CHAPTER 13

HUMAN PERSONLITY DIFFERENCES AND INDIVIDUAL ASSIMILATION IN MODERN SOCIETIES

Realizing Individual Potential in Imperfectly Structured Societies

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13.1. The Paradoxical Persistence of Irrationalism in our Age of Reason.

13.1.1. The Promise and Rejection of Science in Today’s World. The steady advances in science and technology since the 17th century that we discussed in the previous chapter attest to the creative force of human reason to further our understanding of what the physical world is like and how to use its resources. Science and technology have greatly improved our current living conditions. The average person in developed societies begins his life by receiving good prenatal and postnatal health care, has ample educational opportunities during his childhood and adolescence to become knowledgeable and technically competent, and, as a young adult, has far more opportunities to develop his natural abilities and lead a prosperous and rewarding life than was ever possible in the past. Hence most of us should feel fortunate for having been born today rather than in times past. Nonetheless, discontent with modern life is widespread and many people look back nostalgically to previous ages, which they believe were better and happier. Unfortunately, irrational mental dispositions (emotions) retain a powerful influence on how we structure our lives, interrelate with others, and create and support the ethos of our culture. Why has the Age of Reason failed to bring about progress in equality and fairness in our daily lives and the management of our social and political affairs? Irrationalism in the 20th century caused two World Wars that were the most barbaric and devastating in the history of mankind, followed by decades of a Cold War with the threat of a nuclear holocaust that could destroy human life on the globe. Irrationalism persists in the 21st century as we engage in conflicts with organized groups of religious fundamentalists who reject most scientific advancements and seek to restore a medieval way of life. The successful advance of rationalism in science and technology is offset by the failure of rationalism to advance social, economic, and political order. The argument we shall present in this chapter is that this admixture of rationalism and irrationalism is largely attributable to the dynamics between three aspects of the human condition: (1) our complex neuropsychological evolutionary heritage; (2) individual differences in our intelligence, temperament, and character; and (3) collective differences in our culturally based value systems.

We cannot change human nature. But through scientific investigation and education, we can impart knowledge about the nature of the physical world and man’s place in nature as a unique animal species. And our societies ought to be able to set up rationally-based laws that improve economic and political order. In Chapter 3, we used “individual survival assurance” as an objective measure of neural and sentient progress in vertebrates. At the upper end of a wide range of fecundity, fish lay millions of eggs to assure the survival of their species (Section 3.3.1) while amphibians lay thousands (section 3.5.3). The mortality rate of reptiles is not that high but still considerable when compared with mammals. Crocodiles lay up to 90 eggs, lizards 30 eggs, and the tuatara 14 eggs. The eggs tend to be large with plenty of yolk to nourish the young after they hatch and may be buried under dense vegetation or under rocks. The eggs may or may not be guarded or cared for (crocodiles guard their nests, turtles do not) but the parents never feed the young after they hatch. The newborn reptile is equipped with instinctive behavior that allows it to escape predators and attack prey. Soon after birth, the tiny crocodile snaps at any small object passing by and takes cover when it sees a large looming object. These inborn recognition and response mechanisms help the young to survive under favorable conditions, but they do not match the skilled parental protection and guidance that the
infant mammal receives. Hence, mortality is still very high among reptiles and their individual survival assurance quite low. In contrast, the high survival assurance of our species increases the worth of each individual. Individual worth increases selective evolutionary pressure for greater intelligence, greater adaptability to changing environments, and greater survival. The culmination of the evolutionary pressure for greater intelligence peaked as humans evolved a complex mind. That mind used language to form abstract concepts and accumulate practical knowledge. Practical knowledge accumulated in cultural groups as humans adapted and modified environmental conditions so that they could expand their colonization to all parts of the globe except Antartica—even that continent has some scientific outposts. Man’s superior intelligence and his scientific endeavors have given us the technological world of today. However, there are some monumental scientific discoveries that are not accepted by many people—in spite of their being educated about these discoveries.

Through our cognitive abilities, we learn a vast amount of practical and theoretical knowledge about the world and behave rationally under favorable conditions. But our evolved and inherited emotions keep us from being purely rational. Much of the time we behave irrationally. There is an incomplete integration of our emotional dispositions with our mnemonic (early-learned) behaviors and our rational behaviors. These dispositions and behaviors are mediated by specific parts of the cerebral cortex. The apparent task of limbic brain areas is to integrate emotions with cognition. That interfacing is a precarious one and tensions inevitably develop during emergencies and in stressful situations. The arousal of an intense passion will urge us to move in one direction, the compulsive and perseverative force of early learned behaviors will dictate another course, and our reason may counsel still another course. It is as if our personalities are made up of three different complexes (Fig. 13-1). Our emotional-self inclines us to volatility, restlessness, and rebelliousness. At one time, we are happy, enthusiastic, and full of self-confidence. We appreciate what we own, are hopeful about the future, and are bursting with good will toward others. At another time, we are sad, dejected, despairing, overcome by anxiety and self-doubt, distrust others and become hostile toward them. Although we may be well fed, sheltered and secure, we become envious about another’s possessions, and anger may make us engage in antisocial activities. In contrast, our mnemonic-self inclines us to follow the trodden path, seek the familiar, persevere with the safe and the tried, and be circumspect and docile. It disposes us to see matters in the light of what we have been taught and have assimilated in our youth, judge issues in terms of socially acceptable tradition, and act in accordance with the beliefs and stereotypes of our culture or subculture. Finally, our rational-self makes us inquisitive and critical, it induces us to understand what things, events, and other people are like through exploration and experimentation and, above all, by questioning what we are taught. The unparalleled power of human reasoning has produced a new dynamic in the interrelationships of the tripartite system of psychobiological dispositions. Although we share our sense organs and perceptual systems with our animal ancestors, we experience the world in a different light than they do because we have language-mediated thinking and reflection. That has turned us into self-conscious beings who can question who we are, what we are doing, and how we fit into the larger order of things. Reflective reasoning makes us ponder our past, present and future, and allows us to improve our condition by creatively restructuring the physical and social world we live in. On the other hand, we use many of these technical and organizational achievements to oppress, exploit,
tyrannize, maim and kill millions of our own kind. We fail to equally distribute the bounties of our earth and create areas of famine, disease, hopelessness and lawlessness. Our enlightened understanding of the laws of nature is mixed up with widely held illusions, unrealistic ideals, superstitions, obsolete ideas, religious dogmas, and practices. A few examples are discussed in the following sections.

13.1.2. Science and the Mind-Body Problem. We begin with the hypothesis that amorphous sensation and basic emotions emerged as control mechanisms of behavior in primitive metazoans where simple sense organs and a rudimentary nervous system was beginning to evolve. Primary perceptions of whole objects in the outside world emerged in lower vertebrates with paired eyes. Eyes evolved topographic connections to form maps

![Diagram of the cerebral cortex showing different areas and their functions.](image)

**STRUCTURE AND FUNCTION IN THE CEREBRAL CORTEX RELATED TO THE TRIPARTITE SELF**

**A. LATERAL VIEW**

- **RATIONAL SELF:**
  - Uses the **MOTOR ASSOCIATION CORTEX** and **SENSORY ASSOCIATION CORTEX**—the largest structures in the brain—to produce LANGUAGE-BASED THOUGHTS.
  - Is responsible for our intelligence, inquisitiveness, exploration, and experimentation.

- **EMOTIONAL SELF:**
  - Uses the **LIMBIC CORTEX** to become aware of our emotions that incline us to volatility, restlessness, and rebellion.

- **MNEMONIC SELF:**
  - Mainly uses the **LIMBIC CORTEX** and the **LIMBIC ASSOCIATION CORTEX** to shape our behavior according to our early learned value systems.

**B. MEDIAL VIEW**

*Fig. 13-1. Our three "selves" and their localized areas of activity in the cerebral cortex.*
in the fish brain where internal processing formed perceptions. More advanced substantive perceptions emerged in terrestrial vertebrates with manipulative tongues and mobile limbs that made multimodal perceptions possible. But mammals evolved brains with the ability to use sensory information to process the most complex perceptions. Information gained by active exploration of the environment through eye-tongue, eye-limb, and eye-hand coordination, and their concurrent multimodal integration in several forebrain (mainly cortical) processing stations, was responsible for the great behavioral advances displayed by mammals. Rudiments of the ability to think and reason began to emerge as the forebrain (mainly the neocortex) expanded in higher primates and early hominids. Finally, the ability to reflect upon the world and oneself, and gain technical mastery of the environment developed as linguistic skills were acquired by modern man and we became the beneficiaries of an accumulating cultural heritage. In summary, these three types of perceptions—amorphous, primary whole objects, multimodal perception, and conceptual perception—form an integrated hierarchic system that enables us to know the world and ourselves in great detail.

Sentience is the ability to feel, perceive, or experience subjectively. If sentience is a ubiquitous phenomenon in the animal world, how is it related to the material substrates and processes that it depends on? Unlike physical matter, sentience is not tangible, visible, or localizable in space, and unlike physical energy, its force cannot be directly measured by reading a dial on a recording device or looking at a digital display on a computer. It is an enigma (or mystery, if you wish) how certain material processes, such as brain activity, give rise to immaterial subjective experience. How can subjective experience trigger organic processes? The enigma of the mind-body relationship does not mean that we should deny the existence or significance of either of them. Mind-body interactions undoubtedly take place when physical stimuli give rise to feelings, sensations, perceptions, thoughts, and produce overt behaviors (Fig. 13-2). We cannot consider either mind or body as illusions. If mind were an illusion, we would have to deny everything that we know about: the physical world around us, the people we are acquainted with, indeed, our own existence as self-conscious and volitional beings. If matter were an illusion, why are we all engaged in breathing, eating, drinking, and making efforts to stay healthy and prosper?

While many neural activities—reflexes, visceral activities, behavioral automatisms—proceed without evident mental involvement, others are dependent on sentient states like feelings, sensations, perceptions, memories, understanding, intentions, and planning. No matter what our conception of subjective experience, it depends on interaction with the physical world. Reflex retraction of our finger from intense heat is not only dependent on the stimulation of pain receptor cells in the substantia gelatinosa of the cervical spinal cord but also on the conscious feeling of pain. Without feeling (as when dorsal root afferents are anesthetized or severed) we will not react to harmful stimulation. Another example: identifying an object in the visual field is dependent on retinal excitation, conducting optic nerve impulses, transmission to the lateral geniculate body, and relay to visual cortex in the occipital lobe. But the subjective experience of a specific visual perception is also dependent on recollecting earlier encounters with it and understanding its concrete or symbolic significance. There must be some persisting material trace in our brain that preserves the memory of our past encounters, and it is the subjective recollection of the encounter that makes us treat future events with familiarity.
Association areas generate self-awareness, subjective experiences, language-based thoughts, imagination, dreams, and make choices for appropriate behavioral responses.

Final behavioral output is generated by activity in the primary motor area.

The primary sensory areas generate PERCEPTIONS.
How does immaterial sentience fit into the material order of things? For those who believe in panpsychism, the problem doesn’t exist because they attribute conscious properties to all matter. But panpsychism cannot be reconciled with the principles of modern physics, chemistry, and biology. There is no evidence for teleological behavior, let alone causation by emotions or intentions, in the random interaction of atoms and molecules during inanimate events, such as the formation of clouds, the downpour of rain, or the generation of a tornado. Indeed, there is no justification for attributing feelings and thoughts to a computer that performs complex calculations and carries out difficult goal-directed tasks; that teleological performance is clearly due to the technical expertise of the people who assemble computer hardware and the sophistication of the programmers who write its software. The mind-body problem may be sidestepped by those who believe in the supernatural origin of the soul or spirit. They may argue that by virtue of its divine origin, the mind can do all sorts of miraculous and magical things that natural science cannot explain. But this is an admission of ignorance of everything that science has discovered about the brain-mind interrelationship. There is ever-growing experimental and clinical evidence that specific mental states and aptitudes depend on the operation of specific brain structures in local and widely distributed neural circuits.

We do not have a satisfactory explanation of how the activity of the visual cortex produces sight, as a subjective experience, or how the activity of the auditory cortex produces sound. Possibly, sentience is an inherent potential (in the Aristotelian sense of the term) of physical matter, and it is realized (emerges) when physical matter is organized into the configuration of a specific sense organ. The material substrates of sentience are extremely elaborate, protein-complexes built into the membranes of sensory receptors that have taken several billion years to evolve. But once we accept the proposition that sentience is a product of a complex material substrate that reacts to various environmental stimuli in eukaryotes, protozoans, primitive metazoans, and ever more complex brain activity in more advanced animals, discussions of the mind-body problem can embark on a more promising course.

Instead of dealing with the mind from a metaphysical perspective, science gives us tools for a more modest enterprise—that of empirically correlating specific kinds of mental activities with specific kinds of neural processes. Just think about how we accomplish something difficult, like preparing a lecture. We have to think about the topic, read what others have thought about it, memorize the highlights of what we have read, formulate new ideas, and so forth. Current PET (positron emission tomography) and fMRI (functional magnetic imaging) studies are showing regional shifts in the brain’s metabolic activity as we engage in mental activities (Fig. 13-3). For instance, reading is associated with increased metabolic activity in the projection and association areas of the occipital lobe; listening is associated with activation of the temporal lobe. Correspondingly, circulatory failure in a specific brain region from a stroke, localized abnormal electrical discharges detected in EEG recordings, or local application of an anesthetic, will interfere with specific mental functions, or with a small set of functions, such as the inability to recognize people, comprehend written words, speak, move body parts, and so on. There is overwhelming evidence from clinical observations and laboratory experiments of an interdependence between neural activity and sentient states, and we can profitably study the nature of that relationship to better understand how our body and mind function in health
and disease. Modern neuroscience shows us that our “minds” are entirely dependent on brain activity that is capable of generating immaterial thoughts.

13.1.3. The Evolutionary Perspective vs. Intelligent Design. The accumulation of scientific knowledge can reveal much more information about our world than detailed minutia of sensation and perception. Great insights and ingenious empirical evidence revealed that the earth is round long before we ever ventured into space. The universe is so vast that its limits have yet to be discovered. Earth is a planet circling a star (our sun) in a vast galaxy of other stars. Continents drifted on earth and drastically changed their shapes during geologic time. Living things appeared on earth billions of years ago and the flora and fauna of earth today is very different from 100 million years ago, 1 billion years ago, to 3.5 billion years ago. These new species evolve according to the law of natural selection. In spite of the irrefutable scientific evidence supporting these true characteristics of nature, many people do not accept them. Instead, they use the argument that religious beliefs take precedence over actual scientific data, and therefore, science must be wrong. One of the most controversial findings about the nature of life on earth is the theory of evolution. Most of us agree that we have a close biological relationship to animals. Many of us accept the overwhelming scientific evidence supporting Darwin’s pioneering work on human and animal evolution. Indeed, all of the discoveries in modern molecular biology confirm that evolution is a fact, not a theory. As a result of the Sputnik launch in the late 1950s, American education initiated an overhaul...
of how science was taught in schools and supported teaching new curricula that emphasized molecular biology, evolution, subatomic physics, etc. That disturbed religious fundamentalists who had deep-seated religious beliefs in man’s separate creation. Around the mid-1980s, the theory that man’s emergence is the outcome of “creationism,” or later “intelligent design” was marketed by pseudoscientists and was inserted into textbooks as an alternative explanation for human evolution.

But take a critical look at intelligent design. If we are created in God’s image, how are we to account for the persistence in our mental life of so many “lowly” or “beastly” dispositions and character traits? Why is there an incessant inner struggle between the urgings of irrational passions and the counsel of reason, of selfishness and altruism, rebelliousness and docility, credulity and good judgment, neatness and disorderliness, creativity and destructiveness? Why that long human struggle through the ages to rid ourselves of myths and magic, of superstition and ignorance? The conservation of ancient organic mechanisms, we argue, is preserved in our emotions today, either in their original form or in a modified form. On the contrary, an intelligent designer—much like a modern engineer—will discard without hesitation detrimental and useless components of an instrument as soon as better ones become available. For example, why were we not endowed with six extremities—four legs for postural stability, and two arms for object manipulation—like the mythical Centaur? Or still better, why do we not have wings—like the mythical angels—so that we could fly over terrestrial obstacles, like rivers and mountains? The evolutionary explanation is that we have two legs and two arms as a consequence of our vertebrate legacy, a modification of the quadruped locomotor apparatus that evolved in ancestral amphibians and was passed on to us with modifications through ancestral reptiles and mammals. Amphibians evolved four limbs as an optimal set of jointed appendages well suited for swimming in the water, for walking, running, or hopping on land, and climbing on trees. Amphibians evolved other structures (the tongue and jaws) for object manipulation. Later in the course of evolution, the genetically conserved four extremities underwent various structural and functional transformations in different species: they became vestigial in snakes, the forelimbs turned into wings in birds, and the fingers formed the skeletal elements of wings in bats. In our own prosimian ancestry, the forelimbs and hind limbs developed into versatile dimorphic instruments, the two playing different roles when jumping or swinging from tree to tree, when assuming a seated or upright posture, when reaching for and picking fruits, or when engaged in self-grooming or grooming a mate. The long fingers of brachiating pongids became shorter and more closely aligned with the thumb in our hominin ancestors, permitting the precision grip for handling and making tools. At the same time, the hominin feet became transformed into supporting platforms for upright stance and biped locomotion. But this evolutionary process was never completed. For example, the human spinal column, legs and feet are not ideally adapted to the demands of biped locomotion. The structural weakness of the human vertebral column, the joints of the pelvis and the knee, the incomplete transformation of the thigh and leg bones to form a vertical column for more economic support of the upright stance; and the fragile feet composed of a large number of greatly modified small bones and digits—all these bear witness to an imperfect evolutionary transformation of the quadruped amphibian anatomy into a biped one. Paralleling the evolution of our motor apparatus, we can also trace with lesser or greater confidence, the evolution of our genes and enzymes, cells and tissues, digestive and respiratory systems, our heart and circulatory system, and our sensory
apparatus and central nervous system. Consider “intelligent design” that comes from gifted human engineers: the gas-propelled automobile of today shares few components with the horse-drawn carriage of yesterday; the modern electronic calculator shares no features with the abacus of earlier times.

In contrast to the theory of intelligent design, Darwinian evolutionary theory, used evidence based on paleontology and comparative anatomy of the similarities and differences between animals in isolated environments. That evidence indicates that the appearance of *Homo sapiens* has followed a far different course than what efficient intelligent design implies. *Homo sapiens* came about only after a long, tortuous, trial-and-error process that involved continual and slight variations in structure coupled with environmental selection pressures to favor increased survival—Darwin’s natural selection—over many millions of years to finally see man emerge only a few million years ago.

It is important to state that the theory of intelligent design or creationism has no scientific evidence to support it and should be considered pseudoscience or junk science. On the other hand, the theory of evolution has always been upheld by research in genetics, molecular biology, paleontology, archeology, and anthropology. To date, there is NO scientific research that challenges the veracity of evolution by natural causes. Yet only 32% of the USA population accepts that evolution results from natural causes according to a Pew Research Poll conducted in 2009. In 1987, the Supreme Court ruled in *Edwards v. Aguillard* that creationism (intelligent design) cannot be taught in public schools because it advances a particular religion. Indeed, the acceptance of evolution differs greatly between various religions (Figure 13-4A), and the United States still has the largest proportion of its population rejecting evolution among developed countries (Fig. 13-4B). In contrast, 87% of scientists accept Darwinian evolution and consider it one of the most important scientific theories. The high level of scientific ignorance in the United States is dangerous; it interferes with the election of enlightened leaders; supports passing laws that limit academic and personal freedom; and retards American ability to compete with other developed countries in the world marketplace. This phenomenon in the USA is a perfect example of the prevalence of irrationalism in modern society.

Once we accept the lengthy course of our evolution from animals, how do we account for our unique abilities that distinguish us from all other animals? Was this a preordained outcome or a consequence of serial chance events? Some older thinkers who did accept human evolution have argued, much like modern proponents of intelligent design, that the evolutionary process that climaxed in man’s emergence was a preordained event—not based on Darwin’s theory of natural selection. Orthogenetic human evolution theorizes that the fertilized ovum is predetermined to turn into a fully formed newborn through a long and elaborate process of morphogenesis; the helpless newborn is preordained to realize its potential and matures into a competent adult. But the paleontological record does not support orthogenetic human evolution. Although the evolutionary history of many life forms on earth finally led to the emergence of man, there is no “direct line,” rather, there are myriads of lines that took different trajectories. Evolutionary history is filled with species that became extinct, others that became entrenched with relatively few modifications, and still others that became highly evolved but in directions quite different from that taken by man. The emergence of hominids was a fortuitous
event—*not an inevitable one*—and the survival of a single species of hominids (*Homo sapiens*) may also have been a lucky event. But our species may also become extinct, like so many others that have gone before us, if we keep exploiting non-renewable resources of the earth.
13.1.4. Man’s Unique Intelligence and the Belief in the Immortal Soul. Superior intelligence is a unique feature that distinguishes man from other animals. The physical resemblance and mental differences between animals and humans led Linnaeus (Frängsmyr et al., 1983) to classify man as a primate in the genus of Homo sapiens. Our unique linguistic ability allows us to directly communicate with one another what we ourselves experience and what we are taught. Language preserves our cumulative cultural heritage from generation to generation. Our unique imagination allows us to transcend what we know from experience and fancy things that have never existed to come up with new ideas and plans. Our unique creativity allows us to fabricate complex tools to better exploit available resources, build energy-efficient dwellings for shelter, and domesticate plants and animals to reliably feed and clothe ourselves. Our cooperative organizational skills enable us to live in large communities for mutual benefit; to specialize and assume different technical, professional and social roles; efficiently exchange goods and services throughout much of the world; and establish rules of right and wrong to regulate our interpersonal relations. It is these vast differences between us and animals that led to the age-old idea that we are not animals but special beings, created in the image of God for some greater cosmic purpose.

But scientific investigations from the 17th century onward document that all animals have feelings and perceptions that are dependent on biological processes; animals have primitive minds that are linked to the complexity of their brains. This accumulating scientific evidence contradicts the widespread belief of the prescientific period that the mind is supernatural, is immortal, equips us with moral responsibility and free will. Often called the “spirit,” the “soul” or some other exalted term, the divine mind is believed to join the individual’s mind at some stage of his bodily development and departs upon his death to take up an abode in heaven, hell, or purgatory (the Western religious tradition) or become embodied in another individual (the Eastern religious tradition). These beliefs are irreconcilable with the scientific evidence. The mind emerges in the animal kingdom with sensations. The ability to experience sensations during human development is an ontogenetic progression of this evolution. Elementary sensations, like experiencing pain, may emerge during the first trimester of embryonic development in association with the maturation of the spinal cord and brainstem, and some ability to experience additional sensations, like light vs. dark or hearing, may be present by the early third trimester (Altman and Bayer, 2001). While it is not entirely clear at what stage the individual becomes a sentient being during prenatal development, it is very clear when he becomes insentient. According to all the available evidence the ability to perceive and think is completely abolished as the biological function of the brain ceases (Fig. 13-5).

Why then the prevalent irrational belief in the mind’s survival after death? Is that due to ignorance of the scientific evidence or an intellectual failure to rid ourselves of traditional misconceptions, or is it something more deep-seated, the consequence of how our irrational emotions mold our thoughts? People who endure poverty, humiliation and other forms of injustices, people who find their life meaningless or hopeless because of disappointments in their aspirations and frustration of their endeavors, people who suffer from insurmountable handicaps, irremediable disabilities and incurable ailments, and people who face bouts of anxiety or depression, often derive strength from the belief in the soul’s immortality. Near the time of death, almost everyone finds comfort in belief in the immortality of the soul. That belief
allows us to look forward to a more just, peaceful, harmonious and rewarding afterlife where our liberated souls will enter at death. The belief in immortality also consoles the bereaved who think they will be reunited with their deceased loved ones in heaven. But sentience is a product of brain activity, and belief in immortality is nothing but a grand illusion sustained by emotional needs. How can science offer an alternative to those who need psychological

**Fig. 13-5.** Scientific evidence (A) indicates that the mind cannot operate without a living brain—especially the functioning cerebral cortex; once the brain stops functioning at death, the mind is also dead. Religious beliefs center on the supernatural origin of the mind (B) that uses the brain for communication during life, but lives on in a spiritual domain after death.
support to cope with life’s difficulties? Will most people learn to face reality—the finality of physical and mental death—or continue to cling to their belief in immortality, much as they believe in magic, superstitions, horoscopes, and miracles? Our conception of the brain-mind’s hierarchic organization—with primitive, ingrained emotions being the most basic components of human behavior and reason more superficial and malleable—suggests that the widespread irrational belief in immortality will endure because of the comfort it provides.

13.1.5. Climate Change and Environmental Modification. It is very likely that climate change also played a role in advancing the human mind. Monkeys and apes inhabited undisturbed stable forest environments during their evolution. We assume that hominization took place in populations where the forests thinned out as the climate became more dry. A few hominid populations with larger brains and rudimentary bipedal locomotion moved between the forest and savannah to hunt. This change in behavioral patterns promoted greater survival because it tapped a new food source. Eventually that behavioral shift created an altogether new way of life that was built on the division of labor—individuals with more cunning hunting skills assumed leadership and taught others their tricks. This transformation was predicated not only on brain expansion, tool making, and weapon use but also on the use of language for communication to pass on improvements in hunting techniques to succeeding generations. But the accumulation of cultural traditions was a slow process, with the early epochs (Eolithic, Lower Paleolithic) enduring over millions, and later, hundreds of thousands of years. That suggests that human cultural evolution was built by accumulating innovations of individuals with superior talent over a long time.

Consider an important facet of the cultural way of life—making fire and using it (James, 1989; Wrangham, 2009). The use of fire gave humans the best tool to modify their environment. Rather than eat less nutritious fruits, berries, insects and small forest animals, the biped ape-men of the savannah had the opportunity to scavenge or hunt larger game and feed on far more nutritious meats. The change in diet posed both behavioral and nutritional problems. Ape-men had to compete in the open grasslands with viciously clawed and toothed carnivores and raw meat is difficult to chew and digest. However, early men learned from each other that wild animals have a great fear of fire and flee heedlessly; one can safely wait on the sideline until the fire burned out and enjoy roasted meats. Fire caused by lightning gradually gave rise to the idea that it could be produced intentionally (Fig. 13-6), and that it is has endless beneficial uses. Beyond making wild beasts flee and making meat more savory, fire provides warmth in cooler climates, lengthens the day, and allows clan members to sit around the campfire and socialize. The major cultural contribution of fire came, of course, when its temperature could be controlled to extract metals from ores and to turn clay into ceramics. The history of the invention of fire making, and how it became a major facet of cultural life is not well established because it is difficult to distinguish between natural and artificial burning. There is some evidence for the control of fire by the Middle Paleolithic about 1.5 million years ago; better evidence from about 0.5 million years ago. The systematic use of fire in pits and hearths, and the practice of fanning fire so that it reaches high temperatures originated relatively recently.

Men with a contemplative bent recognized the great importance of fire in human life a long time ago, and myths have abounded around this and other cultural advances. An old
Chapter 13: Personalities and Societies

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The notion was that cultural advances were divine gifts—the Greek myth of Prometheus stealing fire and giving it to man is an example. The philosophers of Greece and Rome conjured up muses—supernatural spiritual agents to explain the outbursts of creativity by architects, sculptors, poets and playwrights. By the end of the 19th century, evolutionary theory replaced supernatural explanations, and human creativity was attributed to the work of gifted individuals who had insights that produced cultural advancement. Beginning in the late 19th and throughout the 20th centuries, psychologists began to quantitatively study individual differences in aptitudes, intelligence, and personality. All of these events in our mental history point to the preservation of reason and cognitive advances in our day-to-day behavior. Today, most humans realize that these advances were the results of their own mental and scientific efforts to confront environmental challenges. Indeed, if we are not able to rationally confront problems in our rapidly changing earth, we will not survive.

13.2. The Dynamics of Our Neuropsychological Evolutionary Heritage.

13.2.1. The Accumulation of Advances in Brain Function. The evolutionary approach can go a long way toward explaining the complexities of our mental organization. Our sense organs and core structures in our brain inform us of the external world and our stance within it—a legacy from our ancestors. But our many mental dispositions are also an ancestral legacy. The human mind is the product of a long evolutionary history that began with the emergence of elementary sensations and primal emotions as internally felt drives—initially as pain and pleasure, or craving and aversion. These primal emotions helped the simplest of animals to discern what is beneficial or harmful, what it should accept or reject, pursue or avoid, flee from or fight. But primal emotions lack discriminatory power. The pain experienced may often be associated with tissue or organ damage. Pleasure may be evoked by stimuli that are also harmful. Beneficial conditions may be unnoticed or not appreciated. Mortal danger may fail to produce fear, and fear may be triggered by intense but innocuous stimuli or cues. Hence, there was selective evolutionary pressure for mental faculties that provided improved assessments of events in the outside world and more efficient ways to deal with opportunities and challenges in the environment. Some of these mental advances are listed in Table 13-1. How did our understanding of the world come about? The answer is based on
three histories: a phylogenetic one, a cultural one, and an ontogenetic one. The phylogenetic advance begins with: (1) the evolution of unformed sentience in prokaryotes, protozoans, and primitive metazoans. (2) Next, there was object perception in amphibians, reptiles, and limbless fish—all with bilateral eyes but without digital dexterity. (3) The next advance was the emergence of primitive concept formation in early mammals and tacit awareness in higher mammals. (4) The final advance was language-supported explicit consciousness and self-consciousness in man. The cultural advance is the prehistory and history of man from *Australopithecus* to *Homo sapiens*. We know little about prehistoric man’s knowledge of the world, with the exception of the archeological remains left behind—burial practices, idols, amulets, cave paintings, etc.—that give us hints about Paleolithic and Neolithic beliefs. There are ethnological descriptions of the rational accomplishments and irrational beliefs—myths, legends, superstitions and magic practices—of preliterate people. The historic record also documents the slow but progressive increase in man’s understanding of the world that became transformed into rational philosophical concepts and scientific understanding. But how did we acquire the ability to construct a true picture of the world we live in?

### TABLE 13-1

**THE PROGRESSION OF MENTAL ADVANCES**

<table>
<thead>
<tr>
<th>MENTAL ADVANCE</th>
<th>SHARED WITH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved sensory acuity in olfaction, taste, vision, audition, touch, and proprioception</td>
<td>FISH, AMPHIBIANS, REPTILES</td>
</tr>
<tr>
<td>Improved multisensory integration</td>
<td>FISH, AMPHIBIANS, REPTILES</td>
</tr>
<tr>
<td>More realistic internal representation of the external and internal worlds</td>
<td>LOWER MAMMALS</td>
</tr>
<tr>
<td>Differentiation of emotions for a richer matching of inner needs and outer realities</td>
<td>LOWER MAMMALS</td>
</tr>
<tr>
<td>Awareness of cues that predict probable future outcomes</td>
<td>PRIMATES</td>
</tr>
<tr>
<td>Short-term and long-term memory to link current events to recollections of the past</td>
<td>PRIMATES</td>
</tr>
<tr>
<td>Associative learning to modify innate dispositions, actions, and reactions on the basis of individual experiences</td>
<td>PRIMATES</td>
</tr>
<tr>
<td>Conceptual categorization and verbalization of experiences (language)</td>
<td>UNIQUELY HUMAN</td>
</tr>
<tr>
<td>Cognitive reasoning</td>
<td>UNIQUELY HUMAN</td>
</tr>
<tr>
<td>Imaginative thinking</td>
<td>UNIQUELY HUMAN</td>
</tr>
<tr>
<td>Deliberation, contemplation, and dreaming</td>
<td>UNIQUELY HUMAN</td>
</tr>
</tbody>
</table>

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Improved sensory acuity in olfaction, taste, vision, audition, touch, and proprioception

Improved multisensory integration

More realistic internal representation of the external and internal worlds

Differentiation of emotions for a richer matching of inner needs and outer realities

Awareness of cues that predict probable future outcomes

Short-term and long-term memory to link current events to recollections of the past

Associative learning to modify innate dispositions, actions, and reactions on the basis of individual experiences

Conceptual categorization and verbalization of experiences (language)

Cognitive reasoning

Imaginative thinking

Deliberation, contemplation, and dreaming

LOWER MAMMALS

PRIMATES

UNIQUELY HUMAN

UNIQUELY HUMAN

UNIQUELY HUMAN

UNIQUELY HUMAN
13.2.2. Epistomology. The traditional branch of philosophy concerned with the true or false nature of our knowledge of the external world is epistemology. Three often-discussed epistemological issues are: (a) How do we get information about the outside world? (b) How are we able to interpret the information received? (c) To what extent does our perception, as a mental process, represent what really exists? We begin with a brief review of the contributions of neuroscience to a new perspective on these issues. We follow that with a summary of the hypothesis that the difficulties we have in getting to know the real world—our epistemological predicament—is due to the evolutionary history of human sentience. The evolution of conscious knowledge of the world is implied in the old notion that sensation, perception, and cognition constitute different stages in our acquaintance with the external world. Sensations—smells, tastes, sounds, colors—are viewed as the most elementary or primitive glimpses of the outside world. Percepts—recognition of a rose by its fragrance, a steak by its flavor, a melody by its sound pattern, or a tree by its visual configuration—are more complex and advanced because they are composed of multisensory integration. Ideas—categorizing a rose as a flower or a steak as red meat—are still hierarchically more advanced because, in addition to their sensory and perceptual contents, they have conceptual and abstract features.

Scientific Advances Tell Us How We Get Information about the Outside World. Since human beings began to contemplate the outside world and themselves, it must have been evident that our sense organs are the instruments we use to know about things around us and their properties. But that did not mean we understood how the sense organs work. With reference to vision, some early Greek philosophers, like Empedocles and Democritus, speculatively reasoned that objects emanate visual images (eidola) of themselves and that these replicas, transmitted through the air, enter the pores of the eyes and coalesce there with the inherent “visual fire” of the eyes to produce images (Siegel, 1959). This dual origin of vision was widely accepted by the ancient Greek philosophers and was made popular by Plato (1952) in his Timaeus and by Aristotle (1908) in his De sensu. Even Galen, who centuries later already had a fair acquaintance with the structure of the eye, assumed that vision resulted from an interaction between the light that enters the eye from the outside and the “animal spirit” that originates in the brain ventricles and goes to the eye through a “canal” in the optic nerve.; his idea was accepted until the late 18th century. But it is during the late 18th century that a major scientific discovery—animal electricity—opened a new world that revealed the true nature of sensations and how the nervous system processes them.

True understanding of sensations and motor responses began in the 1790s when Luigi Galvani discovered “animal electricity” in a frog nerve-muscle preparation (Table 13-2). Sensation, perception, and the association of ideas as purely mental processes soon became linked to electrical activity in peripheral sense organs and in the central nervous system. Correlation of the mental and the physical began with the fanciful “nerve vibration” theory of David Hartley in the mid-18th century (Finger, 1994). But that was soon abandoned when scientists realized that the nervous system operates as a complex bioelectric circuit that receives and processes sensory information and coordinates appropriate motor actions. The demonstration by Charles Bell (1811) that the ventral roots of the spinal cord are responsible for muscular contraction and, by François Magendie (1822), that the dorsal nerve roots mediate touch sensations were the first well-established facts for the segregation of input (afferent) and output (efferent)
circuits between the body and the central nervous system. Emil du Bois-Reymond (1848) and others clearly established that nerves conduct electricity, and its speed was measured by Hermann von Helmholtz (1850). At the same time Johannes Müller popularized the idea of “specific nerve energies,” meaning that the subjective quality of a stimulus (say, sight versus hearing) depends on the particular nerve that was stimulated (visual or auditory) rather than on the physical properties of the stimulus (Brazier, 1959, 1984). For example, stimulating the optic nerve with a mechanical blow, chemical irritation or the passing of electric current, give the subjective experience of light. It is evident that seeing does not involve *eidolas* from the outside world reaching the mind, as the naïve realists assumed. The sense organs, the sensory nerves, and the brain must operate in a different way to process information.
Bioelectricity as the “language” of sensation and motor responses began to take on a new meaning when Fritsch and Hitzig (1870) demonstrated that electrical stimulation of discrete areas in the dog motor cortex caused different body parts to move. That discovery was followed by growing pathological evidence from stroke patients that the human cerebral cortex has regional specializations for vision, hearing, speech comprehension, speech production, specific motor movements, etc. The idea that behavior is a stimulus-response process mediated by an assembly of “reflex arcs” within the central nervous system was strengthened by Sherrington’s (1906) physiological work showing that excitatory and inhibitory neurons exist within a reflex arc in the spinal cord. Microscopic observations in the mid-19th century showed that the nervous system, just like any other part of the body, has a cellular organization. Cajal’s (1909-1911) histological studies led to the “neuron doctrine,” according to which each nerve cell is a discrete developmental, structural and functional unit. Cajal suggested that nerve cells have both an input area, the dendritic branches, and an output line, the axon. The histological demonstration of the structure of the sense organs—like the papillae of the tongue, the tactile “corpuscles” of the skin, and the rods and cones of the eye—provided further support for the notion that elementary sensation depends on the activation of specific sensory and neural
cells that convey finely organized stimuli from the outside world to the brain. In addition, anatomical evidence indicates unique cortical cytoarchitecture (cell arrangement) exists in different areas (Campbell, 1905; Brodmann, 1909). Adrian (1928) showed that information transmission is based on the propagation of frequency-modulated, all-or-none nerve impulses that are alike in all nerves, suggesting that sensory discrimination must be a central function of the cortical areas where the nerve pathways terminate. Berger (1929) used scalp electrodes to record electrical activity in various parts of the brain (EEG-electroencephalogram) after sensory stimulation. Later neurophysiologists used EEG to map the distribution of cortical activation after stimulation of various sense organs (e.g., Woolsey, 1947) to their final cortical areas. Penfield (1958) completely mapped the motor and sensory cortices and showed a representation of the body surface (the “homunculus”) existed. He also stimulated different areas of the exposed cerebral cortex in awake patients during brain surgery and found modality-specific subjective experiences were recalled as if they were happening again.

Important advances in the mid 20th century with intracellular microelectrode recording techniques reveals even greater detail about nerve interconnections and physiology. Hodgkin and Huxley (1952) and Eccles (Curtis and Eccles, 1959) discover that the ionic currents are responsible for the nerve action potential, and postsynaptic excitatory and inhibitory potentials. Direct stimulation of sensory receptors leads to graded (analog) responses—receptor potentials—at the junction between sensory cells and afferent nerves. Depending on the magnitude of the analog signal, frequency-modulated all-or-none (digital) signals are conducted to the central nervous system (Gray, 1959). When microelectrodes are inserted into single cells in visual areas of the cat cerebral cortex, each cell responds to one facet of visual stimuli (e.g. edge detectors, etc.; Hubel and Wiesel, 1962). It is now well established that the intricate anatomy of the eye, ear, and other sensory receptors are highly specific transducers of electrical stimuli into digital nerve impulses. These impulses travel in topographically (map-like) organized pathways through the spinal cord, brainstem and diencephalon to terminate in topographically organized cortical areas that decode the input—still not thoroughly understood how they do that—and produce conscious perceptions. But the steady accumulation of scientific data shows the linear march of knowledge in our rational understanding of the functions of the nervous system.

To summarize, a large body of scientific experimentation shows that pattern discrimination is based on inborn simple feature detector mechanisms. Receptor cells in sense organs are linked at all levels of their journey in cranial and spinal nerves, to organized fiber tracts and processing neurons in the brainstem and diencephalon, and finally to organized terminations in the cerebral cortex. The cellular elements never operate as individuals but always as organized wholes. In as simple an organism as the horseshoe crab (Limulus), if light falls on a single visual receptor, the discharge of that receptor is amplified because the discharge of neighboring cells is inhibited (Hartline, 1949). The weak point of light stimulating a single cell is thereby turned into a powerful signal from the outside world. Subsequent work shows that excitation and lateral inhibition are innate synaptic mechanisms that turn sensory receptors into feature and pattern recognizing detectors. In the mammalian retina, single ganglion cells have variably-sized, antagonistically organized on-center or off-center receptive fields, that is, they respond maximally to a bright or a dark spot in a particular location in the visual field. Such a
process may be the substrate of elementary visual sensation. Significantly, this input becomes
elaborated in brain organization—such as within and between different layers of the lateral
geniculate body in the thalamus and between different layers and columns in the visual (striate)
cortex. The first stage of retinal input processing in the monkey primary visual cortex activates
single neurons in a specific vertical column that selectively respond to line orientation (Hubel
and Wiesel, 1968). Lines are basic feature detectors of object contours, and cells that respond
to line orientation may be the first step in perceiving the shape of an object. There is some
evidence that orientation columns have built-in properties because they exist in the primary
visual cortex of animals without light stimulation from birth (Wiesel and Hubel, 1965). Single
neuron selectivity for more complex forms, such as the outline of a face or a hand, has been
demonstrated in visual association areas (Desimone et al., 1984; Tanaka, 1997). It is unclear if
the detection of general configurations by single neurons is innate or acquired.

Our senses have built-in flaws that hinder a truly accurate representation of all that is in the
external world. There are two reasons for that. First, primitive sensory receptors (Fig. 13-7A)
evolved early in our animal ancestry as an existential system that reacted to stimuli that would
promote or hinder survival. Some stimuli from beneficial things—pleasant chemical stimuli
to recognize food or a mate—were attractants. Other stimuli from dangerous situations—
unpleasant toxic chemicals, wet nesting areas—were repellants. And to ensure that existential
stimuli were neither mistaken nor ignored, they were experienced as greatly magnified unique
signals, bitter or sweet, fragrant or putrid, red or green, and so forth. These original sensory
perceptions do not have detail, but are global in nature—strong odors and tastes, bright lights
and hues, loud and shrill noises, etc.—they are the raw sense data we use first to build a
representation of the world. Second, there was selective evolutionary pressure for extremely
accurate sensory representational receptors to greatly increase survival (Fig. 13-7B). Receptor
mechanisms had to undergo millions of years of natural selection to achieve sufficient acuity.
Only a few sense organs evolved: eyes send accurate images of external objects to the brain,
ears transmit a wide range of acoustic stimuli from other animals and natural phenomena
(wind, thunder, flowing water, etc.), touch receptors, especially on digits, transmit texture,
hardness, wetness or dryness, warmth or cold, etc. of objects. When visual and tactile sensory
inputs are combined, extremely accurate information is transmitted to the brain. But, this
small set of representational senses put limits on features in the external world that we can
detect. For instance, the visual pigment in our eyes is sensitive to only a few wavelengths in
the electromagnetic spectrum; most are not detectable. However, with our unique intelligence
and tool-building attributes, today’s humans have invented instruments that extend the senses
and tell us a great deal, not only about our immediate surroundings, but also about our earth
and even the universe.

How Do We Perceive Sensory Information and Know What Really Exists? There are three
theories: nativism, empiricism, and gestalt (insight) that deal with the source of knowledge
(Table 13-3). Nativism was first formulated in the West by Plato (1953a, b) who speculated
that the human soul is an intellectual power of divine origin endowing the individual with
knowledge the day it is born. But if so, why does the child need experience, education, and
training to become knowledgeable? To explain that, Plato offered his theory of reminiscence—a
prompting by the senses to retrieve what is already present in the soul in a dormant form.
More specifically, Plato believed that “Ideas” or “Forms” of everything that exists in the world are immanent in the intelligent soul; the individual learns to “recognize” particular things by matching what is perceived with the preexisting templates.

The contrasting idea of empiricism, also of ancient vintage and first advocated by Aristotle, was reformulated by Locke in the late 17th century. Locke asserted that at birth the infant’s mind is an empty slate (*tabula rasa*) and it is through sensory experience that it learns about the world and comes to understand it (Locke, 1965 [1690]). Sensory experience passively leads to the formation of “simple ideas” (such as whiteness or softness), the simple ideas become

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**EXISTENTIAL AND REPRESENTATIONAL SENSES**

**A. PRIMITIVE EXISTENTIAL SENSES**

Evolved early in animal life.

*Global non-detailed information* about the environment.

Vivid sensations about beneficial or harmful features in the external world with strong emotional relevance.

*Promote basic survival:*
- Help us find food, mates, comfortable living sites
- Help us avoid poisonous foods, recognize other animals that may be predators, and avoid unsafe living sites.

**B. ADVANCED REPRESENTATIONAL SENSES**

Evolved later in animal life

*Highly detailed information* about the environment.

Sensations used by cognitive systems in the brain to analyze and understand the basic features of objects in the external world.

*Promote extended survival:*
- Help us modify our environment to enlarge territories where we can live comfortably
- Help us find plentiful food supplies in many different climates

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**SMELL**

**VISION**

**HEARING**

**TOUCH**

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**Fig. 13-7.** The differences between existential and representational senses.
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compounded through association into “complex ideas” (such as substance), and through “reflection” (combination, comparison, imagination, and abstraction) ideas are elaborated into thoughts. Note that “whiteness” and “softness” are not what we now consider elementary sensations (like simply seeing something as white or feeling something as soft) but verbalized concepts of a simple kind. Later, Hume (1939 [1748]) argued that the elementary constituents of the mind are vivid “impressions,” lively traces left in the senses by external forces, and the impressions give rise through association to fainter “ideas” (percepts, memory images, concepts) and to thoughts. It was Reid (1764) who subsequently made the clear distinction between subjective sensations (Hume’s impressions) and objective perceptions and ideas. Thus, Locke’s empiricism was developed into a theory of mental chemistry, with sensations being the atoms of the mind and percepts and ideas their molecular products through the lawful operation of associations. Thomas Brown (1860 [1820]) listed three primary “laws” of association: contiguity, similarity and contrast, and several secondary ones, including

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TABLE 13-3 THEORIES ON THE SOURCE OF KNOWLEDGE

<table>
<thead>
<tr>
<th>THEORY</th>
<th>PROONENTS</th>
<th>TENETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATIVISM</td>
<td>PLATO</td>
<td>We are born with all knowledge and do not learn from experience. Instead, experiences trigger a recognition of the knowledge we already have. Everything we know is based on our inborn intelligence. Obviously, pure nativism is absurd and cannot be the sole source of knowledge.</td>
</tr>
<tr>
<td>EMPIRICISM</td>
<td>ARISTOTLE</td>
<td>At birth, our minds are a blank slate (<em>tabula rasa</em>), where our sensory experiences are written. Everything we know is due to experience and learning. This theory is the foundation of the scientific method, that true knowledge must come from gathering experimental data. But pure empiricism also cannot be the only source of knowledge. Indeed, Locke and Hume’s philosophies had some elements of nativism.</td>
</tr>
<tr>
<td>GESTALT PSYCHOLOGY</td>
<td>KANT</td>
<td>At birth, our minds have built-in templates (<em>a priori</em>) that enable us to interpret (perceive) sensory experiences as organized wholes (<em>Gestalt</em>) rather than individual punctate sensations. Perceptions are constructed with innate mental laws that determine the way objects are known and recognized. This theory is a balanced approach to the source of knowledge.</td>
</tr>
<tr>
<td></td>
<td>KOHLER</td>
<td></td>
</tr>
</tbody>
</table>
duration, frequency, recency, and liveliness. The combined image of a red apple and its good
taste, become associated in our minds as shared properties of the concrete concept of an
edible apple; things that are similar, apples and pears, become associated to form the abstract
concept of fruit; things that are dissimilar, carrots and sausages, become dissociated as two
types of edible things, vegetable and meat. The longer, more frequent, and more recent the
conjunction or apposition of two items, and the livelier the subject’s reaction to them, the
stronger will be the associative bond formed between them (Warren, 1921). Paralleling the
association theory of the empiricists, Pavlov (1906, 1927) used dogs to demonstrate that an
innate (unconditional) reflex, salivation when eating meat, can be modified if food delivery
is repeatedly associated with the presentation of a (conditional) stimulus, like ringing a bell.
These studies were followed by behavioral investigations on the acquisition of habits through
repeated experiences. Thorndike (1911) showed that caged cats learned to open a latch to
get food outside by prolonged “trial-and-error,” learning without any apparent “insight” on
problem solving. This led Thorndike to formulate his connectionist theory—neural bonds are
automatically formed between circuits that elicit useful movements, while at the same time
bonds are discarded in circuits of useless movements. An important new concept that entered
connectionist theory was the pivotal role played by motivation or reinforcement (reward and
punishment). These early studies, described in (Section 1.3.3), were later extended by the
behaviorists to explain sensory discrimination learning and other higher processes, including
problem solving and concept formation (Skinner, 1938; Hull, 1943).

However, neither radical nativism (everything we know is based on our inborn intelligence)
nor radical empiricism (everything we know is due to experience and learning) can give a
full account of human knowledge and understanding. Plato’s nativism is obviously absurd.
How could neonates have knowledge of the force of gravity, electromagnetic radiation,
artificial intelligence, electronic communication, and function of the nervous system? It is
inconceivable that the mind could be furnished at birth with all the concrete and abstract ideas
about the world. It is intensive education, training, accumulation of individual experiences,
and experimentation that gives us knowledge. But radical empiricism also has its shortcomings
since neither association psychology nor connectionist behaviorism provide a full account of
our perceptions and a less clear account of reasoning ability. Locke’s associationism is not a
pure empiricist theory, it admits the existence of an intelligent mind as the agency of experience
and invokes reflection as a mechanism in the formation of complex ideas. Active thinking and
reasoning cannot be explained by the passive operation of associative mechanisms.

The Gestalt psychologists (Max Wertheimer, Kurt Koffka, Wolfgang Köhler) pointed out
early in the 20th century that the association psychologists’ notion that patterned perceptions are
nothing more than compounded punctate sensations cannot be true (Hochberg, 1979). To begin
with, when we look at something or listen to somebody, what is present in our consciousness is
not an assembly of elementary sensations (a series of points of lights of different intensity and
color) but an instantaneous experience of their entire configuration (Gestalt). Apples and pears
are instantly recognized as such, and distinguished from one another, by virtue of differences
in their shape. The shape of things is the primary object of perceptual consciousness not their
specific sensory composition. Indeed, an object is recognized as the same thing while it moves
across the visual field and stimulates different retinal elements, a melody is recognized when
changed to another key and therefore excites a different set of cochlear receptors. It requires a separate, analytic process to make the sensory specifics of perceptual recognition and constancy possible. Finally, studies in higher animals cast doubt on the idea that all their behavior is explainable by rote learning. For instance, studies in chimpanzees gave clear evidence that they solve novel problems with insight (Köhler, 1924). The operation of cognitive processes could even be demonstrated in the spatial behavior of lower mammals, like the rat (Tolman, 1932). Learning is a major factor in higher mental processes, but it cannot by itself account for all of it; language is required in humans.

13.2.3. Thought Requires Language-Based Mental Activity. Words are the currency we use to think. We talk not only about our ideas with others but also talk silently to ourselves with long streams of internal thoughts. We have words for things that we perceive, words for abstract ideas, words to re-represent past experiences. And by using words that designate mental states, we engage in introspection about our feelings, about our successes and failures, about our strengths and shortcomings, and about our relationships with others in society. We begin this discussion by proposing that while our closest relatives, the chimpanzees, may entertain elementary thoughts and are able to engage in simple reasoning, they cannot reflect and meditate as we do because that is impossible without words. The ability to reflect upon what we are doing and to plan what we will do is the foundational difference not only between animals and man but also between different groups of human beings.

Concept Formation and Thinking Without Words. A widely held view from the early 20th century onward is that instinct controls animal behavior and reasoning controls human behavior. Chapters 7 and 8 reviewed studies amply demonstrating that monkeys and apes use reason to solve complex sensory discrimination tasks and difficult instrumental problems. On the basis of the available evidence, the intelligence of monkeys is limited. While they can form concrete, imagistic concepts—for instance, distinguishing between different categories of objects on the basis of their perceptual similarities or differences—they cannot form abstract relational ideas and fail to solve problems that require abstract reasoning (Section 7.4.2). Moreover, when monkeys solve instrumental problems, there is little evidence of insight or foresight (Section 7.4.4 but see, Martinho and Kacelnik, 2016). We concluded that while the most advanced monkeys display practical rationality in the pursuit of tangible rewards and are implicitly aware of what they are doing, they cannot reflect upon what they experience and therefore lack explicit consciousness.

Beginning with Wolfgang Köhler’s (1917) seminal research, it is well established that chimpanzees have enough intelligence to do some abstract reasoning. (Chapter 8). There is ample experimental evidence that chimpanzees use simple concepts and can appreciate means-to-ends relationships when challenged to solve a difficult task to obtain a reward (Sections 8.3.5, 8.3.6). But what is their thinking like? Let us for a moment consider an imaginary scene that might have taken place deep in a forest in the heart of Africa to a troop of chimpanzees with no prior experience of humans. One day, while the troop is browsing for food in the forest canopy, a small naked creature appears on the ground; it walks upright and carries in its hands a strange curved object with an arrow in its middle. The creature looks at them for a moment, moves its arm, and one of the chimpanzees falls dead to the ground. They cannot comprehend
what has taken place, and life goes on as before. The human re-appears a few days later and, again, one member of the troop collapses and dies. After these experiences, some chimpanzees get the idea that this upright creature is “dangerous.” When the human comes again, the first chimpanzee to see him gives an alarm call, the troop flees into hiding in the dense forest, and nobody is killed. Time passes, and one day a new upright-walking creature appears in the forest. His body is covered with strange materials of different texture and colors, and he carries on his shoulder a tubular sort of an object. If the chimpanzees fail to categorize this different upright creature as dangerous, some of them will get killed again. However, if some members of the group form the primitive concept that all upright-walking creatures belong to a dangerous category, an alarm call from these more intelligent chimpanzees will sound and the entire troop will flee without loss of a member. The ability to go beyond what is perceived to form a superordinate *generic* concept thus greatly aids the survival of the troop.

Let us now change this imaginary scenario and go to a modern-day zoo that houses a large chimpanzee colony in an enclosed compound. Masses of people stroll past the enclosure, some glancing briefly at the chimpanzees, others stopping and trying to engage the animals’ attention. Since the visitors pose no threat or benefit to the chimpanzees, they are ignored. But after a few hours, the bored chimpanzees sight a person approaching in the midst of the crowd. She is the experimental psychologist who has been testing them for weeks, giving them different tasks and rewarding them with delicacies whenever she seems satisfied with their responses. All of a sudden, the chimpanzees become alert and run into the space where the experiments are performed. This is an instance of forming a subordinate *specific* category, the singling out of one member of a class from all the others by some distinctive mark. Because of this dual process of categorization—generalization and particularization—dissimilar entities may be interpreted as similar, and a particular exemplar of similar entities as unique. Categorization of this sort is involved not only in cognitive processing but also in action generation. Take the case, as found in experimental studies, that chimpanzees will treat a rod in their cage as a “rake” when they try to pull in a reward placed outside; as a “pole” when they plan to climb over a vertical wall to escape from an enclosure; and as a “weapon” when they seek to kill a snake. Chimpanzees can accomplish this simple kind of categorization without having words because they can visually perceive the multiple utility of a rod. They learn by observation, imitate what they see, and can be trained to communicate with their caretakers by using hand signals or by touching computer icons to obtain desired rewards. They may even be able to form relational concepts that can be pictorially represented, such as “same” and “different.” All of these observations imply that chimpanzees can think and reason, but signal communication after *intense training* is not identical with the *spontaneous* language learning of human children—who use words as symbols of objects, events and abstract ideas, and link words grammatically to think and speak.

**The Scientific Evidence that Language is a Driving Force in Human Mental Evolution.** The primal characteristic of any human group is the existence of language. In Chapter 9.2.4. and Figure 9-15 we show that the necortical expansion in the human brain compared to the chimpanzee brain is mainly in the association areas, less so in the primary sensory and motor areas. The specific parts of the brain that are involved in language are the speech recognition area (Wernicke) and the speech motor area (Broca) shown in Figures 13-1A, 13-2B, and 13-3.
These association areas are difficult to find or may actually be missing in the chimpanzee cortex. Apparently there is not enough mass in the chimpanzee cortex to support spontaneous language communication. Our hypothesis is that the great expansion of association areas in the human neocortex increased intelligence from ape-men, to hominids, to archaic and modern humans and is the neural basis of language.

What natural selection pressures increased neocortical size to support the emergence of language? The work of Aiello and Dunbar (1993) links relative neocortical volume to two variables that increased during human evolution, group size (Fig 13-8A) and the estimated grooming time required to maintain social adhesion (Fig. 13-8B). We postulate that as hominids evolved, the intelligence of some populations was superior to other populations; the more intelligent populations grew larger compared to other groups because more of them survived. But Aiello and Dunbar advance the hypothesis that large groups have two problems. First, group size is limited by the number of relationships that each member can handle. A smaller neocortex means fewer individuals can participate in the group. For example, living great ape troops usually have between 60 and 70 individuals. It is estimated that Australopithecine groups are approximately that size, putting them squarely within the current living great apes; the volume of the Australopithecine neocortex is also within the same range as the living great apes. Studies on human hunter-gatherer *Homo sapiens* societies, with a much larger neocortical volume ratio, indicate that most contained between 90-220 members. These larger groups required a new form of communication—language—to assure that individuals can effectively participate in the tasks of staying alive. Second, primate groups maintain social cohesion by grooming each other—physical one-on-one contact. Having to groom many members takes too much time away from looking for food and dwelling places safe from predators. Once the required grooming time exceeds 20%, a new form of vocal communication is necessary that is time-efficient. Again, the Australopithecine grooming time is less than 20%, within the same range as the living great apes. When the estimated grooming time exceeds the 25% level, language becomes more and more essential. From a careful analysis of the hominid fossil records, Aiello and Dunbar support the idea that language developed gradually by slowly enhancing the communication systems of earlier primates. A true language probably emerged during the middle Pleistocene (Calabrian and Ionian stages, 1.7 to 0.5 million years ago) in a few advanced populations of *Homo habilis* (neocortical volume ratio 3.44) and in all populations of *Homo erectus* (neocortical volume ratio 3.76). Between 200,000 (Tarantian Pleistocene) and 70,000 (Holocene) years ago, the neocortical volume ratio in various populations of *Homo sapiens* ranged from 3.95 to 4.06. Living humans have a neocortical volume ratio of 4.02. That enlarged neocortical volume supports the use of a complex language.

*The Formation of Abstract Ideas and Thinking with Words.* Language—a complex verbal communication system—immensely expands the scope of human thinking and reasoning by providing a vocabulary—the body of words used in a language—to communicate all of our knowledge to other members of our society. In addition to sensations, feelings, perceptions, and memory images, words (reified summaries of complex ideas and things) vastly expand our mental life. Silent words compose thoughts; spoken words verbalize thoughts; words are the basis of human cognition. All languages have rules (grammar) for combining words into sentences—a grammatical unit of one or more words that expresses an independent
statement, question, request, command, or thought. Words are single elements of speech, and each language has approximately 7 categories. (1) Nouns name persons, places, things, events, substances, or qualities. (2) Verbs describe a physical action, a mental action, or a state of being. (3) Adjectives are descriptive words that modify nouns, while (4) adverbs are also descriptive words that often modify verbs. (5) Pronouns are words that stand in for nouns that have been previously used (the antecedents) and function to shorten our speech by not having to repeat nouns. (6) Conjunctions are words that connect groups of words to each other within a sentence. (7) Prepositions link words (usually nouns) in time and space within sentences. Every human society has a language, indeed, it is the distinguishing characteristic of human groups as opposed to animal groups. The total number of languages is estimated to be between 5,000 and 7,000 (wikipedia.org/wiki/Language).
Chomsky (1965) proposed the hypothesis that the human brain has a built-in language acquisition device. Skinner (1938) does not accept any built-in learning mechanisms and insists that all learning comes from experience. Common sense shows both innate ability and experience are required for language learning. It is of great significance that learning a language—like that of many other complex skills—has a critical period, being easiest in early childhood, still easy in most people during the teen years, more difficult in adults, and most difficult in old age. During the last 6 weeks of pregnancy, infants learn to recognize the sound of their mother’s voice (DeCaspar et al., 1994). According to the language development page on parents.com, every toddler is slightly different, but there are some general milestones. Vowel and consonant babbling occurs between 8-10 months, and most toddlers begin to speak individual words at 12 months. By two years, average toddlers have a vocabulary of about 50 words that they put into short phrases (“my ball”) and understand the meaning of “me” and “you” pronouns. They also should know their body parts and be able to point to them when asked. Vocabulary is enhanced by saying words and having toddlers repeat them. By age 3, toddlers should be able to speak clearly in simple sentences, request items by naming them rather than pointing to them, and follow more complex instructions. Complex sentence structure comes in by age 4 and words are more clearly spoken so everybody can understand them. The older toddler can identify colors, shapes, and letters. They also understand the concept of time, and can follow complex, multi-step instructions. Putting toddlers into preschool significantly improves their language skills when they reach formal school age (Fig 13-9A). The environment in the home markedly affects language development. Many studies have shown language skills correlate well with income level (Fig. 13-9B) dividing the students into groups that qualify or do not qualify for a free lunch, no matter if they live in rural areas, the suburbs, or the city.

Conceptualization combined with language, has had an immense effect on the personal and social evolution of man because of its endless applications and benefits. Language is the foundation of culture and is responsible for our success as a species on earth. Language is an interrogatory instrument that enables the inexperienced person to build his fund of knowledge and develop his comprehension of the world by asking questions, requesting guidance, and seeking counsel. Language is an educational instrument that allows experienced people to communicate their knowledge of facts, technical expertise, social norms, moral values, religious beliefs, and political ideas to others in a group through teaching and training. Thus, language serves as a powerful culture-propagating medium. Language is a negotiating instrument that enables people to resolve their conflicts through discussion and argument rather than through physical coercion and violence. Language can help turn aggressive, jealous, and resentful individuals into civil beings. Language is a broadcasting medium that makes sharing vital information about available opportunities and looming threats to an individual or to a group. Language is a medium of entertainment when used for gossiping, describing interesting experiences, or sharing tales about events that took place in the distant past or in far-away lands. Narration is the basis of folklore, legends, and myths that have contributed much to the preservation of a society’s belief system and moral values. Language can help us to rationally interpret the significance of current events by using abstract concepts and logic. Finally, we use language to meditate not only about the outside world and its ways but also about ourselves—why we feel and act the way we do and who we are.
The anthropological and historical evidence clearly establishes that the language of reflection does not guarantee comprehension of reality in the external world. For a long time, the human worldview in various early cultures was based on preconceptions and myths engendered by fear and hope rather than on factual evidence and critical reasoning. A worldview based on information gained through scientific observation, exploration and experimentation took a long time to develop. In Western Culture, science began during the Renaissance. Its
development is associated with the widespread adoption of intensive childhood education, a prerequisite for successful participation in our world of extreme division of labor with endless numbers of vocational and professional specializations. In the West, education has undergone a slow but profound change in the last thousand years.

**Inner Speech, Reflection and Self-Consciousness.** As higher mammals subjectively experience their world, they construct practical knowledge or tacit awareness of their situations. For example, when a dog playing in the yard gets hungry, it can use its recollected search image to proceed to the food dish in the kitchen or, if it desires something more palatable than its home fare, may visit the neighbor’s house where it is always welcomed with some savory reward. Tacit awareness is operating when we drive a car, adjust the steering wheel as needed, increase or decrease speed, and change gears as necessary. But thanks to verbally-mediated thinking and reasoning, our mental life is not confined to tacit awareness. Many of our waking hours are free to be explicitly aware of past events, current events, and future plans. By using words to describe these subjective experiences, we re-represent them in the theater of our consciousness as reified entities to think and reason about. As a result, we not only become familiar with what goes on around us and deal with that in an efficient manner, much like higher animals do, but we can also seek to interpret and speculate about why events turned out one way or another and how we may change them to better suit our needs. Such planning is possible because of our ability to silently “talk” to ourselves, imagine and rehearse what we want to achieve, and how to go about doing it. Indeed, inner speech allows us to do much more than make practical plans and execute them. Unlike nonverbal animals, we can use inner speech to reflect not only about what goes on in the outer world but also in our inner world. Once we have acquired an adequate vocabulary of words that refer to abstract ideas, we can reason both about the temporal, spatial, and causal relationships that prevail among objects and events, and the motives and reasons that govern the behavior of people around us. And beyond an examination of what transpires in the minds of others, we can engage in introspection and reflect upon our personal motives, reasons, hopes, fears, etc. While self-feeling is a universal property of all sentient beings, as reflected in their struggle for survival and the protection of what they possess, self-knowing—the I, me and mine of self-consciousness—is a unique, reflection-based human attribute. Self-consciousness emerges with the explicit realization of the difference between: the sights and smells of things out there, the mental functions of seeing and smelling, as well as remembering, believing and knowing, the mental processes inside us. This realization—which evolved gradually in hominids and develops slowly in the child—eventually leads to the conscious appreciation of the difference between the inner self as the perceiver and actor, and the external world of objects and beings.

In this section, we dealt with the collective abilities that human beings share. But each one of us is a unique individual having a unique personality. According to our neuropsychological theory, there are three basic mental operations that motivate and guide individual behavior: (Section 13.3.) our emotional temperament (nature), (Section 13.4.) our character traits acquired from rearing conditions and educational opportunities (nurture), and (Section 13.5.) our intelligence to make an appropriate career choice that uses our talents (autonomy). There is strong scientific evidence that emotional predisposition and basic intelligence have definite genetic components, while character traits are environmental. These three factors
play major roles in an individual’s personality development. How do they interact with each other to produce individual mindsets (personal values) and lifestyles? The rest of this chapter is devoted to discussing our individual differences and their effects on our societies. This issue is a critical one in our complex age because there is a great need for individuals to fully develop their special talents and make their unique contributions to society. Indeed, individual differences provide an endless reservoir of behavioral innovations that create progress. The more that our societies foster development of each person’s talents, the more successful our species will become.

13.3. Individual Differences in Temperament

The concept of temperament is a very old one; the word originates from the Latin temperare-“to mix” and temperamentum-“to mix properly.” Temperament is usually described by such emotional terms as impulsive or collected, extroverted or introverted, cheerful or morose. The ancient physicians, from Hippocrates (460-370 BCE) to Galen (131-200 CE), believed that there were four types of temperament: (1) sanguine (flighty, pleasure-seeking), (2) choleric (aggressive, ambitious), (3) melancholic (serious, suspicious), and (4) phlegmatic (relaxed, thoughtful). The four temperaments were based on the fanciful notion that differences in the levels of four bodily “humors:” blood, yellow bile, black bile, and phlegm constituted specific temperaments. This classification was popular throughout the Middle Ages. And while the attribution of temperamental differences to these body fluids has been abandoned, the classification remains popular to this day.

13.3.1. The Emotional Basis of Temperamental Traits. The association of emotion and temperament is a relatively new idea. Although the Greek and Roman philosophers, particularly the Stoics, were very much interested in the role of emotions (pathos, passion) in human conduct and the problem how to control them, emotions were not generally conceived of as a distinct faculty but rather as a corruption of reason by bodily appetites and bad judgment. There were exceptions. For instance, Galen (2nd century CE) described temperament in his De temperamentis as the emotional aspect of the soul, and noted that individual differences in temperamental traits are already evident early in childhood. As he wrote:

The point of my entire discourse is the knowledge of the differences which can be seen in little children and which reveal to us the faculties of the soul. Some are very sluggish, others violent; some are insatiable gourmands, others quite the contrary; they may be shameless or shy; and they display many analogous differences.

(Quoted from Diamond, 1957, p. 604)

The scholastic philosophers, such as Thomas Aquinas, developed the idea that some emotions were a distinct mental faculty. In his Treatise on the Passions, Aquinas distinguished between two kinds of bivalent emotions: concupiscent (love and hate, desire and aversion), which he related to appetites; and irascible (confidence and fear, hope and despair), which he related to the cognitive evaluation of one’s circumstance or predicament (King, 2002). Linking temperament to emotional disposition was a later development. For instance, the 19th century educational philosopher Johann Friedrich Herbart described temperament as “the sum total of one’s affective qualities as they impress others” (Quoted from Roback, 1952, p. 155).
Although behaviorists in the early 20th century denied the existence of inborn temperamental traits (arguing that all personality attributes were products of conditioning and learning), two findings in the mid-20th century strengthened the idea that temperament was an inborn trait and related to emotions. First, emotions are distinct functions mediated by older subcortical brain structures (Hess and Brügger, 1943) in contrast to cognition that is mediated by the newer neocortex. Second, there is accumulating evidence that temperamental traits have a particularly strong and enduring genetic component. For instance, Birns et al (1969) reported that different levels of distress in neonates predicted tendencies for distress at 1, 3, and 4 months of age, a finding that was later extended to 2 years (Riese, 1987) and 7 years of age (Rothbart et al., 1994). In a large scale longitudinal investigation, Thomas and Chess (1977) found enduring dispositions from childhood to adulthood in such temperamental traits as low and high activity level, tendency toward approach or withdrawal, and positive or negative mood. This association between emotions and temperamental traits is clearly expressed by Campos and his associates when they write:

… all human beings will manifest fear, joy, anger, interest or decreased activity, and so forth. These are normative aspects of emotion. However, some show a very low threshold for fearfulness, and others a high one. Some will show anger long after the provocation, others will calm quickly. Some will be very active in most situations, whereas others are quiescent. (Campos et al., 1983, p. 830)

A similar conception of temperament was offered a decade later by the same group of investigators, stressing two points: the early origin of emotional dispositions and temperamental traits, and their pivotal role in personality development:

We believe temperament constitutes the “emotional core” of later personality characteristics. Thus, we should ultimately be able to specify a course of development whereby early proneness to anger predisposes to later aggressiveness. These transformations will be probabilistic tendencies rather than deterministic blueprints. (Goldsmith et al., 1994, p. 242.)

**Complex Interactions between Emotions and Cognition.** The empiricist philosophers (see James, 1890) think that emotions are secondary processes derived from primary mental processes like perception, thought, and reasoning. In their view, emotions are based on the cognitive evaluation of what is beneficial or harmful to the individual. When cognition fails under stress or in emergency situations, raw emotions control behavior. The opposing biological or evolutionary theory consider emotions are primary mental processes that govern behavior, while cognition is an ancillary mechanism. That view, first proposed by Schopenhauer, was later popularized by Freud (1927) and Cannon (1915), and more recently elaborated by Plutchik (1980). Defending the cognitive theory, Arnold (1960) and Lazarus (1991) have argued that feelings and emotions are always preceded by the cognitive evaluation of a given stimulus or situation as either beneficial or harmful, and it is that evaluation that produces the emotional reaction. When I am threatened by a ferocious dog, the idea that the dog could bite me will make me become frightened, and I withdraw in a panic. However, if I perceive that the dog is on a heavy chain and therefore cannot do me any harm, I do not become emotional and walk calmly past the dog. It is the cognitive assessment of the situation that determines whether or not I get emotionally aroused. Another variant of cognitive theory of emotions is
the idea that becoming emotional is a sign of behavioral disorganization or breakdown, and the inability to face a problem calmly and rationally (Claparède, 1928). If I know that I can cross the street before a distant car gets close, I will walk across calmly. But if crossing the street absentmindedly I suddenly hear the roar of a car’s engine and the screeching of the tires, and do not have the time to think what to do, I become stricken with panic. Emotional responses can be beneficial: when I hear the roar of the oncoming car and run swiftly to the sidewalk, I save my life. But perception need not always precede emotional arousal. For instance, I may swiftly respond emotionally to an intense stimulus, such as the bang of a thunder or the flash of lightning, that prior cognitive evaluation of the threat is most unlikely (Zajonc, 1980).

From a broader perspective, cognitive theories fail the phylogenetic and ontogenetic test. They cannot explain how lower animals lacking perceptual powers and cognitive abilities become emotional, or how inexperienced neonates and infants of higher animals, including humans, can have feelings and emotions. They may deny that animals or infants have emotions, but endocrine, physiological, and behavioral evidence support the contrary theory. Newborn animals (Young, 1961) and humans (Ganchrow et al., 1983) devoid of any prior experience ingest sweet fluids voraciously but reject or eject bitter fluids, suggesting that they have an inborn liking for the one and a dislike for the other. It is inconceivable that these basic affective reactions have a cognitive origin, that the newborn can appreciate that sweet milk is nourishing (“good”) and it is therefore perceived as pleasurable, and that milk adulterated with quinine is poisonous (“bad”), and is therefore perceived as disgusting.

To resolve the controversy, we postulate that feelings and emotions may be activated in two ways: swiftly by elementary sensations as bottom-up reactions, and somewhat more slowly by cognitive perceptions as top-down processes (Fig. 13-10). For instance, responding to food

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**EMOTION ACTIVATION SYSTEMS**

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<thead>
<tr>
<th>BOTTOM-UP EMOTIONS</th>
<th>TOP-DOWN EMOTIONS</th>
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<tbody>
<tr>
<td>1. Involuntarily triggered by inborn stimuli</td>
<td>1. Modified by conditioning and individual experience</td>
</tr>
<tr>
<td>2. Swift activation</td>
<td>2. Slow activation</td>
</tr>
<tr>
<td>3. Not dependent on cognition</td>
<td>3. Dependent on cognition</td>
</tr>
<tr>
<td>4. Processed in the paleocephalic brain and brainstem</td>
<td>4. Processed in the neocortex and limbic cortex</td>
</tr>
<tr>
<td>5. Freud’s Id</td>
<td>5. Freud’s Ego</td>
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</table>

**Fig. 13-10.** Our scheme for the two types of emotional activation systems.
deprivation with hunger, or to tissue damage with pain, are involuntary bottom-up processes, and so are the emotional responses of lower animals without cognitive faculties and of naïve neonates of higher animals. In higher animals like monkeys, feelings and emotions are often top-down processes. When a monkey engages in a dominance fight with one individual and follows it by grooming another, its anger toward one and cordiality toward the other are obviously top-down processes that serve utilitarian ends. The biological and cognitive theories of emotion can be reconciled if one accepts the following propositions. (i) Emotion and cognition are two separate control systems of behavior, obeying different operational principles. This is in line with Freud’s (1927, 1933) distinction between the pleasure principle (hedonism) of the Id and the reality principle (utilitarianism) of the Ego. (ii) Emotions and cognition are mediated by two different neural systems with different phylogenetic and ontogenetic histories. The paleocephalon, the principal neural mechanism of the inborn emotional control system, evolved before the neencephalon, the learning-based cognitive control system. (iii) In higher animals and man a complex interaction develops between emotional and cognitive processes with each modulating the other. This interaction is greatly dependent on the interface between the limbic system and the temporal-cortical and frontal-cortical integrative mechanisms of cognition. Emotion-cognition integration has been studied by Leventhal (1987) who proposed that, during human mental development, there are three stages in the differentiation of emotions. (1) Emotions are involuntarily triggered by a set of inborn stimuli. (2) Emotions become modified by conditioning and individual experience. (3) Emotions are consciously perceived and become integrated with cognitive processes.

**From Bivalent Emotions to Temperamental Traits.** According to our neuropsychological theory, the foundations of an individual’s personality are his inborn affective dispositions. Therefore, to understand individual differences in mindset and lifestyles we have to begin by examining the diversity of human emotions. Common sense supports the attribution of temperamental traits to an evolutionary heritage of feelings that come in positive/negative couplets. For example, like and dislike, pain and pleasure, love and hate, fear and anger, curiosity and boredom, and so forth. These are enduring temperamental traits that generate mindsets and lifestyles—hedonism and narcissism, sensation and thrill seeking, altruism towards members of one’s own family, clan or tribe but hostility and aggression towards outsiders. These emotional aspects of our personalities are modified but not obliterated by learning, thinking and cultural influences. Anger leading to aggression is a natural emotional reaction to insults or frustrations. But we are familiar with individuals who will go out of their way to pick a fight. The aggressive individual may intimidate or attack others not only to get what he wants, or to gain some personal advantage, but also to exhibit his power and superiority. He may be the child who picks a fight on the street corner; the drill sergeant who drives his men to exhaustion; the soldier who takes pleasure in killing the enemy; the spectator who enjoys the violence in a boxing match; the sadist who derives pleasure from torturing his victim; the arsonist or terrorist who enjoys creating havoc. On the other hand, there are timid individuals who will worry about danger when they are safe. While fear elicited by real danger leads to a normal reaction to flee or hide, the fearful person will avoid places where there is no danger. Examples include not getting near windows in skyscrapers; not speaking out in public to keep from sounding silly or uninformed; becoming panic stricken when traveling on an airplane.
Based on anatomical, physiological, endocrine, and behavioral evidence we postulate that several of our bivalent emotions are an ancient heritage, involved in the control of the behavior of such primitive vertebrates as fish (Chapter 3, p. 162). Obviously, we cannot directly determine what fish experience subjectively but we attribute several emotions to them for the following reasons: (i) facets of fish behavior are accompanied by endocrine functions and autonomic reactions that we associate with emotions; (ii) fish display a series of distinctive emotional expressions that conspecifics can recognize and respond to; and (iii) the brains of fish contain several of the structures (hypothalamus, septum, amygdala,) that we associate with emotional behavior in man. Specifically, we postulated on the basis of the evidence that fish experience pain when injured, distress when captured, hunger and appetite when food is deprived, disgust when ingesting toxic substances, fear when threatened, and anger when frustrated. These ego-centered emotions serve the goal of self-preservation. Some species of fish also display two inborn socially oriented emotional reactions. First, they seek each other’s company when they school, reflecting amicability; second, males and females interact with each other during the breeding season in the form of courtship display and behavior, which reflect amorousness.

If we now take a big evolutionary leap and consider the behavior of monkeys and apes, we find that in addition to the egotistical emotions found in fish (as well as in amphibians and reptiles) they also display several prosocial emotions that are far more developed than in lower vertebrates (Chapter 7). Like many other mammalian species, monkeys display intense, mutual maternal/filial attachment, which in its overt expressions is indistinguishable from what we call in humans, affection and love. The solicitous caregiving of the simian mother for her young endures for several years, in some cases for a lifetime. The social life of monkeys is also far more elaborate than that of lower vertebrates, many of them forming large, kinship-based groups. The neuropsychological evidence indicates that the social relationship of most primates, as in all emotion-based activities, is bivalent, with amicability alternating with hostility, mutual grooming with fighting as circumstances change. As we have argued, most monkeys are egosocial animals, each grabbing whatever they can for themselves, using physical strength and social status to do so. But they also are allosocial when they seek appeasement from each other while relaxing and enjoying each other’s company (Section 7.1.4). Although sharing is better developed in humans than in monkeys, the allosocial mindset is our enduring simian affective heritage. This conclusion counters Hobbes’ (1651) claim that all human activities are motivated by selfishness, and what appears like benevolent behavior is calculated to generate some benefit.

13.3.2. Factor Analysis of Individual Differences in Temperamental Traits. Based on his factor analytic studies, Hans Eysenck (1947; Eysenck and Prell, 1956; Eysenck and Eysenck, 1985) maintained that two major factors determine an individual’s temperament: Extroversion and Neuroticism. Extroversion (E) is the bipolar dimension between extremes of stimulus seeking and stimulus avoidance, and Neuroticism between emotional instability and emotional stability. He related these traits to the Hippocratic four-factor model that is illustrated in Fig 13-11 in a Cartesian coordinate system. Eysenck attributed the extroversion dimension to strong or weak neocortical activation, the neurotic dimension to strong or weak limbic system activation. (In his later publications Eysenck added a third factor, Psychoticism, the bipolar
scale between aggressiveness and cautiousness.) McCrae and Costa (1990), based on some earlier research by others, extended Eysenck’s two-factor theory into one with five factors as shown in Figure 13-12. These personality traits, often referred to as the Big Five, tend to endure over the lifetime of the individual, with conscientiousness and agreeableness becoming more pronounced, and openness, extraversion and neuroticism decreasing with age (Soto et al., 2011). Actually, the McCrae and Costa five-factor model is an admixture of temperamental traits: extroversion, agreeableness, and neuroticism, character traits: conscientiousness, and an intellectual trait: openness to experience. But as a comprehensive list of personality factors, it does not include aggression, learning ability, and intelligence.

Approaching temperamental differences from a broader psychological and theoretical perspective, Buss (1988) lists seven temperamental traits (Fig. 13-13). Activity is defined as speed, vigor and persistence of motor activity; the apparent energy invested in behavioral acts. As a trait, it has been related to levels of physiological arousal, energy mobilization, and emotional reactivity. Individuals with leadership qualities must be high on this personality trait. Fearfulness is manifest in the distress displayed by some individuals in unfamiliar situations, the tendency to avoid taking risks, and neophobia. Fearful individuals tend to be docile, sedentary, and seek anonymity. Impulsiveness is evident in poor emotional control, the tendency to react on the spur of the moment.

**Fig. 13-11.** The temperamental scheme of Eysenck and coworkers.

**Fig. 13-12.** The temperamental scheme of McCrae and Costa.

**Fig. 13-13.** The temperamental scheme of Buss and Plomin.
moment, and the inability to delay gratification. It may be associated with flightiness and inattentiveness. Sociability is the preference to affiliate with others rather than to be alone. Nurturance is related to sociability, the inclination to help others in need. Aggressiveness is the disposition to threaten or attack others upon the least provocation. Dominance is the tendency to seek and maintain high social status. The correlation coefficients for test items within these traits are in the neighborhood of 0.50, and are resilient over time from childhood through adulthood to old age (Roberts and DelVechhio, 2000; Henderson and Wachs, 2007). However, they are far below the 0.95 correlation coefficients obtained for somatic traits, such as height, suggesting that inherited temperamental traits are subject to epigenetic (intrauterine) and environmental (postnatal) influences.

### 13.3.3. A List of Bivalent Emotions and Corresponding Temperaments.

Table 13-4 summarizes our conception of the links between bivalent emotions and temperamental traits. The list of emotions on the left corresponds to that presented in Chapter 7 for simians (Table 7-1, p. 388). The simian emotions we described in Chapter 7 as a primate heritage are very similar to our basic emotions, and they are the foundation of our individual temperamental differences. The same autonomic, endocrine and neuroanatomical mechanisms are involved in the generation of basic emotions in monkeys and humans. We differ from monkeys in four ways: (i) the power spectrum of some of our inherited emotions; (ii) the greater elaboration of basic emotions; (iii) the greater control of emotions by cognitive brain mechanisms; (iv) the important role played by cultural influences in the display of basic emotions.

The power spectrum of basic emotions in which humans differ from simians applies in particular to curiosity and the drive for instrumental competence. Monkeys and apes pay brief attention to novel objects and examine them to see if they are edible or not; they also use simple tools, like rocks to break a nut or turn twigs into probes to attract termites and ants. But monkeys will not spend much time examining a nonedible object, say a rock, to see what can be done with it, see how far it can be rolled or thrown toward a particular target, let alone fashion it to serve as a tool or weapon. We also differ from monkeys in other basic emotions; our greater cognitive powers, language use, and cultural influences elaborate basic emotions and turn them into sentiments. These include: moral sentiments such as pride and shame, remorse and guilt, respect and admiration; and aesthetic sentiments such as wonder and awe, the appreciation of the beautiful and sublime in nature and art. These sentiments are culturally conditioned (acquired) traits rather than fundamental (inherited) emotions.

As we noted earlier, Buss (Buss and Plomin, 1984; Buss, 1988) described seven temperamental traits: activity (vigor), fearfulness, impulsiveness, sociability (extroversion), nurturance, aggressiveness and dominance. Our list of simian emotions are synonyms of, or close in meaning to, those in their list and some that are not in their list. In our opinion, the discrepancy is due to inconsistency in the Buss and Plomin list. For instance, they reported fearfulness and aggressiveness as separate traits, although the two are evidently related to the bivalent emotions of fear and anger. On the other hand, sociability (extroversion) is not contrasted with its binary opposite of solitariness (introversion) in their system, and dominance is not contrasted with submissiveness.
Chapter 13: Personalities and Societies

Activity and passivity as affective traits. Drive force and energy level are dimensions of all emotions that manifest themselves as temperamental traits. This temperamental dimension distinguishes energetic and active individuals who tend to become leaders from passive individuals who tend to become followers. Buss (1988) distinguished four aspects of the trait he referred to as “activity:” tempo, vigor, endurance and drive. The tempo of active individuals refers to their speed of movements; they put a lot of force into what they do; they talk endlessly, gesticulate a lot, and may pace up and down while talking. The vigor of active individuals refers to the amplitude of their actions. They talk loudly, walk at a brisk pace, and work fast. Active individuals also show endurance; they persist in their tasks, rest little

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<tr>
<th>CATEGORY</th>
<th>+/-</th>
<th>EMOTION</th>
<th>TEMPERAMENT</th>
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<tbody>
<tr>
<td>Ecological (habitat)</td>
<td>+</td>
<td>Comfort</td>
<td>Coziness</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Discomfort</td>
<td>Uneasiness</td>
</tr>
<tr>
<td>Metabolic (food getting)</td>
<td>+</td>
<td>Hunger</td>
<td>Hungriness, appetite arousal</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Satiety</td>
<td>Fullness, appetite suppression</td>
</tr>
<tr>
<td>Dietary (food consumption)</td>
<td>+</td>
<td>Relish</td>
<td>Hyperphagia</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Distasteful</td>
<td>Hypophagia</td>
</tr>
<tr>
<td>Procreative (sexuality)</td>
<td>+</td>
<td>Lust</td>
<td>Hypersexuality, sensuality</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Repugnance</td>
<td>Hyposexuality, chastity</td>
</tr>
<tr>
<td>Protective (self defense)</td>
<td>+</td>
<td>Anger</td>
<td>Aggressiveness</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Fear</td>
<td>Timidness</td>
</tr>
<tr>
<td>Social</td>
<td>+</td>
<td>Friendliness</td>
<td>Amiability, congeniality</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Solitariness</td>
<td>Lonliness, reclusiveness</td>
</tr>
<tr>
<td>Parental (caretaking)</td>
<td>+</td>
<td>Filial love</td>
<td>Defensive, protective</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Loss, anxiety</td>
<td>Grief, intensive sorrow</td>
</tr>
<tr>
<td>Inquisitive</td>
<td>+</td>
<td>Curiosity</td>
<td>Investigativeness</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Boredom</td>
<td>Unresponsiveness, passiveness</td>
</tr>
<tr>
<td>Effective</td>
<td>+</td>
<td>Exuberance</td>
<td>Cheerfulness, enthusiasm</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Apathy</td>
<td>Lassitude, listlessness</td>
</tr>
<tr>
<td>Constructive</td>
<td>+</td>
<td>Confidence</td>
<td>Courageousness</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Uncertainty</td>
<td>Uneasiness, doubtfulness</td>
</tr>
<tr>
<td>Imaginative</td>
<td>+</td>
<td>Creative</td>
<td>Visionary, artistic</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Uncreative</td>
<td>Dull, uninnovative</td>
</tr>
<tr>
<td>Contemplative</td>
<td>+</td>
<td>Thougful</td>
<td>Meditative, introspective</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Frivolous</td>
<td>Flippant</td>
</tr>
</tbody>
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**TABLE 13-4: BIVALENT EMOTIONS AND CORRESPONDING TEMPERAMENTS**
and intermittently. Finally, active individuals are driven; occasional setbacks or failures do not stop them. Passive individuals, in contrast, display a slow tempo, low vigor, and little endurance and drive. They prefer to listen rather than talk, have to be prompted to work and procrastinate in doing what they have to do, work sluggishly, take many breaks, and prefer to have things done for them rather than do it themselves. Trait differences, we shall argue, are important. Active individuals, the loud minority, are the people who modify and change the social and political order. Passive individuals, the quiet and docile majority, sustain and preserve the culture. That is how active individual mindsets and lifestyles can become a force that changes the ethos of a culture.

Activity level is an inborn and enduring temperamental trait. An extensive longitudinal survey has shown that the more active an infant is at 6 weeks of age, the greater the probability that he or she will become an active child at 2-4 years (Hagekull, 1994). Objective studies with mechanical activity meters showed that there is a correlation between children’s motor output at 2 years and the vigor they display at play at 7 years (Halverson and Waldrop, 1973). Genetic studies based on self-reports and parental assessments indicate a concordance of activity level of 0.62 for identical twins but only 0.09 for fraternal twins (Buss and Plomin, 1984). The parental rating of the difference in the activity level of identical and fraternal twins was confirmed by an objective study with mechanical recorders (Saudino and Eaton, 1991).

Hypersexuality and hyposexuality are also absent from Buss and Plomin’s list. Treating sexuality as a temperamental trait is more problematic because of the difficulty of assessing it, except in extreme forms. While the organic origin of sexual drive is beyond any doubt, its intensity and the way it becomes manifest in daily life is influenced by a great variety of organic, personal and environmental factors. Hormones released by the testes and ovaries control sexual maturation (puberty), the development of secondary sex characteristics, and the rise of the sex drive, libido. Sexuality is also dependent on brain mechanisms that release gonadotrophic hormones, control several psychological factors (like mood states), and control social factors (like mores and moral principles; Bancroft, 2009). Low testosterone levels in adult males cause declines in sex drive, and pharmaceutical agents that lower testosterone levels reduce the intensity of hypersexual disorders. There are considerable gender differences in the intensity of sex drive (Kinsey et al., 1948, 1953). In addition to biological factors, the motives that make males and females engage in sex may be different: sexual activity in men may be a form of aggression, proving one’s virility; sexual activity in females is a way of gaining security (Feingold, 1994). Sexual emotion is an important factor in bonding two individuals, more often of the opposite sex but also of the same sex in a fair proportion of cases. There is evidence that sexual orientation begins early in life and is an enduring personality trait. But there are no indications that parenting or early childhood experiences play a role in homosexual orientation: most gay and lesbian adults have heterosexual parents, and most children raised by homosexual partners grow up as heterosexuals. Bailey and Pillard (1991) reported that 52% of identical twin brothers but only 22% of fraternal twin brothers were concordant for homosexuality. According to a large-scale recent study, genetic effects account for 0.34-0.39 of the variance in male homosexuality; the shared environment has no influence; and the individual-specific environment accounts for 0.61-0.66 of the variance (Långström et al., 2010).
ENVY, JEALOUSY, MALICE, AND SPITE. Envy and Jealousy results from interpersonal relationships that share an element of anger or hatred. We may be envious of someone who has something we don’t have but would like to have. We may be fearful and jealous that someone may rob us of a prized relationship, such as another’s love (Neu, 1980; Mullen and Maack, 1985). Both are specifically human emotions because they have strong cognitive components; nonetheless, they are powerful emotions that may preoccupy the affected individual for a long time and make him engage in irrational behavior. In envy there is concern with self-esteem, the envious person wants to be as handsome or as popular as someone else, to own a house as big as someone else, to drive an expensive car like someone else, etc. The jealous individual has something precious but fears losing that to a rival, like the affection of parents or the love of a partner. The jealous child worries that his parents love his siblings more than they love him; a jealous husband is consumed by the fear that his wife may love someone else. While envy usually involves only two individuals, the self and the rival, jealousy involves three, the lover, the loved one, and the rival. Moreover, in envy the hatred is directed toward the rival, whereas in jealousy the principal target of hatred is the loved one. The emotions of the jealous person oscillate between love and hatred, the desire to possess and the desire to destroy. Because of this ambivalence, the jealous person’s torment becomes a consuming passion and often leads to violence. Commonly, the partner rather than the rival is the target of violence. A study of over 70 cases of jealousy that led to homicide showed that only five of the suspected rivals became the victims of that extreme violence (Mowatt, 1966).

13.3.4. Gluttony, Laziness and Drug Use. Seeking pleasure and avoiding pain are basic emotional dispositions that all of us share. If pleasure seeking is a particularly strong inclination that is not constrained by willpower, an individual will turn into a hedonist. He may overeat, drink excessively, smoke excessively, play meaningless games to occupy the time, frequently attend parties, and use mood-enhancing drugs. If he has an education and has money, he may become a gourmand and only frequent good restaurants; he may become an aesthete and furnish his home with fine art; if he has talent, he may play a musical instrument, compose poetry, and live the life of a bohemian artist. But the common characteristic of most hedonists is their uncanny ability to avoid hard work.

Hyperphagia and hypophagia, are absent from Buss and Plonim’s list of temperaments; these are rarely thought of as affective and temperamental traits. However, these temperaments are important traits of emotional origin, and there is evidence for their strong heritability. We include the disposition for hyperphagia and hypophagia in our list of basic temperamental traits because it is a hedonic factor (gluttony) that drives some individuals to consume food in excess of their metabolic needs; it’s negative affect, anhedonia (finickiness) makes other individuals stop eating before they have satisfied their metabolic needs. The hedonism of eating more than what is needed to maintain normal body weight constitutes a health hazard prevalent in today’s population. There are several factors that lead to obesity (increase in body fat), including individual differences in energy metabolism and energy expenditure, but voracious appetite in the form of either constant snacking or binge eating is an important variable (Blackburn and Kanders, 1994; Bagchi and Preuss, 2012). Genetic studies indicate that there are greater correlations in the fat mass of identical twins than in fraternal twins, and in the fat mass of children and their biological parents, but no correlation with their adoptive parents (Stunkard
et al. 1986; Bouchard et al., 1993). It has been estimated that 50% of age- and gender-adjusted variance in obesity is due to inheritance, and current research indicates that several genes predispose obesity (Farooqi and O’Rahilly, 2007; Bouchard, 2010). In contrast, hypophagia is characterized by lack of appetite and outright distaste for all but the most palatable food items.

Gluttony and Obesity. Excessive consumption of food, particularly delectable items, is a common manifestation of indulgence and results in overweight or obese individuals. Obesity is excess body weight and fat deposits relative to height. A high proportion of obese people simply eat too much (Gormally et al., 1982); all obese people will become lean through voluntary efforts or if food consumption is drastically reduced by famine. A voracious appetite and the lack of hard work to burn the consumed calories are two important factors in excessive weight gain. The pejorative word for eating too much is gluttony; the pejorative word for laziness is sloth. A widely held psychosomatic theory is that obesity induced by hyperphagia occurs when unhappy, anxious, or distressed individuals consume lots of tasty foods for compensatory emotional gratification (Plutchik, 1976; Slochover et al., 1981). More recent studies suggest that negative mood states do not affect the size of meals regularly consumed but do lead to periodic binges (Telch and Agran, 1996). However, there are individual differences in energy metabolism that account for some obesity; people with low energy use often do not eat more than thin people (Kulesza, 1982). There is also evidence that pathological forms of hyperphagia (bulimia nervosa) and hypophagia (anorexia nervosa) are often due to endocrine, metabolic, and/or brain disorders (Blackburn and Kanders, 1994). Just like our other affective traits, there is both a genetic disposition and some environmental influence for becoming obese (Sorensen, 1995). According to an older survey (Gurney, 1936), only 10% of the children who had lean parents became obese; approximately 40% of the children became obese if one of the parents was obese, and 70% became obese if both parents were obese. Adoption studies have found a correlation between the fat mass of adoptees and their biological parents but no correlation with their adoptive parents (Stunkard et al., 1986). Similarity fat mass indices are higher in identical twins than in fraternal twins, with about 50% of the variance attributable to genetics (Bouchard, 2010).

In today’s society, obesity is looked upon as an unattractive trait, a physical handicap, and a serious health hazard. The self-esteem of fat people is often low and many of them try to lose weight by dieting, exercising, using appetite-suppressing drugs, or having surgical intervention to remove excess fat. Few of them succeed in the long run because of their strong urge to consume large meals every day and snack in between meals. Eating excessively becomes a lifestyle, and as people age and do less physical exercise to burn the calories, they become more obese each year.

Hedonism as Consumerism. Obesity is not widespread in economically underdeveloped societies, where people have limited access to high energy, palatable food items—sugars, fats and meat—and where they have to engage in heavy physical labor to make a living. But obesity has become an epidemic in economically developed societies where calorie-rich food items are available to all, even to the poor, and fast food restaurants prepare tasty meals that are eaten by masses of people who don’t dig, plow, or chop and carry firewood. Instead, people now use tractors to cultivate the land, sit in offices, and drive a car to the supermarket to buy
food. The rise of obesity in a large segment of the U.S. population started during World War II as more and more women entered the work force and were able to afford to buy processed food that, to make them tasty, contained lots of sugar, salt and fat. As affluence increased, fast food restaurants opened and, instead of cooking at home, families began to eat out on a regular basis and consume palatable meals far in excess of their caloric needs (Mozaffarian et al., 2011). It has been found that children who regularly eat out in fast food restaurants, consume more calories on a diet of pleasurable sweets, meat and fat, while children eating at home consume a healthy diet with milk, vegetables, and fruits (Bowman et al., 2004). The percentage of overweight children and adolescents has doubled since the early 1970s, with more than 20% of them considered overweight. Other factors than excessive food consumption has been contributing to the epidemic of obesity. Among them are the sedentariness of children, who spend hours a day watching television, and adults whose work involves sitting all day in offices or operating machines to do hard work rather than use picks and shovels (Jeffery and French, 1998). In summary, while the coordination of food intake is an extremely complex process involving gastrointestinal hormones, neurotransmitters, and excitatory and inhibitory brain mechanisms that control hunger and satiety, pleasure seeking is also an important factor in people with weak willpower, the cognitive mechanism for emotion control.

Recreational Use of Psychoactive Drugs. Another manifestation of the adoption of an affective lifestyle is the chronic use of psychoactive drugs. Psychoactive drugs are a great variety of chemical substances that alter the mental state of individuals; most are addictive and produce happy and euphoric feelings (Seymour and Smith, 1987). Some, like caffeine, act as a stimulant that keeps users awake after sleep deprivation. The inhalation of nicotine during smoking has a calming effect, reducing restlessness and enhancing the individual’s ability to concentrate on what he is doing. People use other drugs to produce euphoria, to reduce anxiety or depression, to dampen pain, to act as a hallucinogen, and to transport their consciousness into a dream world. Most drugs act as agonists or antagonists of neurotransmitters used by the limbic system to control emotions. Some drugs are relatively harmless when consumed in moderation, alcohol for example, because they do not induce physiological or psychological dependence. Others are devastating because from the start, they are strongly addictive; use of these drugs is often illicit, and it is a criminal offence to possess and consume them.

13.3.5. Irritability, Hostility and Violence. Child psychologists have distinguished between infants with “easy” and “difficult” temperaments (Thomas and Chess, 1977; Buss and Plomin, 1984). The infant with an easy temperament adapts quickly to the imposed feeding schedule, has regular sleeping and waking periods, does not fuss or cry excessively, and smiles happily when rewarded. The infant with a difficult temperament gets easily upset, whimpers and cries a lot, and often displays physiological and behavioral signs of distress in the absence of any external provocation. Longitudinal observations indicate that individual differences in irritability predict temperamental differences later in childhood, as irritable children develop into ill-tempered and maladjusted adolescents and adults (Caspi and Bem, 1990; Rothbart et al., 1994). In an early study, Birns et al. (1969) reported that distress levels in newborns predicted distress levels at 1, 3 and 4 months of age; a finding that was later extended to 2 years (Riese, 1987), and then 7 years of age (Rothbart et al. 1994). In a large scale, longitudinal investigation extending from 3 months of age into adulthood, Thomas and Chess (1977) found
enduring individual differences for such temperamental traits as intensity of reactions and positive or negative mood.

Some children display hostility and aggression at an early age by grabbing, hitting, biting and shoving their peers, or even adults who are much stronger than they are. The aggressive display may be prompted by the child not getting immediately what he wants or for no obvious reasons; it may be brief, little more than an outburst of anger that stops once the child gets what he wants, or prolonged, rising to a crescendo that parents find difficult to manage. How parents treat the aggressive child has enduring consequences. Children of punitive parents were found to become more aggressive than children of permissive parents (Sears et al., 1953; Eron et al., 1963; Eron, 1982) and absence of parental affection puts children at risk for developing aggressive tendencies (Feshbach, 1970). Aggressive behavior is particularly common among institutionalized children that receive little affection (Lowrey, 1940; Goldfarb, 1945; Langner et al., 1979). As they grow up, many children enjoy not only rough-and-tumble games, chasing and wrestling with one another, trying to prove that they are stronger, faster and more skilled than their peers but also enjoy bullying and torturing those they perceive weaker than themselves and some take delight in acts of vandalism (Manning et al., 1978).

The Heritability of Aggression. Lack of emotional control in children predicts aggression as they become adolescents (Caspi et al., 1995; Niv et al., 2011), and antisocial behavior in adolescents predicts rule breaking and criminality in adulthood (Loeber and Hay, 1997). Christiansen (1977) investigated criminality in over 3,500 twin males and found 35% concordance in identical twins and 13% concordance in fraternal twins. Adoption studies indicate a genetic-environmental interaction for the development of aggression and conduct disorder (Cadoret et al., 1995). Unfavorable home environment (alcoholism, depression and anxiety disorder of adoptive parents) in the presence of genetic risk produced a much higher number of aggressive adolescents and adults than would be predicted by either genetic or environmental factors acting independently.

The Aggressive Lifestyle: Conflict Resolution by Violence. The overt aggression of angry individuals is often prevented in civic societies that have laws forbidding individuals to resolve conflicts by violence. Nonetheless, there are many situations where people become so emotionally aroused that they do become violent (Meyer-Bahlberg, 1981; Mazur, 1983). The immediate causes that trigger aggression are deprivation, humiliation, frustration, and insult. Violence can be within families between spouses and siblings, feuds between families, hostilities between members of different social classes, different religious groups, different subcultures, civil wars within nations, and wars between nations. The source of violence is typically an emotionally triggered, self-centered assessment of a situation: jealousy, envy, rivalry, resentment, defense of personal or territorial space, revenge for past harm or insults, and the motivation to show one’s own superiority, or the superiority of one’s family, clan, tribe or nation over others.

Although the family fosters prosocial emotions—love, compassion and solidarity—statistical surveys indicate that more violence occurs within the family, particularly between husbands and wives, than any other group (Dobash and Dobash, 1979; Gelles, 1974). In
most cases husbands are the perpetrators of violence. Marital violence is more prevalent among people in a lower socioeconomic class than in the middle class (McClintock, 1978), presumably because economic hardship is frustrating, poor housing facilities and unwanted children are more common among the poor than the well-to-do. Battered wives may sustain bruises, lacerations, and such serious injuries as fractures of the nose, teeth, ribs, jaws and skull (Gayford, 1978). In many instances, the husband accuses his wife of flirting with other men. Within the family, children are often targets of physical abuse (Browne, 1989), and there is some evidence for transmission of aggression in the family from one generation to the next (Carroll, 1977).

A parent who was abused as a child is predisposed to abuse his children (Johnson and Morse, 1968; Silver et al., 1969). A parent who witnessed fights between his parents predisposes him to abuse his own children (Elmer 1967; Lukianowicz, 1971; Smith 1975). Aggressive differences between the sexes emerges early in childhood (Goodenough, 1931), is evident in later childhood (Barrett, 1979), and is a stable personality characteristic (Olweus, 1984); adult males are more overtly violent than adult females (Wolfgang and Ferracuti, 1967; Maccoby and Jacklin, 1974; Frodi et al., 1977; Brain, 1984). Revenge is an old form of human violence that can endure for generations as feuds between families and between clans that is maintained in the name of honor and obligation (Loizos, 1978; Otterbein, 1994). Such feuding is particularly prominent in societies (for example, the Mafia in Sicily) that have had a history of domination by outside powers and where self-help is the principal means of conflict resolution (Bloks, 1981).

**THE CALLOUS, THE SADIST AND THE BRAWLER.** Individuals who do not particularly enjoy hurting people commit the most widespread form of violence when they follow the orders of their superiors to do so. That obedience requires either an inherent callous disposition or an acquisition of callousness through training. Some policemen, jailers and soldiers, particularly mercenaries, display callous behavior. Callous behavior is widespread in dictatorships where that trait is condoned or even encouraged by the authorities. Callous individuals will mistreat prisoners of war under the least provocation or may torture them to get confessions for crimes or information about the enemy. Another form of callousness is shown by prosecutors and judges who, without actually using physical violence, mercilessly enforce the harsh sentencing requirements of their superiors without regard for the suffering they cause.

There have been some attempts to study callousness in the laboratory. In a well-known investigation (Milgram, 1975), college students were instructed to deliver electric shocks of increasing voltage to a stooge each time he made an error in a learning task in order to determine how that improved his learning. The instrument had settings that ostensibly increased voltage from 15 to 450 volts, and each time the setting was increased the stooge (the “learner”) simulated growing discomfort and pain. The results indicated that all the college students participating in the experiment were willing to deliver what they thought was 300 volts, about half of them up to the limit of 450 volts, although many of them became emotionally upset by doing so when they saw the stooge suffering and crying. Evidently, the willingness to become callous is a widespread behavior when that is demanded by authority, in this case, the instructor running the experiment.
In contrast to the callous individual, the sadist takes pleasure in hearing someone cry out in pain or see him bleeding or maimed. The self-centered, aggressive sadist may believe that he is somebody with power who can punish others at his will without such human weakness as pity or compassion. Fromm (1973) suggested that the person with a deep-seated doubt about his self-esteem is at risk to become a sadist; his ruthlessness gives him a sense of worth. Differing from the sadist who does not need an audience, the brawler seeks to enhance his self-esteem by provoking fights in a public setting, such as a bar. Without the least provocation, the pugnacious brawler begins to build his shaky image of his self-worth by starting an argument that turns into a fight to prove his courage and strength.

CROOKS, BANDITS, GANGSTERS AND TERRORISTS. There are individuals who disdain routine work and hard labor, and are ever ready to take advantage of the weak, the gullible, and the defenseless in order to make a living by cheating or terrorizing them. Crooks use cunning rather than violence, extracting pay for work that they do not intend to perform. They are not necessarily hostile individuals; they are merely insensitive to the harm they do to their victim in order to get something in exchange for nothing. Crooks tend to operate alone. Bandits and gangsters are different. They form small groups to intimidate people to get what they want and, if that does not work, will maim and kill them mercilessly (Thrasher, 1963). Bandits and gangsters do not respect the moral code of their society, but adhere to their group moral code that is rigidly enforced. They may be destitute or prosperous but they always are on a war footing for their economic survival, fighting not only the police but also with each other for domination of their “turf.”

Terrorism is a modern political phenomenon with a leadership, sympathizers, and a fighting wing that uses powerful weapons—such as machine guns, missiles and bombs—to intimidate and kill unarmed civilians; terrorism also challenges the military power of a nation they want to overthrow. Terrorists as individuals vary greatly in terms of personality traits (Borum, 2004; Moghaddam and Marsella, 2004). But they share the belief that detonating bombs and killing innocent people can solve social and political problems and religious issues. They are humiliated, frustrated, desperate, and angry people who typically belong to minority groups that are convinced that only violence and destruction will change their condition. People with a happy family life, steady and satisfactory employment, and the respect of their community are not likely to join terrorist organizations. It is individuals with grievances—those feeling rejected by their neighbors as outsiders—who gain a sense of belonging and become empowered by joining a terrorist group. Living in a society dominated by a different ethnic group, religious affiliation, economic status, or political ideology, terrorists cast reason aside and embrace the delusion that they can build a new society by destroying the existing one. Fanatic leaders, who are aided by a cadre of technicians and bureaucrats who take care of propaganda and recruitment, military training and planning, typically run terrorist groups. The group may also have a large following of sympathizers who provide the movement with financial and logistical help but are unwilling to fight. An odd assortment of young people recruited from all over the world is trained in secret camps and does most of the fighting. The enemy is demonized; the cause is glorified as self-sacrifice for God, Tribe, or the True Faith, and dying is elevated to martyrdom.
The Mitigation of Aggression: Participant and Spectator Sports. A new development in Western societies has been the mitigation of overt aggression by using spectator sports as a means of “letting off steam.” William James famously called sports “the moral equivalent of warfare.” The brain’s limbic system conjures strong emotions about the game, about players who are warriors and heroes. Children and adolescents are enrolled in competitive sports teams as part of their physical education, and colleges have sports programs that involve not only competitive display of skill and endurance—as in the case of running and swimming—but also the exercise of brute physical force—tackling, shoving, fighting and hurting one another in football. Baseball, basketball, and soccer are less dangerous, but there is danger of bodily harm in nearly all sports. It is not accidental that sports programs are a major part of a modern educational system even though the primary mission of schools is the dissemination of knowledge. Colleges and Universities use loyalty to their teams to petition alumni for monetary contributions. Few students who play in amateur school teams advance to professional teams. But most students have fond memories of sports during their school years. Consequently, the love of sports is nearly universal not only in developed countries but also in developing countries. Television provides many opportunities to participate vicariously in spectator sports—one of the most popular cultural establishments in the modern world. Millions of people identify themselves with one team or another, get emotionally aroused and yell as their team scores a point or loses or wins a game, getting a vicarious thrill of a hunter killing his prey, the warrior overpowering his enemy, or the gladiator fighting tigers or lions. Public entertainment by professional athletes has become a major industry as thousands of people attend competitive games in stadiums (Fig 13-14A) and millions regularly watch matches between teams on television. Team members are admired like celebrities; making a good or a bad play that causes a loss or a win is remembered for years. After the game, the team’s performance is usually a vigorously debated subject on TV sport commentary shows. The architectural landmarks at most colleges and many cities are sports arenas and stadiums (Fig. 13-14B). College sports give students opportunities to relieve restlessness brought on by their quiet life in lecture halls and the library. For many adults leading a humdrum daily existence in boring jobs, watching a game in a stadium or at home is a great way to forget about day-to-day problems. Moreover, it has been argued that international sports events, like the Olympics, reduce tension among nations by competing with each other not in bloody wars but in sport matches where they have to obey the rules of the game.

Does the violence of pop culture increase aggression? Aggression plays an important role in other forms of mass entertainment: movies, television, and video games. Actors maim, shoot, and kill each other for no reason. Adding to that display of violence, pop culture enhances emotional arousal by displaying erotic sexual scenes, slapstick humor, and tear-jerker dramas. The great appeal of pop culture is to raw emotions instead of to the higher sentiments of empathy and compassion in classical culture (Gans, 1974; Duncan et al., 1996; Swirski, 2005). Another form of mass entertainment is the live musical extravaganza. Emotional arousal is created by ear-shattering loud music with simple repetitive rhythms, often performed by musicians on psychoactive drugs, with masses of people singing and dancing along as lights flicker and people get hysteric. Modern pop culture appeals to the masses rather than to individuals who are more quiet and thoughtful. Access to pop culture is free through radio or television (paid
for by advertisers); hit songs can be inexpensively downloaded to ipods, cell phones, or other personal electronic devices.

The mass media attracts a large audience by depicting human conflict and violence on a scale that often exceeds the brutalism that we witness in the real world. Children as well as adults avidly watch such programs, and it is debated whether that induces them to become
more violent or, contrarily, has a cathartic effect and reduces violence. Some studies have found that watching a violent film, particularly one in which the violent actor is depicted as a hero, predisposes children, adolescents and adults to become more hostile, punitive and aggressive (McCarthy et al., 1975; Parke et al., 1977; Singer and Singer, 1981; Geen, 1983; Huesmann et al., 2003; Anderson et al., 2010). Others have found little evidence that viewing violent films has an enduring effect on aggressive and criminal behavior later in life (Milavsky et al., 1982). It may be the case that children who are prone to violence watch more violent films and video games, and the display of violence confirms their belief that violence is a way of resolving conflicts in daily life (Lefkowitz et al., 1977). Ferguson (2011) concluded on the basis of a review of the literature that children who are aggressive by disposition are likely to choose violent video games. However, there is no evidence that watching violence on television reduces violence, i.e., that it has cathartic effect. Watching television violence or playing brutal video games are similar to other affectively motivated indulgent activities—they provide the thrill of emotional gratification with little effort or danger to the individual.

Although we may feel pity for those who suffer, we often make people suffer by mocking or bullying them (Dworkin and Efran, 1967; Berkowitz, 1970). This mild form of hostility may be another manifestation of seeking to build our self-esteem. An example of that is when we laugh at the mishap of another person (Schadenfreude), such as when someone bumps into the wall or trips and falls. The victim is evidently sillier and clumsier than we are. This mild form of malice has made the portrayal of mishaps a popular form of comedy. Taking pleasure in someone’s failure or misfortune is a form of hostility and is usually so interpreted by the person who is being laughed at. Spite is a stronger form of interpersonal hostility in that we go out of our way to hurt our rival by finding ways to ridicule or punish him.

13.3.6. Extroversion, Introversion, Gregariousness, and Solitariness. The terms extroversion and introversion were coined by Jung (1923) who conceptualized the two as basic personality types, one with trusting, outgoing orientation towards others, the other mistrusting and withdrawal into one’s inner world. These two orientations have been adopted as basic personality types by investigators using factor analysis, such as Eysenck (1947). Some individuals derive pleasure from sensory stimulation, while others seek solitude. There is evidence for the considerable heritability of extroversion and introversion (Eysenck and Prell, 1956). An affective component of extroversion is trust; that of introversion mistrust. Related to extroversion is Zuckerman’s (1994) concept of “impulsive sensation seeking.”

The Development of Extroversion and Introversion. The first sign of the solidarity with peers is when one neonate’s crying induces the others to cry, an emotional reaction indistinguishable from distress crying (Sagi and Hoffman, 1976). By the age of about 3 months, an infant will increase its activity level at the sight of another infant (Field, 1979). Genuine social interaction is seen by 6 months when an infant will touch another and smile or laugh (Hay et al., 1983). A little later, a crawling infant will follow another (Vandell and Mueller, 1980). By the second year, children’s social interactions become more complex; such as, sharing toys and taking turns in playing together (Eckerman et al., 1975; Mueller and Lucas, 1975; Goldman and Ross, 1978; Rubin, 1980), displaying hostility by shoving each other or grabbing toys (Hay and Ross, 1982; Nash, 1988). However, there is little communication between young children other than
playing together with toys or sharing rules of the game, and little display of sadness when they are separated. It is not until about 8-9 years of age that children acquire a “best friend,” usually someone of the same gender, to play with, to talk to, to study with (Gesell and Ilg, 1949) and it is about 11-12 years of age when the preadolescents develop intimate relationships with a peer to discuss concerns about themselves and their relations with others (Gesell et al., 1956). It is during this period that emotional dependence on parents begins to weaken (Weiss, 1986).

Some infants and children display little interest in their peers. Developmental studies indicate that infants that display reticence in social situations are liable to become shy children (Hagekull, 1994). Kagan et al., (1990) found that the majority of extremely shy 2 to 3 year-olds developed into quiet, cautious and socially restrained 7 to 8 year-olds, and a similar proportion of outgoing toddlers became talkative and socially active youngsters. Caspi et al. (1988) followed a group of shy boys and found that their reticence was associated with delayed marriage and fatherhood. Shy girls did better by adopting conventional female roles, becoming mothers and homemakers.

Gregarious or Solitary Individuals choose different occupations and professions. Gregarious individuals may choose sales, social work, nursing, the military, politics, entertainment, etc. Solitary individuals may choose art, craftsmanship, writing, scholarship, research, accounting, etc. The gregarious individual will look forward to go to a bar, to a restaurant, or to a party after working hours; the solitary person will go home, eat alone, then settle down to watch television, read a book, listen to music, or work at various hobbies (Solano, 1986). But being lonely is a disagreeable emotional state for both gregarious and solitary individuals—we all seek some kind of social interaction. Problems will arise if social conditions lead to individual isolation. Many will suffer when their job transfers them to a new city, or even to a new country, where they will have to seek out new acquaintances and adapt to different routines. Many people feel abandoned in hospitals if a serious illness happens when they are away from family or friends (Gaev, 1976; Cutrona, 1982; Shaver et al., 1985). Being ignored or stigmatized by society is a particularly cruel form of socially imposed loneliness. A serious form of loneliness is brought about by the tragedy of having lost a loved one and the individual’s inability to establish new close relationships (Weiss, 1973). The aged tend to overcome the agony of loneliness by engaging in various activities, such as voluntary social work, reading, or watching television.

13.3.7. The Heritability of Temperamental Traits. It is well established that individual differences in temperamental traits have a strong genetic basis. Much of this evidence is based on factor-analytic studies of trait concordance between heterozygous (fraternal) and monozygous (identical) twins reared together in the same family or reared apart as adoptees of different families (Eysenck and Eysenck, 1985; Buss, 1988; Pedersen et al. 1988; Tellegen et al. 1988; Bergemann et al., 1993; Coccaro, et al., 1997; Chen et al., 2015). Loehlin and Nichols (1976), found a correlation of 0.53 on tests of assertiveness, dominance and hostility in a large sample of identical twins and a correlation of 0.25 in fraternal twins. Dworkin and Efran (1967) tested the same pairs of twins at 16 years of age and then again 10 years later. The difference in dominance between identical and fraternal twins apparently increased with age. Rushton et al. (1986) obtained an estimate of 39% genetic influence for aggression, and a
53% genetic influence of assertiveness. Based on a review of a large number of studies, Miles and Carey (1997) concluded that concordance for aggressive disposition is about 50% from genetics, with the rest attributed to environmental influences and experimental error. Rearing those with a genetic risk for aggression in an unfavorable environment (behavioral disorder or alcoholism of adopted parents) produces a much higher number of aggressive adolescents and adults than would be predicted by either genetic or environmental factors acting independently (Cadoret et al., 1995). It is widely believed that males are more aggressive than females. However, the evidence indicates that the apparent difference is due to styles of aggression (Lagerspetz et al., 1988; Björkqvist et al., 1992; Hess and Hagen, 2006). Males tend to use direct physical and verbal aggression; females use indirect aggression such as, gossiping, shunning, and maligning. Fearfulness also has a strong genetic component. For instance, Rose et al. (1981) found a correlation of 0.51 for identical twins but only 0.24 for fraternal twins in children’s fear of spiders and snakes, and Goldsmith and Campos (1986) reported a correlation of 0.46 for identical twins and 0.09 for fraternal twins for children’s fear of strangers.

There is also a strong genetic disposition to become an extrovert or an introvert. Identical twins are consistently more alike than fraternal twins on measures of extroversion and introversion, with a correlation of about 0.50 for identical twins and only 0.20 for same-sexed fraternal twins (Fig. 13-15, Eysenck and Prell, 1956). Shields (1962) reported that identical twins reared apart were more alike on measures of extroversion than those reared together. More recent studies estimated the contribution of genetics to extroversion and introversion in the neighborhood of 0.40 (Tellegen et al., 1988; Loehlin, 1992; Bergemann et al., 1993). In another large-scale study, nearly 15,000 twins of both sexes, ranging in age between 18 and 59,

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**THE INHERITANCE OF TEMPERAMENT IN IDENTICAL VS FRATERNAL TWINS**

![Diagram showing correlations for Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness to Experience in identical and fraternal twins.](image)

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**Fig. 13-15.** Data for several temperamental traits show that genetics has a strong influence in identical twins, but not fraternal twins.
were given tests for extroversion and neuroticism 6 years apart (Viken et al., 1994). Significant genetic effects were obtained at all ages in both males and females. Looking at these two traits from the affective perspective of gregariousness and solitariness, Scarr (1969) found that the concordance for social affiliation was 0.83 in identical twin girls and 0.56 for fraternal twins. The correlation for social affiliation in boys was 0.86 in identical twins and 0.35 in fraternal twins. Buss et al. (1973) reported that in twin boys, the correlation in measures for sociability was 0.63 in identical twins and 0.25 in fraternal twins. For twin girls the correlations were 0.53 in identical twins and 0.20 in fraternal twins. Matheny and Dolan (1980) obtained similar results. Tellegen et al. (1988), comparing identical twins reared together or apart estimated the genetic influence on “social closeness” to be about 0.40. The overall conclusion is that genetics strongly influences temperament but environmental influences can modify their expression.

13.3.8. The Affective-Compulsive Mindset. A personality dominated by one’s inborn temperament is what we call the affective/compulsive mindset. A variety of factors can modify this mindset. Some factors depend on social influences: rearing conditions, type of education, economic, social and political circumstances. Other factors depend on personal characteristics: weak or strong voluntary control over emotional expression, a tendency to empathize with or ignore the suffering of others. Differences in rearing conditions profoundly influence the early personality development of a child, and inborn affective disposition does not directly translate into predictable lifestyles. Permissive parents allow a child to get what he wants, while authoritarian parents insist that a child live by their dictates. An infant with a loving disposition may be raised by absent parents who cannot reciprocate his affection, or by callous parents who abuse him, or he may be raised in an institution because his parents have abandoned him. An adolescent may realize that his family is too poor to allow him to get what he needs, or that he lacks opportunities because he belongs to a racial or ethnic group, or that his politics or religion is discriminated against. Other affective inclinations may be similarly thwarted by prevailing social conditions. If he is inclined to be hedonistic and happens to be born into a wealthy family he may adopt an easygoing lifestyle, indulging in what he can get with little effort on his part, and grow up satisfied with his lot. But he may be born to a poor family and become very frustrated by his deprivation and may rebel against the social order he lives in. Because of the great complexity of the modern world, the lifestyle that individuals adopt may not be congruous with their inborn temperament. That creates considerable tension because the affective disposition that an individual is born with is probably never eradicated; it is just inhibited and ready to erupt when frustration gets too strong or circumstances change. The mismatch between the affective disposition of an individual and restrictions on that imposed by family, community and the larger social order are a major source of conflict between the individual and society in our rationally ordered and highly regimented modern world.

Individuals with an affective/impulsive mindset or personality—a vivid temperament—tend to be aggressive and hedonistic, adventurous and foolish, as well as generous and radiate good will. An affective/impulsive infant and toddler, may be difficult to handle, a rebellious child, and unable to control emotions. He may wonder why he should he get out of a warm bed early in the morning, rush to eat something quickly, and get to class on time? Sitting down and staying still to learn about a subject that is of no interest to him is unpleasant torture. He wonders: why not do something more exciting? He fidgets around, interrupts the class, and is
judged by his teachers to be hyperactive and suffering from attention deficit disorder. Instead of attending class, he may some days join another likeminded friend or a gang and go play football in the field, fish in the brook or shoot squirrels in the woods. He gets low grades and is socially less successful than his peers who have better control of their emotions. If he remains undisciplined, he may leave school and spend his life smoking, drinking, and experimenting with drugs as a pleasure-seeking adult. On the other hand, he may do well in assembling and fabricating things in middle and high schools that have vocational programs, and in those that have sports programs, he may excel as an athlete. By their disposition, affective individuals seek sensory stimulation and excitement; they have difficulty in delaying gratification; and they are ready to compete with others to prove their individual worth. In ages past, individuals with this temperamental disposition became mighty hunters, brave fighters, good athletes, fearless seafarers. If they lived at the right time in the right place, they might have become the admired heroes and charismatic leaders of their clan or tribe. In our modern regimented society, they may become usefully employed in jobs that require aggression, adventurousness, and a willingness to travel. In such settings, their peers perceive affective/impulsive individuals as jolly good fellows. However, they tend to live in the here-and-now and from hand-to-mouth. Why spend a portion of the money earned during the day on an old age pension and insurance, as modern life requires, when all the money can be spent immediately on having a good time with family and friends at home, or in a bar or restaurant? In general, the rebelliousness of affectively-biased individuals is liable to create discord. That becomes evident in the complex relations between parents and children, teachers and pupils, employers and employees, the rich and the poor, the uneducated and the educated, and those of different ethnic, religious, and cultural backgrounds.

13.4. Individual Differences in Character.

13.4.1. Understanding Character Traits. Character traits are usually distinguished as socially relevant (prosocial or antisocial) virtues or vices, such as honest or dishonest, fair or unfair, refined or boorish, trustworthy or untrustworthy. The character of an individual is evidently closely linked to his rearing conditions and ethical development, what we have called mnemnons. While inborn temperamental traits develop early in life, character traits develop slowly and depend very much on social training, education, and emulation.

Theophrastus (1902), Aristotle’s student and successor, presented brief sketches of people with such trait labels as the Superstitious Man, the Stupid Man, the Flatterer, the Braggart, the Garrulous Man, and so forth in The Characters. His use of the term “character,” a word that comes from the tool used to engrave inscriptions on a tablet, suggests that, like Aristotle, he considered character traits to be acquired and enduring habits rather than inborn dispositions. Aristotle, in contrast to Socrates and Plato, considered morality a product of reasoning, distinct from character traits. Aristotle wrote, referring to Socrates:

“… he thought all the virtues to be kinds of knowledge, so that to know justice and to be just come simultaneously …

(Aristotle, Ethica Eudemia, 1915a [Book I, 1216b])
But opposing that view, Aristotle stated:

Moral virtue … is the outcome of habit … It is neither by nature … nor in defiance of nature that virtues are implanted in us. Nature gives us the capacity of receiving them, and that capacity is perfected by habit.


Reason may have only a supportive role in ethical conduct. Concerned with the problem of how to create and maintain a moral society, Aristotle offered a long list of human virtues that ought to be promoted by education, such as justice, moderation, modesty, generosity, truthfulness, and graciousness. He distinguished between “liberally minded” people, those with a good moral education and character, and the poorly educated “masses” who may have to be socially coerced to behave virtuously:

… it is difficult for one to receive from his early days a right inclination to virtue, unless he is brought up under virtuous laws; for a life of temperance and steadfastness is not pleasant to most people, least of all to the young. It follows that the nurture and pursuits of the young should be regulated by law … for most people are moved by the fear of punishment rather than by the love of nobleness.


In general, Aristotle had a positive assessment of human nature and assumed that through proper rearing conditions and education most people’s character could be molded to make them virtuous.

In sharp contrast, undoubtedly brought about by the disintegration of the Greco-Roman civilization and the ensuing Dark Ages, the assessment of human nature by the Fathers of the Church changed drastically. According to Christian mythology, although God created man in his own image, due to Adam’s “original sin,” men are ever since born wicked and only through piety and devotion can they be saved by the grace of God. Moreover, as the hierarchic medieval order was established, it came to be generally assumed that such traits as honor and dignity were the heritage of the few with an aristocratic “blood line,” commoners were assumed to be born to become servile, boorish and immoral. However, by the beginning of the 17th century, as many industrious commoners became prosperous, the idea of the improvability of human conduct through character education became popular again. Books appeared like Joseph Hall’s *Characters of Vertves and Vice* (1608) and Jean de la Bruyère’s *Les Caractères de Théophraste* (1688). By the end of the century it was widely assumed that the moral character of people is a product of nurture rather than nature. Thus Locke wrote in 1693:

[People] are what they are, good or evil, useful or not, by their education. ‘Tis that which makes the great difference in mankind. The little or almost insensible impressions on our tender infancies have very important and lasting consequences …

(Locke, 1964, p. 25)

Adam Smith reiterated the same in 1776:

The difference of natural talents in different men is, in reality, much less than we are aware of … The difference between the most dissimilar characters, between a philosopher and a
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common street porter, for example, seems to arise not so much from nature, as from habit, custom, and education.

(Smith, 1976, pp. 19-20)

13.4.2. Experimental Studies of Character Traits. Early in the 20th century, psychologists interested in individual personality differences began to investigate character traits. In a pioneering study by Webb (1915), two raters assessed character differences of close to 200 students, and a factor analytic evaluation of the results indicated that “persistence” was a consistent individual character trait. (Others have more recently referred to that trait as conscientiousness, perseverance, or industriousness; Digman, 1990.) Terman (1925) compared the character traits of 500 gifted children (IQ over 130) with an equal number of children from the general population. Terman found that gifted children received higher test scores on such character traits as perseverance, prudence and truthfulness, but did not differ on such temperamental traits as tenderness and sympathy. However, casting doubt on the validity of the assumption that character traits are consistent features of an individual’s personality, Hartshorne and May (1928) reported that a subject’s “honesty” or “deceit” depended on circumstances. (A more recent statistical re-evaluation of Hartshorne and May’s data indicated that while some individuals were inconsistent in being honest, others were quite consistent; Burton, 1963.) In another study, Hartshorne et al. (1930) compared children’s conceptions of right and wrong with the ethical norms of their parents, friends, club leaders, day school teachers, and Sunday school teachers. The authors found a correlation of 0.55 between the moral values of children and their parents. Brogden (1940) carried out a factor analytic assessment of forty character items and recognized five character traits, what he called honesty, persistence, perseverance, self-control, and acceptance of the moral code. In a study of 3,000 children from intact and broken homes, Wallenstein (1937) found that some negative character traits could be directly attributed to being reared in disturbed homes. Perhaps because many presumed character traits could not be demonstrated as enduring personality variables, the idea that “character” was a stable determinant of human conduct was virtually banished from academic psychology by the mid-century (Allport, 1937). However, recent research has restored “honesty” to the category of an enduring differential character trait (Ashton and Lee, 2008; Hilbig et al., 2013; Kajonius and Dåderman, 2014).

13.4.3. The Basis of Character Development. Unlike inborn feelings and emotional expressions, an individual’s acquired character traits are not universal human attributes but are products of his upbringing, his family and his social and cultural background. That process is greatly dependent on an individual’s ability to internalize the lifestyle of his parents, teachers, and role models. Assimilation is largely based, from a psychological perspective, on mnemonic processes: memory and learning, imitation and copying, training and indoctrination. Individuals are born with a temperamental disposition to be extroverts or introverts, excitable or calm, gentle or hostile, but they are not born to be neat or sloppy, polite or rude, honest or dishonest, or worship this or that god. There is no merit to the belief that aristocrats inherit more refined character traits than peasants; their refinement came from their early experiences, rearing conditions, and many of their social, political and cultural privileges. In contrast to our inborn emotional disposition and temperament, our character traits, moral values and religious convictions are to a large extent (though not exclusively) products of mnemonic processes, the
assimilation of habits, beliefs and attitudes that have been imparted to us by our family, society, and culture.

**PARENTAL INFLUENCES.** Early childhood is the critical period for character development. A child’s character and morals are profoundly affected by the social, religious, ethnic, and national background of their parents (Cohen and Hodges, 1963; Porter 1971, Kohn, 1979; Gans, 1982). Parents, caretakers, teachers, and ministers feel compelled to pass on their convictions about what is right or wrong, true or false, praiseworthy or blameworthy, clean or dirty, beautiful or ugly, polite or impolite, important or trivial, sacred or profane. These character traits become imprinted into the docile children’s minds as mnemons—organizers of thoughts, foundations of judgments, and guides of habits. Mnemons control how children react to current events and how they think and reason. Many mnemonic character traits come from parental imitation and training, sibling and peer influences, and praise or punishment from teachers and other authority figures (Aronfreed, 1968; Scheibe, 1970; Damon, 1988). Children are impressionable because mnemonic mechanisms dispense with the need to think for oneself. The easiest way to learn how to live in a social setting without conflict is to do what others do, believe what others believe, and accept what is true or false as others do. A fair proportion of the children born in our modern civilization are raised in a family setting in which they receive considerable support from parents, siblings, and close relatives. As infants, they quickly adapt themselves to the schedules set up by their caretakers, coo and smile when fed or comforted, and behave much of the time as expected. When they are hungry, thirsty, ill, frightened or uncomfortable, their caretakers respond to their whimpering and crying by feeding and comforting them. When a child politely asks for food, he gets it with a smile; when he grabs food from others, he is punished. When the child is served food and eats it neatly he is praised; when he makes a mess of himself he is scolded. The child so treated learns to turn to his family for help and reassurance and tends to behave much like other members of his family and assimilate their value system. Most parents are fully conscious of their responsibility to teach their children good manners and habits, cooperate with other family members, and become valued members of society.

However, there is considerable variability in how parents raise their children and that has profound influence on character development (Rosenhahn et al., 1968; Elkin and Handel, 1989; Bandura, 1991; Killen and Smetana, 2006; Nucci et al., 2014). Some children are born to prosperous upper-class parents who live in mansions, send their children to prestigious schools, and make their children aware of their social status, privileges, and obligations. These parents expect that their children to maintain the family’s social status and fortune, and encourage their children to be proud and assertive. Children born to middle-class parents, who have steady jobs and live in well-maintained houses in respectable neighborhoods, tend to encourage their children to get a good education and professional training; these children have a greater chance of success in life choices and tend to develop accommodating character traits. Children born to poor parents, who are unemployed or work for low pay and live in substandard houses, are greatly handicapped. These children rarely get a good education, often drop out of school, and grow up with little social support. They are at risk to develop deviant character traits. Irrespective of economic status, some families are functional, with dependable parents who provide their children with what they need. Other families are dysfunctional,
with undependable, erratic, and absentee parents. Some families are adult-dominated, with the children expected to accommodate themselves to the lifestyle of the parents. Other families are child-centered, with the parents accommodating themselves to the needs of their children, trying their best to make their children happy. In some families both father and mother have the same expectations and use similar rearing practices; in other families the child has to cope with conflicting parental demands.

Baumrind (1973) distinguished between authoritarian, authoritative, and permissive parenting as styles of child rearing. The authoritarian parent is cold, rigid, and uncommunicative, and may have unrealistic expectations that the child may not be able to meet. The authoritative parent is warm, nurturing, and communicative, and has realistic expectations but is firm in enforcing his standards. The permissive parent exercises little control over the child’s conduct and remains warm even if the child fails to meet expectations. According to Baumrind, children of authoritarian and permissive parents tend to become selfish and uncooperative, whereas children of authoritative parents are better socialized. Hoffman and Saltzstein (1967) offered a similar parenting classification: power assertion (the method used by authoritarian parents), love withdrawal (communicating displeasure when the child misbehaves), and induction (using reasoning and persuasion). The authors found a negative correlation between power assertion type parents and various indices of their children’s moral development. Josefsson et al. (2013) showed that character traits are more heavily influenced by parental behavior and home environment than are temperamental traits in an 18-year longitudinal study. These measures included: 1 The mother’s welcoming or hostile attitude toward the child. 2 The socioeconomic status of the family. 3+4 The age of each parent at the birth of the child. 5+6 The presence or absence of parental unhealthy habits (drinking, smoking, obesity). 7+8 Whether a parent was satisfied or dissatisfied with his/her role as a parent. Finally, risk factors have strong cumulative effects. The results (Fig 13-15) show that the number of risk factors have little effect on temperamental traits (except when most of them are present), but the more risk factors present, the greater the effect on character traits.

The temperament of a child is also factor in character development. While imitation and emulation are major influences molding his character, the child is not a passive agent. He has inborn emotional impulses that make him rebel against the pressure to conform, and he has intelligence to doubt what he is told to believe if it does not make sense to him. As we noted earlier, there are early individual differences in temperamental traits, the calm, trusting and cooperative “easy” child, and the agitated, distrustful and uncooperative “difficult” child. It is upon this affective foundation that the child’s character develops as he interacts with his parents and elders, who themselves may differ temperamentally and thus make the relationship quite complex. That interrelationship becomes even more complex when a child goes to school and begins to interact with his peers and others who may treat him kindly or harshly, accept or reject him—thus facilitating or frustrating his character development. As a consequence, children develop “good” or “bad” character traits that are looked upon favorably or unfavorably by society (Table 13-5).

Character development is a dynamic process, a battle between the inclinations of the child and the demands of other family members. The accommodating child tries from the outset to
CUMULATIVE EFFECTS OF HOME ENVIRONMENTAL RISK FACTORS

A. Measures of Temperament

![Graph showing the effect of number of risk factors on temperamental traits.]

B. Measures of Character

![Graph showing the effect of number of risk factors on character traits.]

Fig. 13-16.
A. The number of risk factors in the home environment have little effect on temperamental traits.
B. In contrast, the more risk factors there are, the more negative are the effects on character as measured for self-directedness, cooperativeness, and for self-transcendence.
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Cooperate, such as sharing toys with siblings and doing what he/she is asked to do (Rheingold et al., 1976; Rogoff, 1991). The contrary child may refuse to cooperate. During the childhood rebellion stage (2 to 3 years), toddlers become mobile and acquire some self-sufficiency, they may say “no” whenever they are expected to say “yes,” and do the opposite of whatever they are asked to do. That period is a very difficult one and the conflict is resolved differently as a function of the child’s and parents’ temperamental traits. The “terrible twos” have enduring consequences on the ongoing relationship with parents and the child’s character development. In addition, a child’s character may be adversely affected by the loss of parental attention when a new sibling is born. Most children slowly learn what is proper or improper behavior: how to dress, how to keep their faces and hands clean, and how to comport themselves. They learn when to keep quiet, when to talk, how to address others according to their social status, and how to tell the difference between truth and the rich fantasy worlds created by their imaginations. The combination of imitation, rewards for compliance, and the power of social coercion (shaming, blaming, ridiculing, ostracizing) tend to ensure the adoption of social norms. Conformity is

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<td><strong>GROUP</strong></td>
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usually the path of least resistance. Once assimilated, these early norms of behavior become not only habits and routines unconsciously performed but also the framework that biases how the mature individual thinks and reasons.

**Educational Influences.** Next to the strong effects of family environment on character development, is the effect of education in a social setting. But that kind of education is relatively recent. Not so long ago, a young person growing up on a farm or in a small village with a subsistence economy had no opportunity to use his special talents to fully develop his potential. He had daily chores to perform from early childhood onward. A peasant had no opportunity to pursue his personal interests and develop his unique individuality. Consequently, education was limited to tutoring the children of the select few for centuries. The rich wanted their children to be distinguished from commoners by being literate, well-spoken, and refined. The church needed clerics who could manage their parishes; promising young men were selected to study the Bible and were taught how to preach and spread the Gospel. Then there were a few occupations that had to be filled by trained professionals; they studied the law and medicine.

Extending education to the masses in a group setting became a necessity during the Industrial Revolution. A large segment of the population translocated from villages to cities. Industries needed workers who knew how to read and write. These workers had to understand blueprints, assemble complex machines, operate them, and maintain them. Commerce required that buyers and sellers know arithmetic to count and calculate. Communication was also becoming a problem in the expanding cities because the old way of oral exchange between friends and neighbors had to be replaced by written public announcements, newspaper reports, and letters. Consequently, optional education was soon replaced by compulsory education. In small and homogeneous villages, education was often in the hands of religious teachers; in large and heterogeneous urban cities, education was in the hands of secular authorities. Since the introduction of government-supported public education, the mission of schools is to teach secular subjects and prepare students to be useful citizens in a complex technological society. Character education involving religious and some moral values is not an appropriate mission of public schools because students often come from different ethnic and religious backgrounds. That separation of religion and secularism is especially true in the USA, where freedom of religion is part of the Constitution, and it is illegal for the Government to foster one religion over another.

Schools play a major role in character education because they require discipline and good behavior from their students. Beginning with elementary school, the child has to wake up early in the morning, get properly dressed, meet the school bus, sit in one place for a prolonged period at his desk, do homework assignments on time, and accept the teachers’ assessment of his performance. The child also has to learn how to get along with his peers, form and break alliances, and assume the role of leader or follower as interactions and circumstances demand. Along the way, as he progresses from one grade to the next, he learns not only about the nature of the material world (mastering such subjects as the principles of physics, chemistry, and biology) but also how to become successful in social interactions with his classmates. Good students recognize the merits of being courteous and of not being boastful or dishonest. Because so much has to be learned to become successful in the modern world, and
because young people spend more and more of their formative years at school—graduating from elementary to middle to high school, many go to college and some even get a graduate education—academia plays a very important role in the character formation of the young adult.

Public education programs give students wide choices in coursework to develop his/her distinctive abilities. The best schools teach the basics of a subject and rigorously test students on memory and comprehension (Fig. 13-17A), giving all students a firm foundation in general knowledge. Most schools have sports programs that encourage competitiveness and fair play among team members (Fig. 13-17B); physically fit and agile youth might be motivated to pursue an athletic career. Students who enjoy learning new skills are given many opportunities for advancement: advanced computer programming classes for interested students, classes for those with musical talent, shop classes for those who like to work with their hands, home economics classes for those who like to cook and sew, etc. Some schools may even offer advanced training in metal working and welding or other skills that give students a chance to enter the work force immediately after graduation. The best academic programs encourage inventive and inquisitive students to solve problems using experimentation and creative thinking (Fig. 13-17C), like advanced placement science and math classes that allow students to bypass taking basic courses in the first year of college. The students who actively participate in their education and take advantage of the opportunities before them are rewarded with good grades, awards, and scholarships to continue their education and training. But there are always individuals who lack the internal motivation required to participate in the choices available at school, and they face a life in lower paying jobs during adulthood.

The prolonged education of today, and the need to identify those with particular skills has led to increasingly specialized career teaching programs. Widespread testing is used to identify and reward students with promise and to direct them towards appropriate career paths. Personal interests and aspirations may be ephemeral, but in many instances they become stable goals that a young person commits to and perseveres until he/she becomes a professional. It takes personal honesty to find your unique talents, and courage to develop those talents, even if that means facing social disapproval when your choice is contrary to the wishes of your parents or elders. Personal aspirations have been described as reflection-based, goal-directed endeavors which lead to a successful life career (Emmons, 1989). During the selection of a career choice, adolescents constantly assess themselves. Some become very critical of themselves (“I’m not good at that,” “I don’t work hard enough”), while others may feel that they do very well when, in fact, they make little progress. The secret to the successful pursuit of a career interest, which always takes a long time to realize, is the difficult rational process of delaying gratification. Young children given a choice of consuming a marshmallow right away or waiting 15 minutes until the experimenter returns to give them two marshmallows differ in their ability to control their impulses to gain a larger but delayed reward (Figure 13-18; Mischel et al., 1989). Follow up studies have indicated that the children who delay gratification tend to become more rational, less aggressive adults who are better able to control stress, and are less likely to become obese (Tobin and Graziano, 2009).

The people who successfully navigate through the rigors of education and training emerge with improved intellectual abilities and special talents for competent leadership. These people
are often recognized as gifted children; they not only cope with the daily challenges that all people face as they try to find a niche for themselves in our anonymous, mechanized and bureaucratic society, but they also assume leadership to solve novel problems. Our technological mechanized world requires leaders who know “how” complex systems function and “why” things are done this way rather than that way. When circumstances change as problems or opportunities arise, these leaders make the necessary adaptations. Their special talents may be expressed through keen observation of the physical world, innovative experimentation, mathematical or theoretical insights, and a deep understanding of human nature in society.
A healthy society should have a majority of citizens who were appropriately educated as children. These societies tend to choose rational reformers rather than agitators or demagogues as political leaders, select professionals rather than ideologues to solve technical problems, opt for long-term rather than short-term solutions, and admit failure when plans fail to produce results and adapt new plans. Such societies become leaders in economics, social stability, and political systems that inspire everyone to participate.

**13.4.4. The Mnemonic Mindset.** Mnemonic/compulsive individuals are inclined to fit into a social group rather than stand out, becoming accepted members of their family, clan, and community. They do well in school and are liable to move up the social and economic ladder as they become adults. Eschewing the unfamiliar, individuals with a mnemonic mindset prefer to follow a familiar path rather than setting out on an unknown trail. They rely on what they have been trained to do when making decisions rather than struggling to find a solution by themselves. Due to this attitude, the mnemonic person tends to be authority dependent, traditional, and conservative. The temperamental dispositions of fear, a sense of inadequacy, feelings of inferiority, and shyness can facilitate character traits that belong to the mnemonic/compulsive mindset. These individuals turn to their parents, knowledgeable elders, and more competent peers for reassurance and safety. The young can often relieve feelings of inadequacy and dependency by asking for help from their more capable and knowledgeable superiors rather than by struggling on their own. Of course, parents and teachers have, since time immemorial, sought to reinforce this dependent relationship and have used filial attachment to teach the young customs, etiquette, and the moral principles of their culture. Obedience is a declared obligation for children and often combines the prevailing moral principles with religious belief. From generation to generation, children are taught by their families to obey a watchful Almighty God.

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**Fig. 13-18.** The highly predictive delay of gratification experiment. A child is asked to not eat the marshmallow immediately, but wait 15 minutes and another marshmallow will be made available. Delay your desires now, for a greater reward later. Children who manage to wait will generally do better in school and become more rational adults.
In spite of getting a sophisticated scientific education, most mnemonic/compulsive adults retain their childhood belief in the supernatural, and turn to God for miracles to happen during great troubles. Returning to their childhood upbringing, they visualize that there is someone powerful out there who listens to their prayers. To reinforce that delusion, churches are built at great expense (Figs. 13-19, 13-20) and are maintained by a professional clergy. People wear amulets and fill their homes with symbols of their creed, such as crosses, altars, or statues of their prophets or saints. Faith in institutional religion remains a powerful force in the modern world even if the clergy have become less powerful. Since the decline of the monolithic power of the Catholic Church in the West, there has been a proliferation of religious dominations preaching different beliefs and dogmas, ranging from the more ethically and rationally oriented kind to the more emotional and demonstrative kind (Fig. 13-21).

But mnemonic/compulsive individuals can create personal and social problems. Religious faith is a powerful existential force and religious dogmas are more likely to be accepted without question. Mnemonic/compulsive individuals find it hard to adapt to cultural diversity in modern, pluralistic societies. In fundamentalist Christian societies, for example, members believe that the Holy Bible is based on divine revelation; the biblical narratives are true literal history, whether or not those stories can be reconciled with established scientific facts. Problems arise in particular when fundamentalists insist that the Ten Commandments are the inviolable foundation of moral behavior for all humans and those violating them are destined to burn in Hell. Commands not to kill and steal, or bear false witness, make very good moral sense, and that of honoring your father and mother is commendable. But why is worshipping Jesus Christ (part of The Holy Trinity), superior to worshipping Yahweh or Allah, revering
**Fig. 13-20.** The elaborate interior of a Catholic church (A), a simple Catholic church interior (B), and the starkly simple Quaker meeting room (C). (Images from Wikipedia.org)

**Fig. 13-21.** The emotional attendants of a Pentecostal church (A), quiet and restrained parishoners in a Catholic church (B), and the enormous congregation in a megachurch where over a thousand worshippers can gather (C). (Images from Wikipedia.org)
Buddha, or following the moral teachings of Confucius? And what is wrong with the religion of the Hindus in India and Shintos in Japan? Agnosticism is also rejected, even though it is the sensible admission that we know nothing about the ultimate metaphysical questions, such as the nature of divinity or the existence of the supernatural. Atheism is completely rejected by religious fundamentalists. Because people with a mnemonic mindset need social support to hold on to their views, they tend to react unfavorably toward those who question their creed and morality, perceiving the newcomers or new thinkers as troublemakers. And that disfavor often turns into hostility toward members of other religions who, like themselves, adhere just as tenaciously to their own creed. Sadly, compulsive fundamentalists in any religion are intolerant people who often go so far as to kill anyone who does not accept their faith.

Consider the following situation as an example of the importance of religion in an intelligent individual with a mnemonic/compulsive mindset: A pragmatically rational farmer who purchases the latest combine to harvest corn or wheat by himself on hundreds of acres—something that would have taken a team of laborers a half a century ago—is also a member of a Judeo-Christian congregation. He regularly goes to church to get God’s blessings on everything he does. The farmer prays for timely rain and thanks God for a good harvest, when that is dependent on weather conditions that his prayers cannot control. He takes his ill child to the hospital for expert medical care, but he also donates money to his church to assure that God will help the child recover. The farmer considers himself a born sinner required to pray to God for salvation and help in times of trouble. God may or may not opt to interfere with his fate by answering his prayers. When the child actually does recover, he thanks God—yet it is medical science and his child’s doctors that are responsible for the recovery. The farmer’s beliefs contradict the well-substantiated scientific evidence for determinism, the necessary relationship between antecedent causes and subsequent effects.

But in spite of their rigidity, mnemonic/compulsive individuals usually make positive contributions to society. They generally have average to above average intelligence. They follow instructions, work hard, and are less interested in “why” and more in “how.” Maintaining tradition and convention shape their personalities. They tend to be persevering and support the established social order. Although they do not excel in subjects that require deep philosophical thought, they tend to receive good grades in school and as adults are practical and efficient in their jobs. They are competent farmers, artisans, office clerks, and government officials, occupations that require the patient performance of repetitive routines day in and day out. Depending on what they were taught and assimilated, people with this mindset are good at controlling their emotions, respect law and order, and follow the dictates of their conscience. Because they are traditional and conventional (often semi-consciously), mnemonic/compulsive individuals constitute the backbone of established societies and become reliable guardians of their culture.

13.5. Individual Differences in Intelligence.

Human beings are alike when compared with other creatures because we can fabricate tools and weapons, form abstract ideas, use language to exchange those ideas with others, and pass on our accumulated skills and knowledge from one generation to the next. But
once we have acknowledged that commonality, we have to recognize our profound individual differences in terms of our intellectual abilities. There are various definitions of intelligence but no one definition is accepted by experts. Most definitions include: (i) flexibility to adapt to changing environmental conditions and circumstances; (ii) ability to learn and acquire good habits and effective skills; and (iii) the ability to think and reason, display insight, and come up with effective solutions to novel problems. These characteristics are blended together in each individual. Intelligence is not just reasoning power but a psychological construct of many powers. Reasoning power does differentiate individuals from one another for a variety of practical purposes—educational achievement, professional training, and selection for employment. Additional intellectual powers consist of the capacity to acquire, remember, and use a large fund of knowledge; the ability to control impulses, feelings and emotions, finally, the ability to think objectively and logically and make good judgments and decisions when choices are available. Those abilities often determine how far we get in our hierarchically ordered unequal society.

13.5.1. **The Testing of Intelligence.** What are the variables associated with greater or lesser intelligence? The early scientific approach to deal with this question has been to test many individuals and use the results to classify them into categories known as “types” rather than to truly analyze their own individuality. Standardized testing for intelligence is the most widespread use of this approach; statistical analysis of scores gives the individual a quantitative estimate that places him into a class below, at, or above average intelligence, many tests give an intelligence quotient (IQ).

Francis Galton (1869, 1883) was a pioneer in the scientific study of individual differences in mental abilities and popularized the modern concept of genius. Galton believed in human progress and argued that there are great individual differences in the physical strength, the energy, and the intellectual ability of individuals in a given population. Although he was not a professional psychologist, Galton collected information of simple “anthropometric” traits—height, arm span, strength of pull and squeeze, steadiness of hand, acuity of sight and color discrimination—from thousands of individuals, assuming that these variables were measures of individual differences in “nervous system power” and markers of the level of intelligence. Galton also studied individual differences in rote memory and mental imagery, and recommended the use of identical (monozygous) and fraternal (heterozygous) twins to disentangle the role of “nature” (genetics) and “nurture” (rearing conditions) in the traits of the individual. He called the most gifted individuals *geniuses* and thought they are the likely agents of social and cultural progress. Galton set up a laboratory to document and statistically evaluate these differences and found that geniuses were distinguished from the majority by being stronger, healthier, more agile, more self-assured, having a better memory and imagination, and more focused and purposeful. He believed that geniuses were genetically superior to the masses and advocated eugenics as a way to improve the human race. To process the vast amount of information that was accumulated, Galton used statistics to analyze the normal distribution of traits in the population, the “central tendency,” and the variation around this median, the “standard deviation.” He discovered the bell-shaped curve in the distribution of anthropometric traits. Collaborating with Karl Pearson, he introduced the idea of the regression line and the correlation coefficient ($r$) to measure the co-variation between
different test items. The correlation coefficient ranges from $r=1.0$ (perfect correlation) to $r=0.0$ (no correlation). In psychological tests, $r=.50$ between trait items in identical twins may be interpreted as 50% of that trait is inherited and the rest is due to other factors, including environmental influences. Correlated variables may be grouped together as sharing underlying mechanisms, while uncorrelated variables share few to no underlying mechanisms.

Galton’s studies of individual differences were not correlated with intelligence tests. Binet and Simon (1905, 1916) argued that in order to practically assess individual differences in intelligence, the tests should probe such higher mental functions as attention, imagination, and verbal comprehension. Using tests that contained more than 30 items designed for children, they obtained a composite score of intelligence which predicted their subsequent school performance. On the basis of an average child passing or failing test items of increased difficulty, Binet and Simon constructed tests appropriate for a child’s mental age (MA). For instance, if a child of chronological age (CA) 9 years performed well on tests designed for 8-year-olds but failed on those designed for 9-year-olds, he or she was considered to be of MA 8; i.e., less intelligent than the average. If the 9-year-old child passed the test designed for 10-year-olds, he or she was considered of MA 10; i.e., more intelligent than the average. William Stern, in his Über Psychologie der individuellen Differenzen (1900), proposed the use of an Intelligence Quotient, based on the formula, IQ=MA/CA x 100. Accordingly, an 8-year-old who passed the test designed for a 10-year-old has an IQ of 125 (10/8x100). Quantitative IQ tests (Binet and Simon, 1916; Terman 1917, 1925) established that the distribution of intelligence in a large population, much like many other biological traits, forms a symmetrical bell-shaped curve, with a small percentage of individuals at the high end and the tail end, and many average individuals in the middle (Fig. 13-22). Because IQ tests are reliable predictors of school performance, their major purpose is to place children appropriately in educational institutions. Popular adaptations of Binet and Simon’s IQ test was the one designed by Terman (1917), known as the Stanford-Binet test, which has been revised several times (Roid, 2003), and the Wechsler-Bellevue test, specifically designed for adults (Wechsler, 1939, 1958). These, and many other tests include subtests designed to probe different intellectual abilities, such as verbal comprehension, mathematical ability, abstract thinking, logical reasoning, imagination, and creativity (Minton and Schneider, 1980; Brody, 1992). The purpose of testing adolescents and adults is more concerned with predicting college and university performance, and their likely or unlikely success in different trades, businesses, and professions. Other tests have been designed to test individual differences in temperamental dispositions, character traits, and special aptitudes. Of special interest are the issues whether these differences are innate or acquired and whether they are enduring or changing over time.

**Factor Analysis of Individual Differences in Mental Abilities.** Galton and Pearson’s pioneering correlational approach to analyze individual differences in mental traits and aptitudes was later modified by using a statistical method, known as factor analysis, the aim of which is to take measurements from a large number of individuals and reduce those items by the degree of their co-variation ($r$) into a small number of “factors.” The data may come from the parents’ and teachers’ assessment of the mental traits of children; from adolescents’ and adults’ answers to questions or their ability to solve mental problems; from experimental tests of the performance of individuals challenged with different tasks, and other sources. In
research on individual differences in motor functions, for instance, the co-variation of a person’s performance on weight lifting, running speed, jumping, and throwing a ball can be combined into a scale of his “athletic ability.” The same individual’s performance on a series of tasks that require reading comprehension can be combined to assess his “verbal intelligence” and contrasted with his performance on a series of tasks that require numerical calculations as his “mathematical intelligence.” Factor analysis as the basis of scientific assessment of individual differences, of course, can be only as valid as the data on which it is based.

A theoretical interpretation of what these tests measured was offered by Spearman (1904, 1927). He suggested that individual performance on a series of tests was based on two factors, a shared general factor (g), and special aptitudes (s) specific to the particular test. Spearman (1927) defined general intelligence as “the education of relations and correlations,” the abstract conceptual ability to see a nexus between seemingly different phenomena, thus gaining insight.
into how they are interconnected. Today, \( g \) might be defined as superior higher-order neocortical processing power. In contrast to \( g \), \( s \) is a heterogeneous admixture of related and unrelated aptitudes, such as verbal fluency, superior memory, ease of manipulating numbers, athletic agility, musical talent, and a host of others. Superior talent in one particular domain may be a function of the modular organization of the projection and association areas of the neocortex. Thurstone (1935) modified Spearman’s two-factor theory by using a multifactorial analysis of intelligence. He administered a large battery of tests to a large number of students and used an elaborate statistical analysis. Test items with high correlations were put into separate clusters and seven primary factors of intelligence were identified (Table 13-6).

While not denying the existence of \( g \) as an important factor, Thurstone asserted that individual differences in intelligence are better described by a profile of factors rather than in a single IQ. Cattell (1946) and Guilford (1957) combined Spearman and Thurstone’s approaches. Cattell divided \( g \) into crystallized and fluid intelligence. Crystallized intelligence reflects education and cultural influences. It is the rigid mindset of the respectful child, the docile student who faithfully obeys instructions in doing his homework, and relies on rote learning. Those with crystallized intelligence are good at performing repetitive tasks and do that reliably. Fluid intelligence, in contrast, is characterized by flexibility, the ability to form novel ideas, to see problems from different angles, and reason analytically and critically; it is the basis of creativity. Guilford distinguished three dimensions in the structure of intelligence: what he called Operations, Content, and Products. “Operations,” or information processing, include memory, cognition and judgment. “Content” includes perceiving concrete patterns (shapes and sizes), using symbols (signs, codes) and semantics (meaning of words). “Products” include perceiving objects as units, classes, relationships, and interpretations. Speed and endurance is related to the category of Operations. There are slow thinkers and fast thinkers. Obviously the latter have an advantage over the former by being able to solve problems more rapidly, and more problems within a given time period. There are also thinkers who cannot concentrate and cogitate for long and those who can go on tirelessly. Only the latter can solve problems that require extended effort, being able to readily shift from one approach that does not work to another that does without abandoning the search. Under the category of Contents and Products we may distinguish those who like to engage in

<table>
<thead>
<tr>
<th>TYPE</th>
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<tbody>
<tr>
<td>SPATIAL</td>
<td>The ability to perceive spatial relations.</td>
</tr>
<tr>
<td>PERCEPTUAL</td>
<td>Rapid and accurate identification of visual detail.</td>
</tr>
<tr>
<td>NUMERICAL</td>
<td>Speed and accuracy of arithmetic computations.</td>
</tr>
<tr>
<td>VERBAL</td>
<td>Comprehension of the meaning of words.</td>
</tr>
<tr>
<td>MEMORY</td>
<td>Facility to memorize letters, numbers, words and other items.</td>
</tr>
<tr>
<td>INDUCTIVE REASONING</td>
<td>The ability to interpret observations.</td>
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<tr>
<td>DEDUCTIVE REASONING</td>
<td>The ability to form abstract concepts.</td>
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thinking as a mental game, such as some mathematicians, chess players, crossword puzzle solvers, tinkerers, inventors, and scientists. Flighty thinking and rigorous thinking is another distinction that underlies the different kinds of intelligences. Practical thinking during our waking hours is a principal constituent of our consciousness that directs us to perform specific tasks demanded by domestic necessities and occupational obligations. The practical pursuit of specific goals requires rigorous thinking or else we will not reach our goals or accomplish our tasks. However, we also think a lot about nonessential ideas or things either superficially or rigorously. Flighty thinking is undirected, hopping from one subject to another, and is liable to be invalid, drawing conclusions that satisfy our wishes but are based neither on solid evidence nor on good logic. Rigorous thinking, in contrast, is directed with attention concentrated on the issue at hand, and it is both based on evidence and valid logic. Based more on the observation of superior performers than on psychometrics, Gardner (1983) distinguished seven distinctive kinds of intelligences (Table 13-7). Each of these “intelligences” subsumes seven than one kind of talent. For instance, the linguistic intelligence of the orator, the poet and the radio announcer are quite different.

INTELLIGENCE TESTS AS PREDICTORS OF SUCCESS AND ACHIEVEMENT. Research clearly shows that IQ scores are extremely good predictors of academic performance (Minton and Schneider, 1980; Brody, 1992); very high IQ scores usually translate into very high academic grades. But high IQ and superior academic performance are only modest predictors of professional achievement in commerce, industry, science or medicine (Terman and Oden, 1947, 1959). Biographical studies established that successful leaders in these fields usually have well above average IQ scores (Roe, 1953; Goertzel et al., 1978) but most are not in the very high leading

<table>
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<tr>
<th>TYPE</th>
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<tbody>
<tr>
<td>LINGUISTIC</td>
<td>The special aptitude of public speakers and writers. This talent is revealed by fluency of speaking, having a large vocabulary, and a good comprehension of what others are saying or trying to communicate.</td>
</tr>
<tr>
<td>LOGICAL</td>
<td>The aptitude of mathematicians, scientists and philosophers. This is the ability to deal with numbers, mathematical symbols and equations, and do abstract thinking.</td>
</tr>
<tr>
<td>SPATIAL</td>
<td>The aptitude of surgeons, engineers, sculptors and painters. This requires talent for visualization and rotating shapes in the mind's eye.</td>
</tr>
<tr>
<td>MUSICAL</td>
<td>The distinctive ability of musicians, conductors and composers.</td>
</tr>
<tr>
<td>KINESTHETIC</td>
<td>The unique talent of dancers and athletes.</td>
</tr>
<tr>
<td>INTER-PERSONAL</td>
<td>The ability to understand other people: as displayed by successful salespeople, teachers and religious leaders.</td>
</tr>
<tr>
<td>PERSONAL</td>
<td>The ability to form a good understanding of oneself.</td>
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edge of the bell curve. The question is: how does IQ predict success in daily life, not only in relation to different occupations but also in the management of one’s personal affairs and social relations? In concordance with the bell curve of IQ distribution, those with average general intelligence do not perform well in occupations that require high reasoning power. The few with high inductive and deductive powers may succeed in professions that demand the ability to solve difficult and novel problems. Modern industrial society requires that those performing specialized tasks have corresponding special talents. Success in such different occupations as clerks, technicians, craftsmen, auto mechanics, computer repairmen, or athletes obviously requires different sorts of special intelligence, and the same applies to success in being a good architect, banker, lawyer, actor, or teacher. A clerk has to read, write and communicate well; a good architect has to have a good spatial sense to rotate shapes vicariously, and to manage a bank requires good mathematical ability and organizational skills. Few have the matching combination of high general intelligence and appropriate special intelligence for their jobs. Often these highly skilled professionals (teachers, for example) are not appropriately rewarded with prestige or income in society. Providing employment for those with limited general and special intelligence is another serious problem in modern industrial society where manufacturing is done with robots instead of individual workers on assembly lines.

13.5.2. The Stability and Heritability of Intelligence. A host of studies have dealt with the question: how stable are IQ scores across the life span (Jones and Bayley, 1941; Vernon, 1979; Brim and Kagan, 1980)? The Berkeley Growth Study is a longitudinal investigation that began with 61 “normal” children born between 1928 and 1929 that were retested from infancy to adulthood several times. The results indicated little relationship between IQ tests during early childhood and later tests, but some correlations existed between tests administered in later childhood, adolescence, and adulthood. Tests given to children at 2-3 years of age showed little predictive value for performance on the same tests 12 years later. (This contrasts with the high predictive value of infant temperamental traits on later measures.) IQ scores between 3-9 years of age predicted with an increasing probability the IQ of individuals at 18 years of age. Several hypotheses have been offered why intelligence tests in early childhood are less predictive of mature intelligence. One is that the brain is much more plastic in early childhood and environmental influences can more easily modify heredity. A second hypothesis is that intelligence tests used for preverbal children measures something other than verbal intelligence tested later in life. A third hypothesis is that intelligence is a genetically determined potential that depends on brain maturation and experiences to become manifest.

THE INTERACTION OF GENETIC AND ENVIRONMENTAL FACTORS in intelligence, as determined by IQ tests, has been extensively studied with different methods (Jensen, 1973; Vernon, 1979; Brody, 1992; Loehlin, 1992). A large number of studies indicate consistent IQ differences among individuals from different social, educational and ethnic backgrounds (Fig. 13-23). Those from privileged families and ethnic backgrounds consistently score higher than those from underprivileged backgrounds; the IQ of children of professional parents averaged about 115, that of children of unskilled laborers about 90.5. Moreover, individuals from different ethnic and racial groups coming from civilizations with a long literate history (Chinese, Asian-Indian, Jewish, European) tend to score higher on IQ tests than those that come from cultures that have been preliterate until recent times (African, Native American). African Americans in the U.S.
score, on the average, 15 points below European Americans. Taking all the available evidence together, it is clear that both genetics and environment interact. Which of the two—genetics or environment—is the greater contributor to IQ scores? Several studies have sought to answer this question but the answer is not straightforward. IQ concordance between biological parents and their children is between 0.48 and 0.50; the concordance between adopted parents and their children is quite low, between 0.37 and 0.07 with a mean of 0.21 (Fig. 13-24). These results support some genetic influence. Between fraternal twins reared together, concordance is about 0.64; between identical twins reared apart, concordance ranged between 0.69 and 0.86; between identical twins reared together, concordance is the highest at 0.91. The twin studies suggest a facilitating (rather than just additive) interaction between genetics and environment. There is little decline in the IQ score of adults until an advanced age, and much of that has been attributed to declining speed of information processing rather than reasoning ability (Lindenberger et al., 1993; Salthouse, 1996; Ritchie et al., 2014).
Correlation Between Parents and Children in Verbal Ability

Fig. 13-24. Verbal ability is slightly related to the verbal ability of their birth parents, indicating that some aspects of intelligence are related to heredity. (Adapted from Plomin & DeFries, 1998.)

Increase in IQ Scores (Flynn Effect)

Fig. 13-25. IQ scores have been increasing since the early 1950s. The greatest change is in the scores using Raven’s Progressive Matrices, a set of queries that is culturally neutral.
Chapter 13: Personalities and Societies

The modifiability of IQ test performance. The fact that environmental factors influence performance on IQ tests raises the possibility that the intelligence level of a population could be increased by appropriate remedial measures. The best measures are to improve nutrition and health care during pregnancy and infancy, early preschool education, creative classrooms from kindergarten through the 12th grade, greater accessibility to higher education, egalitarian political systems, better social relations, and governmental support to improve family situations. There is some evidence that young children of low income families raised in an experimentally-enriched environment before entering school had their IQ increased in young adulthood relative to those who left school early (Husén, 1951; Barnett and Hustedt, 2005). The best support for the role of education in increasing IQ scores comes from its steady rise in the past decades in the United States and other advanced countries (Fig. 13-25; Flynn, 1987, 2012), although some drop has been reported recently (Teasdale and Owen, 2008; Dutton and Lynn, 2013). That rise in IQ may be attributed to the fact that only a small proportion of the young received college education before World War II but their number has greatly increased since then. Emphasis on science and mathematics in the curriculum may have been contributing factors. No less important may have been improvements in nutrition, with considerable growth in height, skull circumference and brain size (Jantz, 2001). Interestingly, average IQ has been rising in lower scoring countries where health care and education have improved (Meisenberg and Woodley, 2013). That suggests a facilitating effect on IQ by access to health care, better nutrition, and more education. Taken all together, these findings suggest that society should make an extra effort to begin the education of all children at a very young age—compulsory and free nursery school. Educational settings should challenge the intellectually-gifted child. These data also point out the cruel injustice created by poverty and the extreme gap in economic levels. The poor are being robbed of their potential to fully develop their talents and become more effective contributing members of society.

13.5.3. The Rational/Critical Mindset. Just like the affective/militant and the mnemonic/compulsive mindsets, so also the rational/critical mindset has had positive and negative social, cultural and moral outcomes. On the one hand, people with a rational/critical mindset are characterized by an above average IQ, are analytic, are critical, and enjoy solving problems. In a school setting they are known as gifted children and receive good grades and awards. Some of these children display their superiority as a generalized trait while the talent of others is more special, such as the ability to work with numbers, speak fluently, perform physical tasks with great agility, play musical instruments, or have a creative imagination. As they grow up, they take pleasure in intellectual activities: gathering information, entertaining abstract ideas, and detecting inconsistencies in arguments. Gifted individuals may be sociable with leadership qualities, or independents that get involved in some self-chosen activity and pay little attention to what others say or do. They may become efficient executives of industry and commerce, shrewd bankers and financiers, effective and good communicators as journalists and writers, or innovative scientists and inventive engineers, musicians, and artists. Because our science-based technological society requires individuals with great intelligence, creative people with a rational/critical mindset advance our culture. Individuals with a rational/critical mindset paved the way for improving the human condition: inventing fire for cooking and warmth, fashioning stone tools to make spears, skin animals, and grind cereals, cultivating and domesticating plants and animals using selective breeding, inventing wheels, pulleys and
gears, and extracting metals from ores. In our scientific age, inventors have learned how to use fossil fuels and other hidden energy resources to generate steam and electricity to drive machines that mass-produce ever more complex tools and commodities of convenience and luxury.

On the other hand, many of the technological advances produced by people with a rational/critical mindset did not make life better but made it much worse. To begin with, many inventions were designed to make weapons of warfare more devastating rather than to improve living conditions. Hundreds of people have been maimed or killed in medieval wars by soldiers wielding their swords but millions died as armies began to use machine guns and launched bombing air raids. Nuclear bombs are the ultimate destructive weapons. As we discussed in Chapter 12, section 12.5., rationalism in war can produce massive loss of life and destroy entire societies and cultures. But more generally, rationalism in the economic sphere led to the exploitation of those without money by those who had capital to invest. Rationalism is the basis of shrewdness as well as knowledge; those who know how to invest money profitably become not only rich but also powerful socially, politically, and culturally.


13.6.1. The Individual and Society. The pursuit of happiness—objectively speaking the pursuit of self-realization—is a personal endeavor, but it cannot be realized without social support. In a rationally ordered democratic society, the individual can pursue a lifestyle of his own choosing, with the proviso that his choice does not interfere with the rights of others to choose their own lifestyles. The happiness of the largest number is good for society because that assures social harmony and solidarity. With individual differences in family, educational and social background, on the one hand, and individual mindsets, on the other hand, a “one-size-fits-all” approach cannot assure the happiness of the largest numbers. A recognized ideal of the modern state is to create and maintain a social order that gives everyone the same educational and occupational opportunities, the same health care, and equal protection of his rights by an impartial judicial system. As a mark of progress in that direction, several advanced Western nations have adopted a series of rational programs that fosters development of each citizen to realize his/her talents. Such nations have a democratic government that supports, among other social services the following: free health care for infants and preschoolers; free elementary and advanced public schools to educate children and adolescents; a reliable monetary policy and social security system that prevents people from becoming destitute. It also administers indiscriminately a fair system of laws and regulations that do not favor the rich over the poor and has an equitable taxation system that finances all these services as well as the maintenance of roads and bridges for safe travel and the reliable distribution of goods.

But sadly, most nations do not have a rational social order. The assurance of personal happiness, domestic tranquility, and international peace has yet to be accomplished as a rationally organized political order for a combination of reasons. Some nations are larger than others, have more economic resources, a better-educated work force, and a more efficient infrastructure. These nations can dictate the terms of their political and economic partnerships with other counties, typically poorer neighbors, because they are more prosperous and better
organized. With greater financial resources, the leaders of rich countries not only bribe the leaders of economically underdeveloped countries—a regular practice of colonialists and imperialists—but also use their armies to threaten or punish them. Consequently, poorer countries tend to be run by special interest groups seeking their own enrichment rather than the common good. Domestic political turmoil is common and leads to international conflicts. Most emerging countries have not yet developed a social order that can guarantee its citizens a good education, gainful employment, and careers of self-realization that enrich their societies. Ethnic hostilities and class conflicts are rampant and are often encouraged by investors from rich countries seeking to exploit the precious natural resources of poor countries. There is an enormous gap between the wealthy and the indigent in poor countries; economic security of working people fluctuates with the gyrations of an inadequately regulated market economy. Few developing nations spend a substantial part of their resources on the health and welfare of the majority; rather, most spend resources on the special interests of the powerful.

Putting developing countries aside, why is aggression, hatred, strife, lawlessness, and crime so prevalent in the prosperous Western world? How can affluence be combined with social conflict and individual unhappiness? We argue that serious consideration of neuropsychological factors and their power to organize human behavior must be better understood. Table 13-8 summarizes the individual characteristics of the three basic mindsets: affective/impulsive, mnemonic/compulsive, and rational/calculating that were discussed in Sections 13-3, 13-4 and 13-5. Although there is no individual that is a “pure” type, these three groups come close to describing most individuals in human society. Ignoring substantial individual differences in emotions, aggression, docility, and intelligence only creates frustration, discord, and conflicts between the individual and society. Although behavior is modifiable, the extent of that modifiability varies between individuals and is greatly dependent on the methods used to accomplish it. With its political instability, violent tenor of life, social injustices, and rampant hypocrisy, the medieval Age of Faith did not turn out to be a solution. The early phase of rationalism during the Enlightenment did not bring about social justice and international peace. More advanced rationalism in the 19th century was a thin intellectual veneer over the highly immoral substrate of exploiting the natural resources of less-developed societies. In the 20th century, the brutal physical force used by the Nazis to establish a Thousand Year Reich failed after 12 years of fighting that killed about 50 million people. Many people died as the Soviet Union, set up by the Bolsheviks and Communists, attempted to abolish class conflicts and private property that was based on idealistic and unrealistic views of human behavior. But that great failure in social engineering did not change human nature and the Soviet system collapsed after a few generations. A better understanding of the neuropsychology of human behavior in a social setting is extremely important for structuring societies that offer reduced tensions between the individual and society.

13.6.2. Varieties of Social Affiliation. Modifying Tönnies’ (1957) and Max Weber’s (1961) theory of two basic types of social affiliation, the communal and the associational, we have postulated that there are three types: (1) kinship-based in nuclear and extended families, (2) faith-based and ethnic-based communal associations, and (3) interest-based association. We argued in preceding chapters that these three types of social bonding emerged in a linear sequence during human cultural evolution: from the small nomadic Paleolithic hunting
groups that were family- and clan-based; to the larger sedentary Neolithic villages that were community-based; and culminating in the Archaic urban civilizations in which the interest-associational bonding first developed. In our modern age, these three modes of social bonding have not replaced one another but exist side by side, each of them serving a vital function within larger social entities that we call nations and civilizations.

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<th>Characteristics</th>
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<td>Rebellious</td>
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<td>Occupational preferences</td>
<td>Salesman</td>
<td>Bureaucrat</td>
<td>Manager</td>
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<td>Economic and habitat preferences</td>
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<td>Shame</td>
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Chapter 13: Personalities and Societies

The first phylogenetic and ontogenetic foundation of social bonding is kinship-based: the love that develops between parents and their young, the joy that children experience playing together, and the affection that forms between sexual partners, siblings, and close family members (Fig. 13-26A). The second source of social bonding is based on faith and ethnicity. Although trans-generational bonding led to the formation of clans in primitive societies, it is rare in modern societies. But there are many individuals who place great importance on their communities; for example, the village where they grew up, the religious congregation they belong to, or the ethnic neighborhood where they live. In these communities, dependence and cooperation between individuals is paramount. Their members grow up together in a tight religious community, children and adolescents acquire beliefs, moral values, and learn to cooperate as adults. These communities are composed of conventional people who do everything in the way they were taught, are certain of their convictions, are dedicated to their faith, and are guided by their moral obligations to their community. They cooperate rather than compete with one another, help each other in need, regularly attend church services, celebrate and feast together. They make donations to improve the community’s public or religious facilities. If one is psychologically able to conform, living in these communities can be very comforting and rewarding (Fig. 13-26 B).

The third source of social bonding are the rationally-based interactions among strangers who work together in pursuit of some common interest: Members of nomadic tribes made strenuous efforts to feed themselves and to provide shelter—activities closely connected to the satisfaction of their basic biological needs. Each morning, women may have set out to collect roots, berries, fruits, and nuts. Men may have planned hunting trips. But once their hunger was satisfied they might have moved under a tree to rest, gossip and enjoy the day. Members of sedentary peasant communities also toiled to feed themselves and their families so they could stay alive. Some peasant communities might have surplus products that were used to barter for salt, spices, or cooking vessels. An altogether different form of social bonding is the voluntary association of strangers who agree tacitly or explicitly to cooperate with one another to achieve some shared goal. Interest-based associational bonding is the prevalent ethos of our modern industrial and commercial society where individuals are influenced by the work they perform to earn a living by expending energy on tasks that are far removed from satisfying their basic biological needs. Employers and employees strive to manufacture superior products. Members of a professional association meet annually to exchange new ideas about their professions (Fig. 13-26C). Individuals join clubs to pursue a hobby; for example, photography clubs, computer clubs, cooking clubs, and so on.

Kinship-Based Dependency. The human newborn is totally helpless and requires around-the-clock care for months. The mother typically provides that help. Although some psychologists have argued that the mutual attachment between mother and young is a socially-facilitated learned behavior, it is now widely agreed that it is based on two built-in emotional dispositions: the emotional drive for caregiving by the mother and the inborn solicitation of care by the baby (Sears, 1972). The mother typically becomes attached to her baby soon after birth, while the baby, because of its perceptual immaturity, is likely to accept caregiving from anybody who will satisfy it (Wolff, 1969; Bower 1974b). Infant reciprocation begins at about 2-3 months with smiles, contended noises, and eye contact with its mother or caretaker.
THREE TYPES OF SOCIAL AFFILIATION

A. Kinship-based Gathering

B. Faith-based Gathering

C. Professional-based Gathering

Fig. 13-26. A. A family gathering in Eastern Asia (https://c2.staticflickr.com/8/7638/16985521449_f1b9fd8a21_b.jpg).
(Wolff, 1963). A few months later the infant happily smiles when playing (Stern, 1977). It is not until about 7-8 months of age that a child becomes specifically attached to its mother (or caretaker), shows distress when separated from her, and is afraid of strangers (Bowlby, 1969; Ainsworth, 1969; Ainsworth et al., 1978). That attachment and dependency is characterized by four features: (i) seeking contact or proximity to mother; (ii) watching her movements when separated; (iii) displaying anxiety with complete separation; and (iv) expressing joy and relief when reunited with mother. Around 2 years of age, children stay close to their mothers but tolerate being left with a friendly stranger (Blurton-Jones and Leach, 1972). They become more tolerant by 3 years of age (Maccoby and Feldman, 1972). By 4 years of age, children spontaneously venture farther and farther from their mothers for brief periods (Maccoby, 1980). Childhood rebellion follows the child’s learning to walk and talk and his ability to assume some degree of independence. The child’s attachment to mother assumes a new form. If a child separated from its mother becomes tired, upset or ill, it immediately runs to its mother for emotional support. In the case of prolonged separation, the child may become severely depressed (Yarrow, 1964; Heinicke and Westheimer, 1966).

Self-esteem and public approval are powerful manifestations of egocentric affects in most self-conscious human beings. As soon as the child can run around and interact with his peers, he tries to prove his worth by competing with them. He sets out to demonstrate that he is better than they are, stronger, faster, and more skilled at play. As a validation of that he also seeks his peers’ acceptance and admiration either by trying to impress them or flatter them. That urge to sustain one’s self-esteem and public approbation persists throughout the rest of life. We play competitive games to prove our athletic skill; we argue with people to show how knowledgeable or clever we are; we study hard to get better grades in school; we try to get the best jobs; we try to buy a home in the best neighborhood; we seek awards for our accomplishments. If we fail in that, instead of admitting our shortcomings, we may engage in self-image promotion by selecting our own arena of action, our own audience, or other ways to advertise or exhibit ourselves. This may take the form of extraordinary dressing, excessive exhibitionism, barroom brawling, and criminal behavior (Felson, 1982; Berkowitz, 1986).

**Adolescent Rebellion And Popular Culture.** The second jolt in character development occurs during adolescence (Steinberg, 2013). Emotional dependence on parents begins to decline in the juvenile period, becomes more pronounced during adolescence, and declines even more when an individual leaves home to go to college or join the work force (Adelson, 1980). Physiologically, adolescence is marked by profound biological transformations, beginning with puberty and ending in the cessation of somatic growth. Puberty changes physical appearance and hormonal status. Girls develop the distinctive secondary sex characteristics of mature women, boys those of mature men. Hormonal changes profoundly affect the mood state of adolescents, and they are challenged to develop a conception of their personal identity and how to structure their life as adults. Mentally, puberty is often a turbulent period as the young person tries to think for himself, becomes explicitly self-conscious, and begins to reflect upon his self-identity and his relations with others (Erikson, 1968; Marcia, 1980). The adolescent begins his quest for identity by reducing his dependence on his parents, often rejecting parental guidance altogether (Ausubel, 1950). He often does that before he has acquired a clear idea of who he wants to become and how to go about realizing his dreams. One day he is hopeful and
full of enthusiasm; the next day he may become anxious and depressed. Adolescents tend to brood a lot about their emotionally-tinged physiological changes and the challenges awaiting them. Girls seek support in a “best friend,” and boys may join a small group, such as a gang or a sports team (Ausubel, 1954; Thrasher, 1963; Waldrop and Halverson, 1975; Horrocks, 1976).

During the crisis of adolescence, many teens seek as much sensory stimulation as possible; their moods swing from manic exuberance to debilitating depression, from hope and confidence to fear and doubt. Global “popular culture” is easily accessible in our affluent modern world where the mass media disseminates attitudes and fads that permeate all aspects of modern life. “Classical culture” is different: its main purpose is inspiration and education and involves reading serious books, attending theater performances and listening to serious music. Classical culture used to be accessible only to the educated privileged classes but today it is available to everyone and is taught in many schools. However, most young people prefer popular culture which has a very strong influence on character development. Entertainers use bombastic settings during rock concerts to foster a mass feeling of abandon. These “celebrities” and “personalities” become role models for how to dress, talk, and what to become. Some adolescents spend hours watching romantic and melodramatic soap operas on television, others walk around with electronic loudspeakers in their ears listening endlessly to the most recent musical hits, still others may spend hours playing violent videogames. Many adolescents challenge parental authority and join gangs that engage in illegal or criminal activities. Still other adolescents, to prove their worth, may commit themselves to pursue difficult tasks, such as excel in sports, get involved in the challenging assembly of electronic devices, write computer programs, or become writers and scientists.

The Independence of Adolescents. As adolescents liberate themselves from parental bondage, they tend to experiment with different roles, behaviors, and ideologies. They may join a fraternity or a sorority, or enlist in the army, thus trying to become anonymous members of the crowd. Or, in an effort to assert their independence, they may cast away the norms imposed on them by their parents by smoking, drinking, using drugs, or engaging in dangerous activities, such as irresponsible sexual behavior. Many adolescents dream about accomplishing great things and may greatly overestimate their abilities and opportunities. Rebelling against conventional parental standards, adolescents often become members of a subculture, following the fads and fashions of their peers, accepting rules set up by a clique. Because of the mobility required in the modern world to get a higher education or a professional job, emotional ties with close friends are often weak in young adults. But new friendships tend to be with people who come from the same ethnic background, have the same religious affiliation, the same ideological orientation, and have similar personality traits (Huston and Levinger, 1978; Verbugge, 1983; Hays, 1988).

Self-sufficient individuals seeking intimacy are common during late adolescence and early adulthood. New relationships are established with peers and members of the opposite sex. Attachment and dependency are strong emotional forces that drive adolescents and young adults to seek intimacy with lovers. The relationship that lovers and married couples have may replace the bond with their parents (Steinberg, 2013). Some of the bond-promoting activities that lovers engage in, like kissing, holding hands, embracing, caressing each other, and using
words of endearment come straight from the repertoire of the parent-child relationship. The receptivity of human females during ovulation greatly supports that bonding. Because our age is characterized by mobility, new bonding is significant because previous social support systems and old friendships may be lost. Young men have powerful sexual emotions that urge them to establish and maintain bonds with young attractive women, and while women’s sexual impulses may be less intense, they may feel a need to become attached to attractive and dependable men. There is also a need for mutual sharing and self-disclosure. Most of us have an inner life that we are reluctant to share with just anybody for fear of ridicule or exploitation, but self-disclosure of that inner life plays a major role in the establishment of close relationships (Jourard, 1971). When self-disclosure is received by another with sympathy and is reciprocated, the barrier that usually separates two individuals breaks down and the couple acquire a sense of oneness or the “we” feeling (Derlega, 1984). Of course, anxiety about whether the love is reciprocated, the ambivalence of giving up one’s own autonomy, and other doubts can ruin a trusting relationship and bring about emotional upheaval in the life of the new couple (Hatfield, 1984). The affectionate bond between spouses may also weaken as the mother’s love is transferred to the children. But as spouses pool their chores, economic resources, and share their feelings and thoughts, they may develop an enduring trusting relationship that persists beyond the age when sexual and parental bonding have weakened. Close relationships are often severed by circumstances beyond the control of one or both partners. One person may become involved with a third person, or may become severely ill and die. Severance of intimate relationships tends to have serious emotional consequences, referred to as separation anxiety (Parkes, 1973). That emotional upheaval may consist of grief and despair, interspersed with bouts of anger and depression. A widow may grieve and cry for months when thinking of her dead husband. And even after the grief subsides, the memory of the loved one may be cherished for a long time and lead to various commemorative acts or rituals.

Leaders, Followers, And Cultural Change. As most of us leave home and school to take a full-time job, we begin to come to terms with reality. Once we get married and need to support a family, the practical tasks of learning a trade or mastering a profession and earning enough money to pay the bills are about all that we can cope with. Dreams of great achievements are forgotten, and most people become ordinary members of society, followers of those who are leaders. Some followers are passive individuals who, by genetics or by training, are not aggressive, are more peaceful, are tolerant, and reject warfare to resolve social and political conflicts. But most followers respond to deprivation and frustration with aggression rather than with negotiation or retreat. They readily become collaborators, party members, or soldiers. Militant nations depend on recruiting individuals who are naturally disposed to be aggressive and who delight in the thrill of fighting wars as did their animal-hunting ancestors. In the modern world, these followers get the legal right and moral approbation to use weapons and mercilessly kill the enemy in the battlefield (Fig. 13-27, bottom).

Leaders are those few individuals who have the drive, energy, aggression, and talent to prove themselves stronger, brighter and more capable than the great masses; they are driven by what has been called “achievement motivation” (Fig. 13-27, top; Murray, 1938; McClelland et al., 1953). Achievement motivation is self-centered and enhances one’s self-esteem; it manifests in two forms: seeking “social power” or “autonomy,” described as extrinsic or
intrinsic control (Lefcourt, 1966; Veroff and Veroff, 1972). Social power aims at *mastery over others*; autonomy aims at *mastery over oneself*. That emotionally driven trait is manifest in such behaviors as a determination to overcome obstacles and master difficult tasks, excel in whatever one is doing, and prove one’s worth and superiority to others. Testimonials to one’s social power are prestige and honor that have taken different forms in different cultures. In our industrial/commercial society, the principal sources of prestige and honor are fame and wealth. *Fame* can be achieved in many ways: being elected or appointed to a high public office, becoming a star in the entertainment world, becoming a sports champion, or making a major scientific or engineering discovery. The famous person’s activities are written about in newspapers and magazines, and are the subject of radio and television programs. Seeing one’s name and picture in the public media contributes greatly to the individual’s self-esteem. *Wealth* is gauged in how much money a person earns a year, how much money he accumulates, what kind of a neighborhood and house he lives in, the size of his yacht, and the contributions he makes to political and social causes that advertise his philanthropy. The affective basis of seeking fame and wealth is a cognitively modified form of aggression that is manifest in most primates and most human cultures as fighting for dominance in their hierarchically-organized societies.
Cultural change cannot occur without the emotional drive of strong social leaders and the emotional fervor of their followers. Aggressive, militant, and brutal cultures are led by soldiers, orators, and politicians who exploit the pent-up anger and frustration of more passive individuals in their group to follow them in an outburst of mass frenzy. They know what their followers dream about, and promise them that they will help them achieve that. If they succeed, they gain credibility, respect, or even adulation. Without exception, militant leaders have inflated egos and delusions of their infallibility; they start a movement, a revolution, go to war, or use other means to destroy the existing social order. Many effective militant leaders are rebel-rousing demagogues who blame the ills of their society on foreigners and enemies. They demonize minorities who speak a different language, follow a different religion, or look different than the majority. They denigrate neighboring peoples whom they describe as barbarians bent upon destroying “our” culture. Lingering xenophobia is used to mobilize the majority population to join a rebellion, create a civil war, or embark on an unprovoked foreign war that often produces social and cultural change. Within a country’s borders, minority populations having unique tribal, linguistic, and racial backgrounds often live in specific neighborhoods where they have limited social interaction with the majority population. These groups have different traditions and have difficulty communicating with the majority population; often conflicts cannot be resolved peacefully. Those having political power—whether members of the majority or of an elite minority—harass and persecute those with less political power. All that leads to greater social unrest. It is this kind of leadership that changes the ethos of a society.

13.7 Religion and Society.

13.7.1. Religion is Based on Imagination. Belief in religious doctrines and practices is not in our DNA. Nobody is born genetically disposed to accept a religious tradition. Religious belief is not based on perceptual experience or empirical evidence. Rather, it is based on acceptance and internalization of hearsay, legends, wishful thinking, and dreams by reifying them with imagination. If we did not have a considerable ability to imagine the unreal, our world would be objective with only the here and the now. Imagination allows us to visualize supernatural beings with supernatural powers. In polytheistic religions, these “beings” were often ancestors that were honored with shrines in the homes of their descendants. In monotheistic religions, there is one all-knowing and all-powerful God. Since we were toddlers, we are taught to fear and worship God. In the Christian tradition, we imagine angels, the devil, and give them specific features and attributes. We also imagine Heaven and Hell as real places. In the absence of perceptual evidence, our imaginations can “see” with our “mind’s eye” the God that we have been taught to believe in. These imaginary supernatural beings have been objectified in sculptures, paintings, rituals, religious objects, and shrines that are displayed in homes and in houses of worship (Fig. 13-28). Children, who already love to play “make believe,” are extremely receptive to religious education from their parents and teachers. Make-believe play allows children to overcome their physical limitations and assume adult roles; they transform mundane things into other objects—such as, a stick becomes a horse, a plate becomes a car steering wheel, a blanket becomes the robe of a queen. Children engage in make-believe plays as early as two years of age, and that activity greatly increases in duration and complexity in the following years (Singer and Singer, 1990). Lonely children have the vicarious ability to believe in invisible beings and invent imaginary companions (Ames and Learned, 1946;
Taylor, 1999; Gleason et al., 2000). These children engage in lengthy conversations and play
with a nonexistent brother, sister or playmate, a behavior that may be supported by eidetic
imagery. Children are also receptive believers in an imaginary world of fairytalees and legends,
magic, and the supernatural powers of heroes. Santa Clause brings presents at Christmas
that will make you happy. Dangerous creatures (trolls, ghosts, dragons) move about in dark
underground spaces. Because of this imagined fear, children readily accept the suggestion that
praying to God is a sure way to gain help when they are frightened or in trouble.

13.7.2. Religion Gives Comfort and Support. One of the most characteristic features of a
human society is the presence of rituals that constitute a religion. The multitude of religions
would not have arisen without the fantasies, delusions, hallucinations, and nightmares of
shamans, prophets, theologians, missionaries, and preachers who founded and propagated
religions in each society. Thus, just like language, each human society built its own religion
that provided emotional support for the group. The moral principles of most religions were
formulated a long time ago, seeking to help people cope with life in a prescientific world.
Life was difficult and precarious; there was little understanding of the nature of the physical
world, and the ability to exploit its resources was limited. Work was backbreaking and often
produced limited rewards. Infant and childhood mortality was high. People had to endure
famines, suffered from many incurable ailments and contagious diseases, and they aged fast
and died early. In their social relations, injustice was the rule of the day and the maltreated and
oppressed had nowhere to turn to obtain redress for their grievances. Faith in their religion
offered people solace and the hope for just retribution in the next world. Clerics took full
advantage of that situation and made fantastic claims for happiness in heaven after suffering
on earth.

All this changed in the modern world as life has become easier and survival more
predictable. People now use machines to perform heavy work, and mechanical and electrical
devices perform mundane chores. Most people have access to a great variety of nutrients
throughout the year, obtain preventive medical care to avoid disease, get remedial treatment
when they do get sick, and their life expectancy is much longer. This new way of life requires
a new orientation: a rational one based on secular education that teaches the individual how
to judge events in science-based realistic terms. But science is not an easy subject to master
and does not offer a solution to all human predicaments and tragedies. While less frequent,
suffering, disease, tragedies, and death of a loved one remain part of life. The objective
answers that science provides are cold facts, not the reassuring and comforting beliefs that
religious faith offers. Consequently, billions of people are believers to this day despite any
scientific evidence to support the validity of religious myths and legends. The rational need
for an explanation of the meaning of life with its suffering, frustrations and tragedies, and
the emotional need for help in hard times are additional factors that assure the persistence
of religious belief throughout life. Adults, much like children, need emotional support during
economic depressions and natural catastrophes when their survival is threatened. The death
of a loved one causes major emotional disturbances. During these times, even well-educated
people will turn to the comfort of religious belief to soothe their personal fears and sorrows.
In exchange for worshipping the omniscient and omnipotent God, the believer can depend on
God’s help. As David Hume wrote in his Natural History of Religion, faith helps people with:
the anxious concern for happiness, the dread of future misery, the terror of death, the thirst for revenge, the appetite for food and other necessaries. Agitated by hopes and fears of this nature … men scrutinize, with a trembling curiosity, the source of future causes, and examine the various and contrary events of human life. And in this disordered scene, with eyes still more disordered and astonished, they see the first obscure traces of divinity.

(Hume, 1757, 1976, p. 32.)

A high proportion of the modern population lives in two worlds: a technology- and science-based rational one when dealing with practical issues, and a fear- and hope-based irrational one when facing life’s vicissitudes. This duality creates cognitive dissonance. In response, some believers have eased up on adhering to all the dictates and dogmas of their religion but have retained core elements of their faith. As noted before, belief in a divine order provides religious people with hope and courage to face the uncertain future; their church affiliation gives social support and a peaceful haven in a hectic mechanized world. Consequently, many reject scientific rationalism that depicts the earth and the universe as an accumulation of random events that has no purpose. Instead, most people retain their religious affiliations and are averse to the constant social, political, and moral changes created by new discoveries in science and technology. Churches are enduring institutions that provide them with rock-solid answers rather than tentative hypotheses. Regular church attendance, where familiar rituals and ceremonies are performed, provides a sense of security that we live in a stable world. Holiday festivities offer a welcome change from mundane existence to colorful and inspiring events. Religious communities also offer companionship to the lonely, encouragement to the despairing and suffering, and charity to those in need. These positive contributions make religious people more satisfied with their lives and less prone to depression than people without a religion (Table 13-9; Hackney and Sanders, 2003; Smith et al., 2003; Okulicz-Kozaryn, 2010). And unlike scientists with their provisional theories and hypotheses, clerics provide their parishioners with simple, categorical answers to such existential questions as the meaning and significance of life. Finally, many parents retain their religious affiliation not for themselves but for their children, because they believe that religious indoctrination is a better source of character education than is secular influence.

TABLE 13-9
RELIGION HAS A POSITIVE EFFECT ON EMOTIONAL HEALTH

<table>
<thead>
<tr>
<th>% of Sample</th>
<th>Very religious</th>
<th>Moderately religious</th>
<th>Non-religious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry</td>
<td>30.6%</td>
<td>38.6%</td>
<td>34.0%</td>
</tr>
<tr>
<td>Stress</td>
<td>39.1%</td>
<td>46.0%</td>
<td>43.1%</td>
</tr>
<tr>
<td>Sadness</td>
<td>16.5%</td>
<td>20.9%</td>
<td>17.4%</td>
</tr>
<tr>
<td>Anger</td>
<td>12.5%</td>
<td>16.3%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Diagnosed with depression</td>
<td>15.6%</td>
<td>20.4%</td>
<td>18.7%</td>
</tr>
</tbody>
</table>

Religious faith can have a good influence on character development. On the one hand, it promotes personal peace of mind and generosity towards those of the same creed. In a small homogeneous social setting, religious indoctrination often has positive consequences by reinforcing in-group solidarity. Regular attendance of church services and participating in collective rituals fosters a sense of togetherness and promotes goodwill towards neighbors. There are a few deeply religious individuals who are engaged in a metaphysical quest for the meaning of existence—theologians whose profession is to promote religion. Individuals who seek to understand the nature of the universe, man’s place in nature, and the purpose of life are engaged in an intellectual enterprise that is not different from the effort of philosophers engaged in the same quest (King, 1968; Batson et al., 1993). And the professional clerics who serve as leaders of religious communities have theological training and a vested interest to use rational arguments to defend and promote their religion. But for the great masses of people, religion is little more than a traditional script how to think and behave. And importantly the teachings of the religion in which the individual is raised offer readymade answers to his cognitive perplexities. As William James wrote about the average individual:

His religion has been made for him by others, communicated to him by tradition, determined to fixed forms by imitation, and retained by habit.

(James, 1902, 1929, p. 6)

The people who regularly attend church services and abide by the rules and regulations of their creed are not on an intellectual journey but want clear prescriptions as to what is right and wrong, how to raise their children so that they will be upright and respected citizens, and get straightforward answers about the meaning of life. It is these conventional rule-following and tradition-respecting people with a mnemonic mindset who attend church services regularly, pay their tithes, send their children to parochial schools, and sustain their religion as an enduring cultural institution.

13.7.3. The Negative Aspects of Religious Fervor (Religiosity). Family influences are very important in the development of religiosity, as indicated by the high correlation (about 0.60) between measures of the parents’ religiousness and their young adult offspring (Hunsberger, 1976). However, genetic factors also play a role (Bouchard et al., 1999). In identical and fraternal twin studies, it has been reported that the heritability of religious fervor increases between adolescence and adulthood from 12 percent to 44 percent in identical twins. Family influence on religiosity decreases from 56 per cent to 18 percent during adolescence (Koenig et al., 2005). This may be related to crises during adolescence, when some shed their religion and others become more religious (Tamminen, 1991; Argyle, 2000). The influence of genetics in these twin studies is most probably related to the inheritance of an emotional disposition that favors a mnemonic mindset.

Religiosity is associated with other measures of the mnemonic mindset. It is positively correlated (range 0.50-0.60; Bouchard, 2004; Bouchard and McGue, 2003) with conservatism and authoritarianism as character traits. Character traits such as constraint and control—measures related to conservatism—are correlated (0.50 range) between identical twins reared apart; but there is minimal correlation between fraternal twins reared apart (Tellegen et al.,
The inheritability of conscientiousness and agreeableness—measures related to intrinsic religiosity—ranges between 0.44 and 0.53 (Bouchard and McGue, 2003). And per a recent twin study, there is a genetic component in individual differences among adults in patriotism and prejudice towards outsiders (Lewis et al., 2013). Religious fundamentalism and intolerant right-wing politics tend to be correlated social attitudes (Fowler et al., 2004; Jost et al. 2009; Hirsh et al., 2013). There is ample evidence that people with strong church affiliations tend to be less intelligent than those who are less religious or are secular, and high IQ is a predictor of religious doubt and atheism (Ecklund and Parker, 2009; Lynn et al., 2009; Nyborg, 2009; Kanazawa, 2010; Lewis et al. 2011; Zuckerman et al., 2013). Finally, there are other factors, such as education and economic status. In countries with a per capita GDP below $2,000, 95% of the people consider themselves religious, whereas in the richest countries with a per capita GDP above $25,000, only 47% of the people consider themselves religious (Crabtree, 2010).

In summary, religiosity has a paradoxical effect on character and moral development. Although most religions proclaim the virtue of love, evidence indicates that the more religious a person is the more likely that he will be prejudiced against those who are members of another religion, and he will be prejudiced against those who look or behave differently than he does. Religiosity, as measured by frequency of church attendance and prayer, is positively correlated with sectarian, ethnic and racial prejudice and intolerance (Donahue, 1985; Altemayer and Hunsberger, 1992; Batson et al., 1993; Powell and Clarke, 2013). It has also been reported that less religious people tend to be more generous towards strangers, such as lending their possessions or offering their seat on a bus or train, than more religious people (Saslow et al., 2012).

13.7.4. Religion is a Divisive Force in Society. Primitive peoples are known to have existed in a past with simple religion based mainly on ancestor worship or the worship of natural phenomena (the sun, the sea, the wind). The emergence of institutional religion with elaborate rituals and taboos is not a human universal like thinking, speaking, or using tools. To begin with, the dominant religion of a society is often unrelated to the racial or ethnic identity of its population, but is traceable to such historic antecedents as cultural diffusion, missionary activity, dynastic changes, and invasions. Still, most people tend to remain affiliated with the religion in which they were raised until the end of their life. Telling a believer that the divine origin of his religion is not supported by objective evidence is liable to strike him as blasphemous. Believers in another religion are dismissed as infidels. Fundamentalist sects are even intolerant of others in their own religion who do not follow the same rituals. Religious fundamentalism is a major contributor to divisiveness in human society. Most important, state-sponsored fundamentalist religions take away the right to freedom of religion for minority groups.

The most destructive violence within nations is the conflict between different ethnic groups and between different religious groups. Religious conflict is paradoxical because most religions preach love of neighbor and peace in the world. Nonetheless, religious discord looms large as sources of conflict and violence between segments of a population within cities, regions of a country and between nations (Fig. 13-29). That is so for several reasons. First, many people who are not inclined to violence feel justified to be violent if they engage in it.
Fig 13-29 Top. A color-coded map of the world showing countries with low (light colors) to high (dark colors) religious conflicts.

Fig 13-29 Bottom. Data from the Pew Research Center indicating that the involvement of Governments in restrictions on religion from June 2007 to December 2012 has risen most dramatically in the Middle East and North Africa, somewhat dramatically in the Asia Pacific and Europe, and least in Sub-Saharan Africa and the Americas.
for the glory of God and the defense of their faith. Second, true believers can demonize their victims as infidels deserving persecution. Third, frustrated people are often encouraged by their militant leaders to find scapegoats to vent their anger. State-supported violence is most common in dictatorships where laws are arbitrarily enacted to discriminate against minorities; enforcement of these laws use strong-armed tactics carried out by vigilantes or a secret police. Societies that encourage these conflicts may be successful in the short run, but they are doomed to failure in the long run. On a broader scale, religion is an irrational force in society and has been the excuse, and in many instances the cause, for discrimination against and the persecution of those outside the fold, of pogroms, of civil wars, of terrorism, and of international wars. In the final analysis, religious differences divide rather than unite people in a society.

The divisiveness of religion has its roots in “education.” Churches in today’s modern secular societies no longer have the political power to coerce people to attend worship services regularly, but they still have considerable influence when parents allow them to take charge of their child’s character and moral development. Using brainwashing techniques, church schools make children memorize dogmas and core beliefs that cannot be questioned and must be accepted as the absolute truth that comes directly from God. Interference with freedom begins with the symbolic act of infant baptism, or another ritual, and continues with a systematic system of indoctrination that often promotes prejudice, intolerance, and limits personal intellectual freedom. To use Roman Catholic schools as an example, it makes good sense to encourage the young to be responsible in their sexual relations, but it is unjustified to assert dogmatically that sexual relations are only for procreation. Evolutionary biology has established that sexual relations also have the important social role of bonding two individuals. Therefore, it is unjustified to oppose birth control when overpopulation has become a threat to the planet’s ecological balance, or declare ex cathedra that a fertilized ovum or blastocyst is a “person” and has similar rights as the woman who is pregnant. Consider these facts: infants are born with immense mental potential that will not be realized unless they are raised in a liberal framework providing each one intellectual freedom. Adult guidance should foster rather than stunt intellectual freedom with educational programs that teach tolerance. For example, students from different ethnic groups within a class could tell their classmates about their customs on religious holidays. Knowledge reduces fear and shows that “foreigners” are not so bad after all. Just as biased education supports hostility, divisiveness, and conflict, so also will tolerant education support the acceptance and celebration of our diversity. The children exposed to biased religious indoctrination are not being prepared for citizenship in large multiethnic and pluralistic human societies. The seeds of destruction are sown because children obligated to adhere to the irrational beliefs and dogmas of religion A make no sense to other children who are obligated to accept the irrational beliefs and dogmas of religion B.

Notwithstanding the claim that religion contributes to moral development, there is demographic evidence that church attendance in advanced societies is correlated with higher rates of sexually transmitted diseases, teen-age pregnancy and abortion, and many health problems (Paul, 2005). The most secular democratic countries in the West, such as Denmark and Sweden, have the lowest rates of corruption, violent crime and homicide in the world (Zuckerman, 2008). Today, there is an ongoing decline in the proportion of people who claim religious affiliation, and a growing number of agnostics and atheists. Many of these are people
with a critical intellect and a good scientific education who respond to the challenge of facing reality by living without the belief in the efficacy of prayers, or the existence of supernatural beings, or the possibility of miracles; instead, they take care of themselves and behave rationally when times are difficult.


13.8.1. Origins of Morality. Generally, morality is a compromise between meeting the demand for harmonious social relations and the need for individuals to feel fairly treated in their societies. There are two contrasting theories of the origins of morality. The older view is that morality is a guide for living dictated by the commands of natural and divine laws. Our psychobiological theory is congruent with the more recent view that psychological and sociological factors play major roles in the development of morality. Our thesis is that the moral code that people live by originate socially and culturally and is passed on from generation to generation by learning, training, and emulation. As children grow up, they assimilate the principles that parents, role models, teachers and religious leaders consider to be right or wrong, decent or indecent, commendable or reprehensible, virtuous or sinful. The social and cultural origin of morality is based on change over time, a sharp contrast to the older view that morality comes from immutable natural or divine law that is based on concordance between the cosmic order of things or the inviolable dictates of God.

The fact that ethical norms are not universal across cultures supports the theory of the social origin of morality. Right and wrong, economic conditions, social relations, and political systems have changed over time. For example, sharing the meat of an animal killed by a brave with all members of a clan was a moral obligation in nomadic societies. Since nomads could not preserve and store meat, it made good sense to share the kill and expect reciprocation some other day. In contrast, respect for personal property is a moral imperative today. Revenge killing also made sense as a moral obligation when there were no governments to protect the group. Today revenge killing is a crime. As societies became more complex, a moral code based on tradition was replaced by a justice system based on legislation.

The Naive Natural Law Theory. The naïve natural law theory comes from anthropological studies of primitive societies. These societies have traditional norms of conduct, and their members are duty-bound to obey these moral standards (e.g., Murdock, 1934; Boas, 1938; Herskovits, 1948). In all societies, some acts are considered abominable or sinful, such as incestuous sexual intercourse or the unprovoked killing of a member of one’s clan or tribe. Other acts are treated as blameworthy or wrong, such as adultery, stealing from members of one’s community or failing to perform timely rituals or ceremonies. Still other acts are considered praiseworthy or right, such as cooperation with kin, respect for elders, helping those in need, and hospitality towards visitors. In primitive societies, the existing moral codes are inviolable rules because transgressions are violations of the natural order of things. There are dire consequences not only for the law breaker but also for the entire social group. For instance, just as consuming poisonous mushrooms have serious consequences for the consumer, so also was eating the totemic ancestor animal that was believed to be the clan’s protector.
The Modern Natural Law Theory. A modified duty-based (deontological) view of moral behavior is the modern natural law theory (Wollheim, 1967; Foriers and Perelman, 1973; Rachels, 1993). This theory is based on the idea that what transpires in nature has a purpose, and it is man’s obligation to promote rather than hinder that purpose. For instance, the biological purpose of sexual behavior is the propagation of the species, hence sexual behavior that leads to reproduction is morally right but sexual behavior as a pleasure-seeking self-indulging activity is morally wrong. Marital sex is right because it promises the offspring care of two parents, but extramarital sex is wrong because a single mother raising her children without a father may jeopardize their welfare.

How can the individual know what is the natural law so that he can lead a moral life? There are two answers to this question. One is that nature has endowed human beings with moral affects; the other is that man is born with moral intelligence. Francis Hutcheson (1738) proposed the moral affect theory, and Immanuel Kant (1781, 1785) elaborated the moral intelligence theory. Hutcheson argued that it is part of our inborn nature that we feel good when we do what is morally right, and feel bad when we do something that is morally wrong. Hutcheson’s idea of inborn moral affects predates the modern psychobiological evidence of the evolutionary origins of the prosocial emotions, such as kindness towards kin. However, Kant rejected the idea that actions based on emotions—compassion and sympathy—qualifies as moral behavior. As he wrote:

There are many minds so sympathetically constituted that, without any other motive of vanity or self-interest, they find a pleasure in spreading joy around them … But I maintain that in such a case an action of this kind … has nevertheless no true moral worth … [It] deserves praise and encouragement, but not esteem. For the maxim lacks the moral import, namely, that such actions be done from duty, not from inclination.

(Kant, 1970, p 181. Italics in original)

Recognizing the fickleness of emotions and individual differences in emotional disposition, Kant wanted a more solid and universal foundation for morality. For him, moral intelligence was part of the rational order of the cosmos, as both “the starry heavens above and the moral law within” are governed by inviolable natural laws. Man, by applying his superior intelligence to the cause of cosmic and social harmony, is duty-bound to act morally.

A Critique of Natural Law Theories. The anthropological and historical evidence does not support the cosmic origin and immutability of morality. The physical “laws” of the universe (the world “as is”) and the moral “laws” of humanity (how individuals “ought” to behave) are not identical. Morality is not inherent in human nature; rather, it is a changing guideline on how to live as a member of society with as little conflict and as much harmony as possible. For example, the concept of personal property was less operative in hunter-gatherer societies than it was in sedentary agricultural societies.

Natural law moral theories posit the extra-human origin of morality. Moral conduct is not a compromise between what an individual needs and what society can permit but an inviolable personal duty. The assumption was that once everybody acted in congruence with the moral laws, all humanity will be living in a just world.
I do not … need any far reaching penetration to discern what I have to do in order that my will may be morally good. Inexperienced in the course of the world, incapable of being prepared for all its contingencies, I only ask myself: Canst thou also will that thy maxim should be a universal law? If not, then it must be rejected … because it cannot enter as a principle into a possible universal legislation.

(Kant, 1970, p. 188)

This is an intellectual demand, as Kant himself implies, that few of us ever engage in when we make moral decisions and act accordingly in our daily routines. The reality is that we do not act in congruence with our inborn "moral intelligence" because it does not exist.

*The Divine Command Theory.* In the religious civilizations of the ancient world the attribution of the prevailing moral code was shifted to the commands of the gods, or almighty God. For instance in the Judeo-Christian tradition, God created humanity with the mission to worship Him and uphold the cosmic order; it is the religious obligation of every individual raised in that tradition, to serve the divine will. Virtuous behavior is synonymous with what “God has commanded” and immoral behavior synonymous with what “God has forbidden.” But how is one to know what is God’s will? That is simple: consult the Holy Scriptures or turn for guidance to God’s representatives on earth, rabbis and priests. The problem that critical philosophers have with this theory is that while some of the commands seem to be eminently ethical in nature, others are devoid of any ethical merit. “Thou shalt not kill,” is obviously a meaningful ethical command, but what is ethical merit of obeying the instruction, “No graven images or likeness”? Once religious taboos or obligations become aspects the moral code—for instance the Jewish prohibition of consuming pork or the Catholic prohibition of taking birth control pills for contraception—these blameless acts become as sinful as the instruction against “bearing false witness.”

Nonetheless, there is a widespread conviction to this day that religious faith is the foundation of morality. Parents strive to make their children become upright members of their community by using religious indoctrination: the love and fear of God, the obligation to pray and perform daily rituals, and the imperative to attend church services regularly. Until quite recently, the schools that children and adolescents attended were church-affiliated, which combined the teaching of reading, writing and arithmetic with Bible readings, moral sermons to resist temptation and sin, and the inculcation of a faith-based morality. There is in fact a close psychological and sociological nexus between religion and morality. The psychological connection is that both religion and morality have a strong mnemonic foundation, i.e., the guidance of thought and behavior on memory-based traditions and conventions through indoctrination, preaching, and education. The sociological connection is that a major function of both religion and ethics is to turn self-centered and undisciplined individuals into cooperative members of the community.

*Morality as The Acquisition of Virtuous Traits.* From a psychological perspective, virtues are character traits of individuals that society approves of and finds praiseworthy, and vices are character traits that society disapproves of and finds reprehensible. Newborns and infants are not moral agents and are not expected to behave morally. But parents, teachers, and other authority figures seek to inculcate the maturing child with patterns of behavior, beliefs, and
attitudes that they themselves were taught to consider “right,” and discourage attitudes and patterns of behavior that they were taught to consider “wrong.” Some of these character traits and moral values are universal in all societies, because they are prerequisites of social cohesion and solidarity, while others are specific to particular societies. Obedience, truthfulness and industriousness are considered positive character traits in all societies; disobedience, dishonesty and sloth are considered negative character traits in all societies. But there are character traits that are approved of in some societies and disapproved of in others, and vice versa. In some societies, obligations to family or tribe are the primary moral imperatives of the individual, while moral obligations to outsiders are secondary or do not apply at all. Some societies consider pride, competitiveness and independence as commendable positive character traits, while others value humility, cooperation, and submission to the community. In some societies religious faith and piety is valued highly, while in others critical thinking or professional accomplishments are considered praiseworthy. While emotions and reasoning contribute to individual moral development, the dominant contributors are early experience, social facilitation, training, role modeling, and indoctrination.

Virtue theory considers that morality has a social origin and contrasts with the theory that morality has a divine or natural origin. Individual traits are considered virtuous and praiseworthy if they promote social harmony and maintain social, economic, and political order. Traits, attitudes and actions that create social conflicts and disorder are considered blameworthy vices. Nurturing parents are praised because they take good care of their children, and obedient children are praised because they behave well. Neglectful parents are blamed and so are their rebellious children. As children grow up, they are praised for ethical behavior—generous, honest, and fair—because that promotes harmonious social interrelations. Children are criticized for unethical behavior—stingy, dishonest, and unfair—because these traits lead to social discord. Ethical behavior is not obedience to what God commands, as proclaimed by prophets and asserted by clerics. Ethical behavior is not designed to support the cosmic order, as Kant has claimed. Rather, ethical behavioral patterns have been implanted into the minds of infants from birth by the common consent of society. Through imitation, education, and indoctrination, society praises the children who assimilate their values and discourages the children who are troublemakers.

13.8.2. The Development of Morality (Table 13-10). Piaget (1932) was a pioneer in the study of moral development in children. His approach was a cognitive one: how children of different ages reason about what is right and wrong, and how they judge various acts in terms of their concept of morality. Piaget distinguished three stages in moral development. The first stage, called heteronomous morality, is the slavish acceptance of the rules of behavior prescribed by such authority figures as parents and teachers. The young child knows what acts he is praised for or reprimanded for, and calls the former “good,” the latter “bad.” The judgments are memory-based responses without any comprehension of the rational principles involved. Older children reach the second stage, called morality of cooperation, as they interact and play with one another, and come to judge through negotiation what is fair or unfair, right or wrong. Adults reach the third stage, autonomous morality. Moral decisions change from what one has been indoctrinated to consider good or evil, to what one judges to be socially beneficial or harmful.
Peck and Havighurst (1960) related the development of morality to character development. They defined character as

a persisting pattern of attitudes and motives which produce a rather predictable kind and quality of moral behavior.

(Peck and Havighurst, 1960, p. 164)

Based on factor analysis, Peck and Havighurst described five stages of moral development and they argued that some individuals never advance much beyond the first stage and only a few reach the last stage. Their stages of moral development, described as “personality types” are as follows.

The *amoral* person does as his whims dictate with no consideration of how his actions affect others. If he has a positive emotional disposition, others perceive him as charming but irresponsible. If he has a negative emotional disposition, he is considered aggressive and may become a delinquent or a criminal. The amoral person is one whose character development has become arrested during infancy, when socialization begins to counteract uninhibited emotionalism.

The *expedient* person is fully familiar with the morals of his society but he has not internalized them; he has no guilt feelings or conscience. He abstains from lying and cheating only when he fears detection. In the absence of external controls (as when the social order

<table>
<thead>
<tr>
<th>SCIENTISTS</th>
<th>AGE</th>
<th>MORAL STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIAGET</td>
<td>EARLY CHILDHOOD</td>
<td>HETERONOMOUS MORALITY</td>
</tr>
<tr>
<td></td>
<td>MIDDLE CHILDHOOD</td>
<td>MORALITY OF COOPERATION</td>
</tr>
<tr>
<td></td>
<td>MATURE ADULTHOOD</td>
<td>AUTONOMOUS MORALITY</td>
</tr>
<tr>
<td>PECK AND HAVINGHURST</td>
<td>INFANCY</td>
<td>AMORAL</td>
</tr>
<tr>
<td></td>
<td>EARLY CHILDHOOD</td>
<td>EXPEDIENT</td>
</tr>
<tr>
<td></td>
<td>LATE CHILDHOOD</td>
<td>CONFORMING</td>
</tr>
<tr>
<td></td>
<td>ADOLESCENCE</td>
<td>IRRATIONAL CONSCIENTIOUS</td>
</tr>
<tr>
<td></td>
<td>MATURE ADULTHOOD</td>
<td>RATIONAL ALTRUISTIC</td>
</tr>
<tr>
<td>KOHLBERG</td>
<td>PRECONVENTIONAL</td>
<td>EGOCENTRIC (AFFECTIVE)</td>
</tr>
<tr>
<td></td>
<td>CONVENTIONAL</td>
<td>SOCIAL COOPERATION (MNEMONIC)</td>
</tr>
<tr>
<td></td>
<td>POSTCONVENTIONAL</td>
<td>CRITICAL CONSENSUAL (RATIONAL)</td>
</tr>
</tbody>
</table>

![Table 13-10: Stages in the Development of Morality](image-url)
breaks down during a riot), he will, much like the amoral person, do what his selfish desires dictate and steal and loot.

The *conforming* person is familiar with and accepts the morals of his society, and does what is expected of him. He is an obedient child, a good student, becomes an industrious worker, and takes care of the needs of his family. But he has no compunction about being unkind or even cruel to his inferiors, if his status allows that, and may even be dishonest with outsiders if his group condones that. His definition of right and wrong is based on what others expect from him, not on a personal conviction of what is right or wrong. The character development of this person has stopped in late-childhood.

The *irrational-conscientious* person has internalized the morals of his society and tenaciously follows them. His thinking and behavior is governed by a rigid conscience, and he feels guilty if he fails to carry out all of his moral obligations, which includes responsibilities to his family, his religion and his country. The character development of this type of person is considered to have stopped during adolescence.

The *rational-altruistic* person has internalized the morals of his society but he does not follow them compulsively. He critically assesses the merits and demerits of prevailing rules of morality and takes into consideration the consequences of his actions. This is the character of the autonomous adult who considers morality as a matter of principles rather than rigid rules. The character development of this type of person is considered to have continued into and throughout adulthood.

Kohlberg’s (1969, 1981) three stages of moral development is an elaboration of Piaget’s theory. The Kohlberg theory was predicated on the assumption that there are three sequential stages of cognitive development, what he called preconventional, conventional, and postconventional. The preconventional stage predates the effects of socialization (we would call it the affective stage); the conventional stage is the product of emulation and education-based socialization (the mnemonic stage); and the postconventional stage is the highest level of moral achievement, the transcendence of reliance on the value system imparted by others through logical reasoning (the rational stage). Kohlberg illustrated some of the stages of moral development by quoting a single person’s answers at three ages to the question why one should not steal from a store. His answer at age 7 was: “Someone could see you and call the police.” At age 14 his answer was: “It’s one of our rules … If we didn’t have these laws … our whole society would get out of kilter.” At age 24 the same person had a different answer: “It’s violating another person’s rights, in this case to property.” According to Kohlberg, different individuals go through these stages of moral and character development at different rates, and some never reach the higher stages. Kohlberg was quite explicit that the *conventional* level is the standard level of moral development. However, as one with a lofty conception of human nature, Kohlberg believed that with advances in education more and more people would reach the highest stage.

The above approaches in the study of moral development were based on how children, adolescents and adults *reason* about ethical issues, rather than how they *behave* in daily life.
This approach has been widely criticized as being more a study of cognitive development than of moral development (Hogan, 1973; Lickona, 1976; Bandura, 1991). What a person will *say* is moral or immoral depends on what he has been taught, not necessarily how he *behaves*. Moral behavior in daily life is more a product of imitation, ingrained habits and routines, assimilated conventional beliefs—compulsive mental complexes that we call *mnemnons*. The individual’s moral development is dependent on emotional (compassion) and cognitive (reasoning) factors. But what determines how he will behave as a routine matter in daily life? That depends on whether he has interiorized the values and norms of the family, the society, and the culture in which he was reared.

**13.8.3. Morality Based on a Just Social Order.** During the Age of Faith and the early Renaissance, the prevailing Western view was that the evils of society (injustice, greed, poverty, crime, violence, and wars) were due to the moral failings of human beings as individuals. Hence to improve the social order, individuals were encouraged to become more ethical, whether by becoming more rational (Socrates, Aristotle, 1915a, b), better in controlling their emotions (Plato 360 BCE a, b; Stoics), leading a happier life (Epicureans), or turning to God for guidance (the Religious). Monarchy, it was argued, is a great political system; if it did not always work, that was due to the vices of bad kings or their advisors. The Church is a great spiritual institution; if it was corrupt, that was the fault of its venal leaders not the failure of the message or the institution itself. Personal immorality, it was argued, is not due to the moral influences of one’s upbringing but to the wickedness in oneself. If human behavior could be improved, society would also improve: hence individuals must be made to become more decent and upright. Favorite methods of indoctrination were preaching and threatening divine wrath.

That view began to change with the Enlightenment. It is not the masses of people that create an immoral society, the new intellectuals argued, but the prevailing political order that grants undeserved privileges to the nobles and the rich and exploits the commoners and the poor. A rigged system promotes immorality, not the inherent evil in individuals. By ensuring that society grants every citizen certain “rights” or “entitlements” in exchange for demanding from him certain “duties” and “obligations,” the social order could be greatly improved. It is the government’s responsibility to provide children with the best available medical, educational, and social support because that will increase the likelihood that they will become fit and productive adults. The same applies to the unemployed, disabled, sick and the old. In exchange, the government is justified to demand actions, services, and even sacrifices from everyone; such as, attending school regularly, obeying public laws, paying taxes, and performing other agreed upon obligations. Some social and political writers argued that men are basically good (Shaftesbury, 1711; Rousseau [Bertram, 2010]), but they become evil because they live in an immoral society: one governed by kings claiming divine rights for their arbitrary rule (Montesquieu, 1748; Locke, 1690, 1693), dominated by aristocrats owning much of the land and claiming social privileges, bamboozled by prelates using religion to support the prevailing unfair social order (Voltaire [Besterman, 1969]), and exploited by greedy manufacturers depriving laborers of fair wages for their work (Marx, 1867; Marx and Engels, 1848). Even though the details were different, all agreed that *a moral society should be based on a just social order*. 
Utilitarianism. For a society to endure there must be a workable relationship between the rulers and the ruled, employers and employees, neighbors and strangers, and among members of a family. Social laws, usually a combination of moral and legal rules, govern that relationship. The moral laws tend to be more enduring than the legal ones, since the latter, unlike the former, can be changed from one day to the next by autocratic edicts or public agreement. The moral obligations of the rulers and ruled need not be a symmetrical one. However, in the long run, those ruled must derive some benefit from their subordination or else there will be rebellion and disintegration of their society. In hierarchical societies, where different rules apply to the rulers and the ruled, it is advantageous to present the prevailing moral system as having divine or natural origin. In contrast, in modern egalitarian societies, the moral duties and rights of the ruled as well as the responsibilities of the rulers has to be rationally justified in terms of their fairness and efficacy. This new development has a cultural history that began with the rise of constitutional governments and the slow development of democracy and a theory, that of utilitarianism, which is gradually becoming transformed through debating, politicking and electioneering into a new negotiation- and compromise-based moral system.

Jeremy Bentham (1789) attempted to create an ethical social order that was based on three principles. The first, known as the hedonic principle, was the simplistic psychological notion that all human behavior is governed by two basic emotions, pain and pleasure. The second, known as the utilitarian principle, was that social and political legislation that gives people pleasure and makes them happy are morally right, while those that cause pain and unhappiness are morally wrong. As Bentham wrote:

> Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do, as well as determine what we shall do. On the one hand the standard of right and wrong, on the other the chain of causes and effects, are fastened to their throne.

(Bentham, 1789, p. 1. Italics in original)

If obtaining pleasure and avoiding pain are the goals of much of human endeavor, it follows that the promotion of human happiness and the prevention of human suffering are the only measures by which we can judge the moral merit or demerit of any social legislation. But since individuals have different needs and wants, and pursue different ends, how are we to judge the moral worth of a law? To resolve that, Bentham offered a third principle, that of “the greatest happiness of the greatest number.” Whatever legislation maximizes the happiness of the majority in a society and minimizes their unhappiness is morally right; whatever minimizes the happiness of the majority and maximizes their unhappiness is morally wrong. But how is one to assess people’s happiness or unhappiness? Bentham came up with the idea of a “hedonic calculus,” a presumed quantitative method to assess the sum-total of the positive consequences (pleasures) and negative consequences (sufferings) of any legislation.

Bentham’s strategy, as was pointed out by John Stuart Mill (1859, 1863) and others, was an unrealistic undertaking because there is no known way to assign a quantitative value to different pleasures and displeasures, to balance the pleasures of the individual and society, or to balance the pleasures of those living now and those who will be born in the future. While Mill
supported the general principle of utilitarianism because it promotes social justice, he offered several modifications. He warned against the “tyranny of the majority.” He maintained that it is impractical to demand that individuals constantly concern themselves with the promotion of the needs of society. And Mill stressed that the pursuit of aesthetic delight rates higher than seeking sensual pleasures. Mill argued that a society guaranteeing civil liberties—freedom of speech, freedom of assembly, and self-determination—is the foundation of modern ethics. But because every person has that right, unrestrained freedom leads to conflicts. Therefore, he added the principle that no individual has the right to engage in actions that harms another. As he wrote:

… the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others … Over himself, over his body, the individual is sovereign.  

(Mill, 1859, p. 14)

Constitutionalism. Although the utilitarian program with its unworkable idea of using a hedonic calculus to gauge the happiness of the majority was flawed, it did evolve into a political device of democratic rule through universal suffrage. Instead of intellectuals determining what is best for most people (a top-down approach), social programs are put up to the vote in free elections and referendums (a bottom-up approach), and programs that receive majority endorsement are adopted as the laws of the land. This is constitutionalism, a system of rules and regulations based neither on hallowed tradition or the dictates of an elite group, nor pressure from below by a rebellious mob, but a formal agreement between a people and their freely elected representatives as to what rules and regulations are fair or unfair, right or wrong. Moral principles that benefit no one are abandoned and replaced by new ones; and the latter are modified as practical experience necessitates. Contractual legislation—which in some democratic societies must conform to a written constitution and is subject to approval by a supreme court—is neither tyranny nor anarchy; the adopted laws should be justified and clearly spelled out and, once adopted, are as binding as the divinely sanctioned moral laws of the past. Constitutional rights and wrongs may be viewed as majority-approved social contracts about government entitlements and about citizen responsibilities to the government. Homosexuality is not evil because a love relationship between two individuals, irrespective of their gender, makes the two happy and harms no one. Advocating war when peaceful negotiations may resolve a conflict between two nations is not commendable patriotism but evil because it leads to unnecessary bloodshed.

The Problems with Legislative Justice. The rational program of public-private partnership in legislation is not working as well as expected. We argue this is due to erroneous assumptions made about human nature. Collectively, individuals are mostly irrational; despite their improved education, their judgments in elections rarely reflect political wisdom. Emotions and traditions play an important role in how people vote, and those elected are often not the best candidates with the right policies that will help most of the society. Because of all our individual differences, there are no perfect societies. Inequality and unfairness characterizes most human civilizations. Chiefs, kings, priests, and dictators have been subduing masses of people for millennia to create a hierarchical social order. In fact, that hierarchical organization
may be part of our hormonal and neural reptilian and simian heritage. The combination of (i) economic affluence created by modern agricultural and industrial technology, (ii) the democratic principle that grants everyone equal opportunity, and (iii) the justice system that grants equal civil rights to all, ought to have created an orderly and peaceful civilization. But democracy is still a work in progress. *Democracy treats everyone alike but individual human beings are very different from one another* (Bouchard et al., 1990; Deary, 2000). They are unequal in their abilities regarding the readiness to work, the quality and quantity of their output, and the value of their contributions to the common good. Those differences lead to *inequalities* in socioeconomic status, but worthy democracies aim to promote equality by offering *equal opportunities* to reach a higher status in society.

The laws on taxation are most indicative of fairness and rationality in democratic governments. But putting fairness into tax law is an extremely complex process. It helps to examine the tax revenues in the Organization for Economic Development countries (OECD). This organization collects a wealth of statistics regarding economic growth. How does the USA compare to other OECD countries regarding its tax revenues? USA total tax is only 27.3% of its Gross Domestic Product (GDP)—well below the OECD average (36.2%) and nearly 21% lower than Denmark, the country that collects 48% of its GDP in taxes (Fig. 13-30). Thus, USA taxes are among the lowest in the developed world—only slightly above Turkey, Chile, and Mexico. The Pew Research Center did an analysis of the tax revenue sources in the USA (Fig. 13-31). Less than 11% of total US tax comes from corporations; over 80% comes from payroll taxes and individual income taxes (Fig. 13-31A). When individual tax returns are sampled and grouped by adjusted gross income level, people making over $100,000 pay most of the income taxes (Fig. 13-31B). This looks like a fair distribution of progressive taxes in the USA. *But the bottom line is that the US Government is not collecting enough taxes to run the country without accumulating massive deficits.* There are three approaches to solving this problem. (i) Pass laws that collect more tax from the upper middle class and the wealthy, but they already pay most of the taxes. (ii) Increase the minimum wage and encourage employers to raise wages so that more households pay some taxes. Only 55% of American households make enough income to be taxed at all; wage-earners in the other 45% of households work hard but do not receive just wages for their labors. (iii) Pass laws to close “loopholes” used by corporations to avoid paying their fair share of taxes.

Regarding solution one: “Who will pay taxes and what proportion of their income will be taxed?” People who earn no more than what is needed for their subsistence cannot pay taxes. Hence the question becomes what proportion of their already low income should an average worker or a small businessman pay in taxes? What proportion of the very high income of business owners and financial speculators should be taxed? Proportional taxation that increases for higher income earners is the rational answer; the economic burden of parting with a little by the low earner is equivalent to the economic burden of parting with much more by the high earner. The data on marginal tax rates show that the rich are definitely not being taxed at a fair rate. In 2016, the highest marginal tax rate for USA households earning more than $470,000 is 39.6%. That is very low and is one of the reasons that tax revenues are far below what they should be. Marginal tax rates during World War II and until the early 1960s were in the high 80%-low90% range. The economy was booming in the 1960s and Kennedy
Cut the taxes to the low 80% range. Marginal rates continued to drop to the 70% range during the late 1960s and throughout the 1970s. But marginal tax rates dropped dramatically when President Reagan took office and are still abnormally low. One might expect this situation will lead to a clear political division of voters by income: those earning little vote for the “progressive” candidate who advocates raising the tax rates for the rich; and those earning a

Fig. 13-30. The percentage of taxes collected in the Organization for Economic Development (OECD) countries as a share of the gross domestic product (GDP) for 2008. The average rate is 36.2%—ranging from 48% in Denmark to approximately 23% in Mexico. The U.S. is far below average at 27.3%, indicating that not nearly enough taxes are being collected to run a fair and just government.

Source: OECD Tax Statistics, 2010
http://www.theatlantic.com/business/archive/2013/01/how-low-are-us-taxes-compared-to-other-countries/267148/
TAX ANALYSIS IN THE USA

A How the U.S. government is funded

<table>
<thead>
<tr>
<th>Year</th>
<th>Payroll taxes</th>
<th>Individual income taxes</th>
<th>Corporate income taxes</th>
<th>Excise taxes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1934</td>
<td></td>
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<td></td>
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<tr>
<td>1940</td>
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<td>1950</td>
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<td>1960</td>
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<td>2010</td>
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<tr>
<td>2015</td>
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</tbody>
</table>

Source: Office of Management and Budget
PEW RESEARCH CENTER

B Who pays income taxes? The rich, mostly

<table>
<thead>
<tr>
<th>Adjusted Gross Income</th>
<th>% of Returns Filed</th>
<th>% of Income Tax Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $15,000</td>
<td>24.3</td>
<td>0.1</td>
</tr>
<tr>
<td>$15,000 to $29,999</td>
<td>20.4</td>
<td>1.4</td>
</tr>
<tr>
<td>$30,000 to $49,999</td>
<td>17.8</td>
<td>4.1</td>
</tr>
<tr>
<td>$50,000 to $99,999</td>
<td>21.7</td>
<td>14.9</td>
</tr>
<tr>
<td>$100,000 to $199,999</td>
<td>11.8</td>
<td>21.9</td>
</tr>
<tr>
<td>$200,000 to $249,999</td>
<td>1.5</td>
<td>5.9</td>
</tr>
<tr>
<td>$250,000 and above</td>
<td>2.7</td>
<td>51.6</td>
</tr>
</tbody>
</table>

Note: Preliminary data are based on a sample of individual income tax returns filed between January and late September 2014, which are then weighted to represent a full year of taxpayer reporting.
Source: Internal Revenue Service
PEW RESEARCH CENTER
http://www.pewresearch.org/fact-tank/2016/04/13/high-income-americans-pay-most-income-taxes-but-enough-to-be-fair/

Fig. 13-31. A. A cumulative graph showing what proportion of the taxes are paid by groups in the United States between 1934 and 2015. The majority today comes from payroll taxes and individual income taxes (over 80%), far different from the proportions paid in the 1930s (less than 20%) when a large part came from excise taxes and "other." Note the high corporate tax rates present from the 1940s through the 1960s; today's corporate tax rates are too low. B. The table shows that most of the taxes are paid by people earning over $90,000 a year, and nearly 52% comes from households reporting an adjusted gross income of $250,000 and above. Recently, the number of households in that tax bracket has increased because of unequal wealth distribution. But marginal tax rates on the wealthy have not kept pace, and not enough taxes are being paid from the increased wealth.
lot vote for the “conservative” candidate who is opposed to raising tax rates for the rich. But this doesn’t usually happen because lawmakers that favor the rich carefully avoid such a clear statement of their real goals during their election campaigns. They pretend to support policies that will help the poor. Once they get into office, they support laws that favor less regulation on corporations and reduce tax rates on the wealthy. For an average voter who is busy trying to pay bills and keep a job, there is little time or inclination to understand complex tax policies associated with candidates for elections. They believe candidates who say raising taxes is a bad thing. Consequently, representatives responsible for biased tax legislation get elected and re-elected by appealing to the emotions and prejudices of the voters rather than by explaining what is good and rational about fair taxation.

Regarding solutions two and three: Another reason that tax revenues are too low in USA is due to the tremendous loss of high-paying manufacturing jobs In the United States. Millions of these jobs have gone to countries where cheaper labor is available. Those who had jobs in manufacturing are forced to find work in lower-paying service jobs—we call this shift in labor employment displacement. The hourly pay for service jobs is typically near or at the minimum wage, which is not sufficient to support a family. Because of low wages in a service economy, many households require more than one wage-earner to pay the mortgage and make car payments. Every year, the cost of living goes up, but the wages do not advance accordingly. People work more hours just to keep themselves in a home and have enough food for their families. Ironically, many American corporations are guilty of closing large manufacturing plants here and moving operations elsewhere; many move their main corporate offices offshore to countries that charge them no taxes. The laws that allow corporations to do this greatly undermines the US economy. The executives and stockholders of these corporations make enormous amounts of money in saved labor costs and taxes; consequently, their income levels soar. Unfair wealth distribution is one of the greatest social problems in the USA. The top 1% of American households got 95% of the real income growth since the recovery from the Great Recession in 2007-2009 (Table 13-11). Indeed, the income gap in the United States is widening (Fig 13-32) and is approaching the same level as the gap that existed before the great depression in 1929. We are living in a system that rewards greed. The USA has the highest income gap between rich and poor among developed countries. The average worker in America feels dissatisfied with the economy and anger is building up in the population.

Government is an expensive institution; to provide adequate public services, taxation is necessary to pay the bills. People demand good public services—clean streets, reliable garbage removal, adequate police protection, safe roads, bridges and highways, and the like. People also demand fair treatment by businesses who sell them products, lend them money, educate them, and take care of them when they are sick. But all of us are reluctant to part with our hard-earned money to pay taxes for these indispensable services. Possibly, the root of all these problems and the biggest obstacle to their solution comes from laws permitting public funding of election campaigns. That opens the doors to corruption. Political campaigns are expensive and depend on contributions to buy advertising. Once elected, legislators will pass laws that promote the interests of those who paid for their campaigns rather than pass laws that promote the common good. So, corporations and wealthy individuals “buy” legislators with their small contributions relative to the big payoffs they will receive from biased tax laws. But
the fact remains that sensible government laws to regulate corporations are a necessity because most corporations are amoral and have only profit motives. Yet, politicians pride themselves on saying that they are against raising taxes, against raising the minimum wage, and against corporate regulation for a variety of irrational reasons—for example, regulations and higher wages are “job killers.” Imagine a well-informed candidate who comes up with a detailed plan to improve conditions in his district and, to accomplish that, asks voters to approve a substantial tax hike. He will predictably lose to an opponent who, instead, promises to reduce taxes by arguing that handing over money to the government is just wasted on incompetent bureaucrats and dishonest contractors. Consequently, important public works projects or public protection from immoral business practices are not accomplished.

American inequality is a source of unrest and a major threat to maintaining the oldest democracy in the modern world. The polarized political climate in America splits the populace into two nearly-equal halves. Ironically, the more conservative half are composed of those voters who are most damaged by the current economics. Generally, these people will vote against their own interest for a smaller government, lower taxes, increased defense spending, and less spending on government programs that would create jobs. These policies will provide more money to the wealthy and not help the average person. Unfortunately, conservative politicians are very cunning in emphasizing social policies (“family values”) against gay rights,

<table>
<thead>
<tr>
<th>Table 13-11: Recent Real Income Growth in the U.S.A.</th>
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<tbody>
<tr>
<td><strong>Real Income Growth by Groups</strong></td>
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<tr>
<td><strong>Average Income Real Growth</strong></td>
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<tr>
<td><strong>Top 1% Incomes Real Growth</strong></td>
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<tr>
<td><strong>Bottom 99% Incomes Real Growth</strong></td>
</tr>
<tr>
<td><strong>Fraction of total growth (or loss) captured by top 1%</strong></td>
</tr>
<tr>
<td><strong>(1)</strong></td>
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<tr>
<td><strong>(2)</strong></td>
</tr>
<tr>
<td><strong>(3)</strong></td>
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<tr>
<td><strong>(4)</strong></td>
</tr>
<tr>
<td><strong>Full period 1993-2012</strong></td>
</tr>
<tr>
<td>1. <strong>Clinton Expansion 1993-2000</strong></td>
</tr>
<tr>
<td>2. <strong>2001 Recession 2000-2002</strong></td>
</tr>
<tr>
<td>3. <strong>Bush Expansion 2002-2007</strong></td>
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<tr>
<td>4. <strong>Great Recession 2007-2008</strong></td>
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<tr>
<td>5. <strong>Recovery 2009-2012</strong></td>
</tr>
<tr>
<td>6. <strong>Average Income Real Growth</strong></td>
</tr>
<tr>
<td>7. <strong>Top 1% Incomes Real Growth</strong></td>
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<tr>
<td>8. <strong>Bottom 99% Incomes Real Growth</strong></td>
</tr>
<tr>
<td>9. <strong>Fraction of total growth (or loss) captured by top 1%</strong></td>
</tr>
<tr>
<td><strong>(1)</strong></td>
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<td><strong>(2)</strong></td>
</tr>
<tr>
<td><strong>(3)</strong></td>
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<td><strong>(4)</strong></td>
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<tr>
<td><strong>Full period 1993-2012</strong></td>
</tr>
<tr>
<td>17.9%</td>
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<tr>
<td>86.1%</td>
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<tr>
<td>6.8%</td>
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<tr>
<td>68%</td>
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<tr>
<td><strong>Clinton Expansion 1993-2000</strong></td>
</tr>
<tr>
<td>31.5%</td>
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<tr>
<td>98.7%</td>
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<tr>
<td>20.3%</td>
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<tr>
<td>45%</td>
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<tr>
<td><strong>2001 Recession 2000-2002</strong></td>
</tr>
<tr>
<td>-11.7%</td>
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<tr>
<td>-30.8%</td>
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<tr>
<td>-6.5%</td>
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<tr>
<td>57%</td>
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<tr>
<td><strong>Bush Expansion 2002-2007</strong></td>
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<tr>
<td>16.1%</td>
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<tr>
<td>61.8%</td>
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<tr>
<td>6.8%</td>
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<tr>
<td>85%</td>
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<tr>
<td><strong>Great Recession 2007-2008</strong></td>
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<tr>
<td>-17.4%</td>
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<tr>
<td>-36.3%</td>
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<tr>
<td>-11.6%</td>
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<tr>
<td>49%</td>
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<tr>
<td><strong>Recovery 2009-2012</strong></td>
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<tr>
<td>6.0%</td>
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<tr>
<td>31.4%</td>
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<tr>
<td>0.4%</td>
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<tr>
<td>95%</td>
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</tbody>
</table>

Computations based on family market income including realized capital gains (before individual taxes).
Incomes exclude government transfers (such as unemployment insurance and social security) and non-taxable fringe benefits.
Incomes are deflated using the Consumer Price Index.
Column (4) reports the fraction of total real family income growth (or loss) captured by the top 1%.
For example, from 2002 to 2007, average real family incomes grew by 16.1% but 65% of that growth accrued to the top 1% while only 35% of that growth accrued to the bottom 99% of US families.
INCOME INEQUALITY IN THE UNITED STATES

Fig. 13-32. Data showing various measures of income inequality in the United States. **A.** Since 1989, wealth in the United States has not increased for the lowest 50% of households; in contrast, wealth increased from 20 trillion to 51 trillion in the top 10% of households. **B.** The top 1% hold over 40% of the wealth shares in the U.S. The top 0.01% are fabulously wealthy and hold over 10% of all the wealth in the U.S. These data are the basic evidence that wealth distribution in the U.S. is unjust and immoral.

From: http://inequality.org/wealth-inequality/
women’s rights, minority rights, and foster the government support of Christianity over other religions. These politicians have nearly universal disparagement of Islam. All in all, far right policies severely limit individual freedom.

The other half of the electorate, the liberal and moderate voter, supports politicians who are willing to raise taxes on high income earners, advocate for increased personal freedom, substantial increases in the minimum wage, staunch support for each person to worship in their own way, increased educational opportunities, and government programs that would provide good-paying jobs to replace those lost to developing countries. But these politicians will not slander other religions or other life-styles to emotionally rouse their “base”—the most ardent supporters.

Here is where human neuropsychology comes into politics: the irrational arguments of far-right demagogues are much more appealing to a dissatisfied voter than are the rational arguments put forth by politicians who espouse policies that would directly aid these voters. To add more confusion to the toxic divisions in the US electorate, the recent increase in biased talk shows on radio and television have become highly popular. These shows create an alternate universe of non-facts that people believe are true. Thus, many voters are not only misinformed about what is happening, but they believe the opposite to be true. One of the best examples of this kind of ignorance is the denial of climate change by many conservative politicians. This hoax is supported by lobbyists and powerful corporations in the oil and gas business. Their chief strategy is to recruit pseudoscientists to sow seeds of doubt about the well-documented scientific evidence. Nobody can argue with a thermometer, but most of the American populace is just not concerned with the looming catastrophe that climate change will bring—most probably within this century.

FINAL COMMENT: JOSEPH ALTMAN 1925-2016

With the above chapter, the written thoughts of Joseph Altman came to an end. His last hours of work were on April 15, 2016. He died on April 19, 2016. I edited his last chapter to eliminate repetitions and polish the language to make it more readable. I was greatly helped by his daughter, Magda Elizabeth Altman, who provided some insights on reorganizing the chapter into a more logical arrangement of his last thoughts. It is with great pride that I present this chapter so that his major work can be considered complete.

Shirley Bayer Altman, December 10, 2016.