childlike" thought processes of primitive people as support for the general doctrine of *recapitulation*. Just as each child undergoes mental development, so does the race, the two processes being in fact the same. "Infancy, childhood and youth," said Hall, are from one point of view, "three bunches of keys to unlock the past history of the race" (1965, p. 47).

The flavor of this approach is contained in the following excerpt from the work of one of Hall's students.

The mind of the child and the mind of the savage, when differences due to the presence of manhood and womanhood in the latter,

diversity of environment, influence of higher culture, prolonged infancy, social environment, etc., have been taken into consideration, present many interesting parallels of a general sort. *Naivete* that touches upon genius, suggestibility of great extent and sometimes of a very high order, resemblances in mental association, modes of thought and of thought-expression, dream-life, mind-content, initiation, conservatism, mythological ideas, personal and social ideas, sense-domination, love of analogy and symbolism, use and products of the imagination, love of nature and the world of plant and animal life, poetry and story-telling, myth-making, personification and other primal arts, language, art, music, etc. (Chamberlain, 1901, p. 456).

The prevailing biological orientation of the period was also expressed in the ubiquitous identification of cultural differences with racial differences. Spencer not only attributed lower mental traits to "inferior" races but to lower socioeconomic classes within the industrialized nations, who, he presumed, had taken their place in society by natural selection. While the identification of races varied enormously from one work to another, most nineteenth-century classifications shared with Spencer's the common feature of putting European society at the top of the evolutionary ladder (see Harris, 1968, Chap. 5). Tylor found it convenient to divide the human race by language families (Semitic, Aryan, and the like). While he held that stages of culture might be compared without taking into account "hereditary varieties of races," he was not averse to arranging the races on a rough scale of civilization. In doing this, he acknowledged that the "white invader or colonist . . . at best can hardly claim to substitute a life stronger, nobler, and purer at every point than that which he supersedes" (Tylor, 1871, p. 29), but he concluded nevertheless that "the general tenour of the evidence goes far to justify the view that on the whole the civilized man is not only wiser and more capable than the savage, but also better and happier" (1871, p. 31).

The anthropologist Marvin Harris has aptly characterized the historical role of doctrines of racial determinism in the social sciences. Observing that popular systems of prejudice are probably as old as humanity, he points out that the nascent social sciences put them on a new footing: "Prior to the 19th century, nations had never rewarded their wise men to prove that the supremacy of one people over another was the inevitable outcome of the biological laws of the universe" (Harris, 1968, p. 81).

About the turn of the century the climate of scientific theory began to change, and the racially based evolutionary theory of cognitive processes fell into disrepute. The biological hypothesis of the inheritance of acquired traits—on which Spencer placed great reliance for his entire theory of mental evolution—has become scientifically unacceptable with respect to the transmission of physical traits, let alone complex intellectual behaviors. No one today would seriously maintain that “mental peculiarities” caused by habit become organic and hereditary.

Moreover, the social sciences have amassed compelling evidence that the complex behavioral changes Spencer conceived of as biologically transmitted are acquired through experience and are culturally transmitted. A Chinese infant raised in France grows up to speak French, and the son of a tribal chief presumably genetically incapable of abstract reasoning attends English schools and becomes a Don at Oxford.

As for social evolution, the rapid changes in power relations among nations and in social groups within nations in this century make it difficult to resort to the slow processes of natural selection to account for social change. There is general agreement within the social sciences today that the principles that govern societal change are not the same as those that govern the development of species.

The classic attack on the identification of race with culture was made by Franz Boas in *The Mind of Primitive Man* more than fifty years ago. At the end of a long survey of the historical antecedents of modern societies, Boas reached the conclusion, ascribed to by the overwhelming majority of scholars, that there is no foundation for the equation of race and culture. Language families are independent of race as defined by any simple or single set of physical characteristics. Cultural forms differ among people classified as the same race (Peruvian Indians compared with northern Canadian Indians, for example). Moreover, history shows numerous examples of extensive changes in language and culture without corresponding changes in “blood.” The two major examples cited by Boas are Europe in the Middle Ages and Japan in the modern era. Boas further illustrated the shifting, nonscientific nature of the race concept by reviewing various attempts at racial classification which have proceeded in the main by a hodgepodge of various

and overlapping criteria—such as a mixture of geography and anatomy or of language and hair color (Boas, 1911).

Contemporary social and biological scientists have made even more thoroughgoing critiques of the position that genetically based racial differences account for cultural differences. While genetic specialties probably contributed to man’s evolution from hominid to *homo sapiens* over the course of 2 million years, the modern consensus is that the rapid cultural advances of *homo sapiens* in its lifetime of approximately 50,000 years have little to do with genetic changes (see Harris, 1968). The overwhelming evidence that radical changes in culture can and do occur within the space of one generation without the possibility of genetic innovation makes it clear that the concept of *genetic transmission* is inapplicable as an explanation of cultural change.

Secondly, it has proved impossible to arrive at a scientific definition of subspecies within the human race and, accordingly, impossible to compare cognitive functioning or other behavioral characteristics along racial lines. (See Topoff, in press, for a lucid discussion of the status of the race concept). The persistence of the concept of race as a descriptive or explanatory construct despite failure to achieve a consensus on the defining attributes of races, suggests that the concept has a firmer sociological than biological base. As Herskovits pointed out in a recent reassessment of Boas’s contribution, anthropological developments and world events in the last several decades have converged towards the conclusion that “the very concept of race [represents] a scientific dead-end” in the explanation of culture (Herskovits, 1965, p. 10).

A Sociological Account

The view that the thought processes of nonindustrial peoples are radically different from those of Europeans had another set of roots in addition to those found in evolutionary theory. This was the tradition of French sociology at the turn of the century, which, in the work of Comte, Durkheim, and others, stressed the critical role of the social collectivity in determining the characteristics and behavior of the individual. Lucien Levy-Bruhl, a friend of Durkheim, set out to analyze mental functioning from this

Worm
summers

point of view. Beginning in 1910, he published a series of monographs about primitive mentality; like Spencer, he relied exclusively on the published reports of missionaries, travelers, and early anthropological observers.

Levy-Bruhl maintained that the proper way to study individual mental functioning is through an analysis of the culture of which the individual is a member. He held that each culture may be characterized by a set of general beliefs, called "collective representations," which regulate the thought processes of the individuals in that group. The collective representations of the average European keep the intellectual, motor, and emotional realms distinct from each other. But the collective representations of primitives do not.

Their [primitive] mental activity is too little differentiated for it to be possible to consider ideas or images of objects by themselves apart from the emotions which evoke those ideas or are evoked by them (1910, p. 23).

Levy-Bruhl claimed also that primitive mentality was "prelogical," by which he meant that "it does not bind itself down, as our thought does, to avoiding contradiction" (1910, p. 63).

These views met with strong and continuing disapproval from American scholars, among whom Boas was an early spokesman. In the same work in which he challenged racial interpretations of cultural differences, Boas attacked the evidence and methods used by Levy-Bruhl and others to "prove" differences in cognitive processes among cultural groups. First, he challenged the reliability of some of the ethnographic reports used as source material. As an example, one observer cited by both Spencer and Levy-Bruhl had concluded, on the basis of the fact that certain Indians quickly grew tired of conversation with him, that the "mind of the savage appears to rock to and fro out of mere weakness." But Boas had worked with the Indians in question and could testify that they generally manifested a lively interest in discussion and debate. If they failed to participate in the conversation, he claimed, it was probably because the traveler was boring them to death with trivia. In the same vein, would we be justified in concluding that college students have no capacity for abstract ideas because they doze off during a boring lecture? *Yes!*

Secondly, Boas challenged the whole idea that one can draw

inferences about thought processes from the traditional beliefs and customs of a people. He pointed out that were we to use traditional American beliefs about nature and society as evidence about logical processes, the conclusions would be as dismal as those drawn about natives' logic. This criticism has proved very important in the history of studies of culture and thinking because it invalidates the major source of data upon which scholars had previously rested their conclusions.

A further criticism of Levy-Bruhl made by contemporary anthropologists goes to the question, raised earlier in regard to Spencer's method, of the bias and selectivity involved in the culling of facts from the literature.

It is in the use of sources that Levy-Bruhl is most vulnerable. Every anthropologist knows that one can construct almost any kind of theory and find cases to support it in the ethnographic literature. . . . Any theoretical statement remains a suggestive hypothesis until the dynamic connections have been documented by controlled research (Bunzel, 1966, p. xvi).

With few exceptions, psychologists also have been antagonistic to Levy-Bruhl's writings. Wolfgang Köhler, noted Gestalt psychologist, offered an alternative explanation for some of the phenomena Levy-Bruhl took as instances of mystical thinking. He illustrated in detail how certain dynamic principles of *perception* identified in Western cultures might account for so-called animistic beliefs in traditional cultures, making it unnecessary to hypothesize differences in *thought* processes. He went on to suggest that primitive perception might in fact be closer to reality than the modern view, in which people have learned to "see the world" through the eyeglasses of natural science (Köhler, 1961).

The English psychologist Sir Frederick Bartlett considered Levy-Bruhl's major fallacy to be his comparison of primitive thought with scientific thought. Bartlett maintained that if the ordinary members of both primitive and modern societies were compared, their mental functioning would reveal common characteristics.

The error here, as in much recent social and abnormal psychology, is not that the primitive or the abnormal are wrongly observed, but that the modern and normal are hardly observed at all. . . . If we care to turn our attention to the practical inventiveness of primitive man in regard to the search for food, the provision of dwellings, and the development of material arts, it appears that he

is as capable of learning from experience as the most cultivated of our contemporaries. Moreover, within these realms he learns from experience in exactly the same ways as we do (Bartlett, 1923, pp. 284–285).

Psychological Accounts

The work of the developmental psychologist Heinz Werner contains a characterization of non-Western thought with echos of Spencer and Levy-Bruhl (Werner, 1957; see also Werner and Kaplan, 1956, and Werner, 1961). Werner shares with the early evolutionary theorists an interest in *changes* that occur in mental functioning across species and within the human species. He finds such changes to be orderly and directional, as they did; but he does not seek to account for them by biological mechanisms, nor does he use social phenomena, such as Levy-Bruhl's collective representations, for explanatory purposes. Rather, he appeals to the general concept of development, which "rests on one basic assumption, namely that wherever there is life, there is growth and development, that is, formation in terms of systematic orderly sequence" (Werner, 1957, p. 125). The developmental approach has been useful in systematizing biological phenomena in various fields, he states, and can similarly "coordinate within a single framework forms of behavior observed in comparative animal psychology, in child psychology, in psychopathology, in ethnopsychology, and in the general and differential psychology of man in our own culture" (1957, p. 125).

Development in all these forms of life is, according to Werner, regulated by the *orthogenetic principle*—wherever development occurs, it proceeds from a state of relative lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration (Werner and Kaplan, 1956). (Compare Spencer's formulation of the course of evolution on p. 13). Werner is careful to point out that, unlike G. Stanley Hall and other recapitulationists, he does not treat developmental sequences in animals, children, and cultures as *materially identical* but only as similar or parallel. Nonetheless, when he uses the term *primitive mental activities*, he refers to forms of thought that are presumably present in certain animals, in children in Western cultures, in adults as well as children in non-Western cultures, and in Western mental

patients who have regressed to earlier levels of development.

According to Werner, *nonliterate* people, children, and mental patients all manifest primitive thinking in such spheres as the following: failure to differentiate between subject and object (as not knowing the difference "between what one dreams and what one sees"); use of concrete modes of classification; failure to separate thought processes from perceptions, emotions, and motor actions, and thus failure to achieve an abstract mode of thought. While Werner draws on experimental findings, including his own experimental work, for his conclusions in respect to animals, children, and psychopaths, his generalizations concerning primitive man rely on pretty much the same material and procedures used by Levy-Bruhl. His comparative approach is illustrated in the following excerpts from *Comparative Psychology of Mental Development* (1961):

It appears that grouping on the basis of perceptual configuration is reflected in the classificatory phenomena of *primitive languages* [italicized in the original]. One peculiarity of these languages is that the verbal classification of several single objects by means of one name common to all is not always dependent on any actual common likeness (p. 225).

This primitive type of classification based on a togetherness of different things in a realistic situation can be clearly observed in the early ontogenetic stages of *child language*. Lombroso reports one child who designated both duck and water by "qua-qua." Another used "afta" to mean drinking-glass, pane of glass, windows and also what was drunk out of the glass (p. 226).

It is especially instructive to observe that a concrete naturalistic grouping appears in the *pathologically* regressed mentality. A cataleptic woman created a language that exhibits a most extraordinary method of word construction. She completed a whole dictionary of normal terms translated into her own private language. Instead of the word "thistle," for example, she used "le stone" (with the French article). The verbal identification of "thistle" and "stone" depends on the fact that they both belong to the same (affectively conditioned) collective situation and are therefore interchangeable (p. 228).

Werner's views have led to little cross-cultural research, but some recent findings, especially in the areas of perception and classification reviewed in later chapters, are helpful in evaluating it.

A general problem with Werner's orthogenetic principle is that it *describes* developmental levels of organization but suggests no

mechanisms by which development proceeds from one level to another. The notion that development is a natural genetic process cannot elucidate the specific relation between cultural experience and cognition. Why should one level be reached in one culture and not in others?

Jerome Bruner, an American psychologist well known for his studies of perceptual and cognitive processes, has applied himself to this question and has attempted to work out a theory linking particular aspects of culture to cognitive growth. Intelligence, according to Bruner, is to a great extent the internalization of "tools" provided by a given culture, including not only technological hardware but symbolic systems as well. Cultures may differ in their repertoire of tools and in the social institutions that they develop for the transmission of knowledge and tool-using skills. Among institutions having the greatest impact on cognitive growth is the Western-type school, which structures learning experiences in a unique way. In school, learning is separated from everyday practical activities, language is used out of context for special analytic purposes, and the new tool of written language is made available for cognitive operations. School learning thus demands, and fosters, abstract modes of thought.

Unlike others whose work has been discussed so far, Bruner has based his theorizing on data gathered from psychological experimentation in other cultures rather than on surveys of the anthropological literature. In a study conducted among the Wolof tribe in Senegal, West Africa (reviewed in Chapter 6), the performance of Wolof schoolchildren on a concept-formation task was more like that of middle-class schoolchildren in Boston than like their unschooled neighbors. This and other findings led Bruner to conclude that if school-type intellectual training is not forthcoming,

then one finds forms of intellectual functioning that are adequate for concrete tasks but not so for matters involving abstract conception. . . . In short, some environments "push" cognitive growth better, earlier and longer than others. What does not seem to happen is that different cultures produce completely divergent and unrelated modes of thought. The reason for this must be the constraint of our biological heritage. That heritage makes it possible for man to reach a form of intellectual maturity that is capable of elaborating a highly technical society. Less demanding societies—less demanding intellectually—do not produce so much symbolic embed-

ding and elaboration of first ways of looking and thinking. Whether one wishes to "judge" these differences on some universal human scale as favoring an intellectually more evolved man is a matter of one's values (Greenfield and Bruner, 1969, p. 654).

This contemporary view of cognitive differences is a long way from the earlier anthropological contrasts between two kinds of mentality, which were described as bipolar opposites—all the essential aspects of the one presumably missing from the other. In Bruner's view, whatever cognitive differences may exist among people of different cultures are limited by the constraints of a common heritage and many shared features of mental life.

Cognitive Universals

Anthropological Views

Given the massive evidence that there are differences in mental functioning among cultural groups, the idea that there are no substantial cultural differences in thought *processes* may not seem worthy of examination. But several contemporary social science theorists take just this point of view. Like Boas, they argue that the "functions of the human mind are common to the whole of humanity" (Boas, 1965, p. 135). Whereas earlier social scientists took observed differences among cultures as *prima facie* evidence of underlying cognitive differences, these contemporary approaches consider the observed cultural dissimilarities to be merely different manifestations of common underlying cognitive structures.

Typical is the following statement by an anthropologist on this point:

The reasoning and thinking processes of different peoples in different cultures do not differ . . . just their values, beliefs and ways of classifying differ (quoted in Cole and Gay, 1972, p. 1066).

According to this view, observed differences are in the area of *content*: the belief systems and cultural premises of traditional people may differ from those in industrialized societies, but they embody the same logical processes and concern with relation of cause and effect. Similarly, classifications or concepts may differ in terms of what objects and phenomena are grouped together

and what attributes are used for grouping, but all classifications are arrived at by the same processes of abstraction and generalization.

Just as evolutionary theory played a significant role in the development of theories of human differences, a contemporary philosophical and methodological approach in the sciences and humanities—*structuralism*—has strongly contributed to the search for common principles underlying human cultural diversity.

The essential aspects of the structural approach can be illustrated by the work of Claude Levi-Strauss, a distinguished French anthropologist (1963, 1966).

Levi-Strauss explicitly repudiates the concept that there are lower and higher levels of mental development. On the contrary, he maintains that there are no differences in how the mind works from one culture to another or from one historical epoch to another. Primitive and Western scientific thought systems simply represent different strategies by which man makes nature accessible to rational inquiry. Both strategies seek objective knowledge of the universe; both proceed by ordering, classifying, and systemizing information; both create coherent systems. What then are the differences? According to Levi-Strauss, the basic difference is in the *material* used for thought—for example, the kinds of attributes that are used in forming classes. Primitive classification systems are based on qualities that are readily seen and experienced, whereas modern science relies more on properties that are inferred from necessary relations in the structure of the objects classified. For example, fruits and vegetables are classified by the average shopper in ways quite different from those of the botanist. Primitive classification systems generalize from the tangible properties of the members of the system and are thus limited by the concrete experience of the community.

Levi-Strauss suggests that there is an intimate relation between modes of classifying objects and ways of solving problems. Primitive science is exemplified by the *bricoleur*, or jack-of-all-trades, who has a fixed bag of things that he uses to make other things. The tools are never specifically designed for the task at hand, but rather constitute a collection of things preserved because they might come in handy. Their function depends upon the particular occasion in which they are used. The jack-of-all-trades is contrasted with the engineer, whose inventory of tools is variable, its com-

position depending on the task at hand. At the same time, the objects making up the engineer's inventory have fixed and stable purposes, whereas in the primitive's system a particular object is likely to have an amorphous and shifting status.

Levi-Strauss's generalizations are based on his analyses of classification systems, myths, kinship structures, and other cultural institutions and products. While he views his enterprise as one that demonstrates the universal and unconscious activities of the human mind, he is not directly studying psychological processes in the individual. His principal significance for the study of culture and cognition is his demonstration that ethnological material embodying the endlessly varied products of many cultures still testifies to common underlying human operations.

Linguistic Approaches

Additional support for cognitive universals comes from new developments in the science of language. These emphasize the complexity of all language systems; they deny that languages can be arranged on a scale of simplicity or complexity, or that conclusions about the cognitive structures of language users can be derived from a comparative analysis of language vocabularies. Modern linguists tend to stress the importance of *structural* features of language that are shared by all languages. They point out, for example, that all languages are composed of organized sequences such as sentences; all have rules for generating acceptable sentences; all have expandable lexicons. These assertions combine to form a point of view that de-emphasizes cognitive differences among different linguistic (cultural) groups.

Moreover, Noam Chomsky (1968) has developed a theory of grammar with profound implications for cross-cultural psychology. This theory maintains that all sentences—in their variety and uniqueness—are generated from a limited number of base components and a complex system of rules. Any human speaker who is competent in any human language, according to this theory, must store and use productive rules in a complex and nonmechanical fashion. The implication of this approach is that the cognitions or thinking processes of an individual cannot be less complex or constructive than the rules required for his speech production. Since there are no qualitative differences in the nature of lan-

guage rules, it is impossible to conceive of more "simple" or more "advanced" cognitive levels.

Such analyses have been of great importance in countering those approaches that persist in characterizing the thought of nonliterate peoples in terms of its "deficiencies." Like the anthropological work on cognition, however, the linguists' objects of analysis are cultural in nature, and specifying the properties of language and communication systems does not in any way tell us about the actual operations of the individuals using the systems.

Psychological Approaches

Within psychology, the structural approach rests on a massive amount of experimental and observational data collected by Jean Piaget, the Swiss psychologist, on the thought processes of individual children. Piaget, who refers to himself as a genetic structuralist, is well known for his theory of intellectual growth. He sees the interaction between the individual child and the environment as giving rise to successive logical structures that regulate thinking processes (see Piaget and Inhelder, 1969). The characteristics of these structures and their order of appearance are considered to be universal. They are the outcome of adaptive processes between human organisms, whose biological heritage is the same the world over, and environments, whose fundamental physical properties (coordinates of space and time, behavior of objects under gravitational forces, and the like) are identical.

In earlier writings, the principal role Piaget assigned to culture was that of accelerating or retarding the developmental process—that is, introducing variations in the *ages* at which successive logical stages make their appearance. Such variations come about because cultures differ in the specific ways they handle the tasks of cultural and educational transmission and in the patterns of social interactions they provide. Thus, Piaget (1966) suggested that the developmental lag demonstrated between rural and urban children in Iran and elsewhere might be attributable either to the "general characteristics of social interactions" or to deficiencies in educational transmission.

More recently, Piaget has opened up the possibility that the "final" stage of development—that of formal, propositional thinking, which in Western cultures becomes elaborated during the age

period of 12 to 15 years—might not appear at all, or might appear in more restricted and less general form, among cultures and individuals whose experience is limited to one or few technical or specialized occupational activities (1966, 1972). More extensive cross-cultural material is needed, he stresses, to follow up on the questions left unanswered by Levi-Strauss in respect to adult mentality:

We would like to see cross-cultural studies of cognitive functions, which do not concern the child only, but development as a whole, including the final adult stages. When Levy-Bruhl raised the problem of the "pre-logic" of "primitive mentality," he undoubtedly overemphasized the opposition, in the same way as his posthumous recantation exaggerates perhaps in the other way the universality of structures. It seems to us that a series of questions remains unanswered by the excellent work of Levi-Strauss: for example, what is the operational level of adults in a tribal organization, as far as the technical intelligence (completely neglected by Levy-Bruhl), verbal intelligence, the solution of elementary logico-mathematical problems are concerned? The developmental data relative to the lower age levels will attain full significance only when we know the situation of the adults themselves. In particular, it is quite possible (and it is the impression given by the known ethnographic literature) that in numerous cultures, adult thinking does not proceed beyond the level of *concrete operations*, and does not reach that of propositional operations (1966, p. 13).

As this passage makes clear, Piaget's expanded view of the impact of culture on the "end point" of development still leaves intact a theoretical scheme that postulates a universal developmental process at lower age levels: at each level attained, the thought structures characteristic of that level are universal.

The popularity of Piaget's account of intellectual development in children has generated the single largest body of related research in the area of cross-cultural studies (see Dasen, 1972, and Goodnow, 1969, for reviews). In later chapters we shall discuss several of these studies and their bearing on the controversial issue of whether Piaget's theory does in fact identify universal thought structures or whether it simply builds a universal theory out of an examination of the logical structures of Western thought. What is of special interest in this theoretical review, however, is that approaches to culture and cognition such as Piaget's, which emphasize *universals*, have like those stressing *differences*, become increasingly more flexible and less absolute. Is there a possibility,

then, of a synthesis that can incorporate cognitive sameness and differences in one coherent theory?

Soviet psychologists, working within a general framework of Marxist historical materialist theory, have been among those attempting to achieve such a synthesis. We will now turn briefly to a consideration of their views and the cross-cultural research they have generated.

Culture and Cognition: A Synthesis?

Since the early 1920s the Soviet psychologist L. S. Vygotsky and his students, among whom Alexander Luria is the most prominent, have developed an approach to the study of higher mental processes that stresses their *social-historical* character. This approach represents an attempt to extend to the domain of psychology Marx's thesis that man has no fixed human nature but continually makes himself and his consciousness through his productive activity:

The way in which men produce their means of subsistence depends first of all on the nature of the actual means of subsistence they find in existence and have to reproduce. This mode of production must not be considered simply as being the production of the physical existence of these individuals. Rather it is a definite form of activity of these individuals, a definite form of expressing their life, a definite *mode of life* on their part. As individuals express their life, so they are (Marx and Engels, 1846, reprinted 1970, p. 42).

The central idea, so forcefully expressed in this passage, is that man's nature evolves as man works to transform Nature. The sweep of this concept—that both subject and object, man and his product, arise from a unitary process of activity—can best be grasped by an understanding of what Marx meant by *production*. Marx used the term to refer not only to the making of material products but to mental products as well (law, religion, metaphysics, and so on); similarly, *productive activity* encompasses not only manual but mental labor—labor in its broadest sense. Relating the production of ideas, conceptions, and consciousness to “material activity and the material intercourse of men” is the core of Marx's *materialism*. While Marx agreed that all men in all

epochs engage in productive activity (that it is a general, universal process), he contended that in every time and place, the actual productive activity carried out is specific, concrete, and determined by the means of production at hand and the social relations among men to which they give rise. Thus, productive activity is a developing, historically determined process. Over the course of history “. . . men, developing their material production and their material intercourse alter, along with this their real existence, their thinking and the products of their thinking” (p. 47). This is the *historical* aspect of historical materialism.

A few quoted passages, of course, can do no more than suggest the depth and complexity of Marx's world outlook, an outlook that embraces but does not supercede the theories and methodologies of the various sciences. The very fact that this outlook emphasizes the complex, dynamic, and interrelated nature of all phenomena makes it impossible to simply extrapolate principles from Marx and apply them to the scientific question at issue. Thus, while psychologists and anthropologists working within a general Marxist perspective might agree on certain fundamental approaches, they often disagree vehemently in the way they elaborate them. It can be contended, for example, that the passage quoted above, referring to historical changes in thinking, applies only to the *contents* of men's conceptions and not to their thinking *processes*.

Vygotsky, however, maintained (and his views have given rise to the most sustained program of research) that changes occur in *process*. He tried to take account of both the general unchanging aspects of thinking processes and their specific, historically changing aspects by making a distinction between elementary psychophysical processes such as “sensation, movement, elementary forms of attentions and memory [which] are undoubtedly natural functions of the nervous tissue” and “higher psychological functions (voluntary memory, active attention, abstract thought and voluntary movement) [which] cannot be understood as a direct function of the brain” (Luria, 1971, p. 260). These higher processes are organized into *functional systems*, which arise in the course of historically determined practical and theoretical activities and change with the nature of these activities. The kinds of changes in activity that are presumed to make a difference in the structure of the higher mental processes are illustrated in the following description by Luria of conditions in certain isolated villages in So-