

# 1

## Mind and Meaning

### The First Step in Understanding Perception

Clip a half-dozen cartoons out of magazines. Cut off the captions; then place the pictures face-down in one pile and the captions face-down in another. Scramble the piles, and randomly pair each caption with a picture. Then turn over the pairs. You will have a whole set of brand-new jokes. In spite of the fact that the combinations were determined by chance, at least half of them will be funny! Try the same thing with advertisements (separate pictures from key phrases); once again, the results will be uncanny: ironic, poetic, or humorous. This simple experiment demonstrates the most fundamental process of the human mind: the attribution of meaning to things and events in the outer world. Creating meaning is an automatic process: your mind does it whether you want it to or not. How and why this happens is the subject of this book.

#### THINKING ABOUT PERCEPTION

Many factors influence how (or whether) we find meaning in things and events in our environment. Psychological research often creates the impression that the principles of perception are rather clearly delineated and can be scientifically measured. In comparison to laboratory experiments, however, real life (and art!) is much less predictable and much more complex, mysterious, and surprising. Although perception is subject to a number of influences that are familiar to you, you probably do not often think about these. Before going on to examine visual perception in particular (an examination that comprises the rest of the book), let us first look at perception in general. What is it? What does it do? How and why does it do it?

#### Projection and Expectation

The venture into creating new jokes suggests just how imaginative the human mind can be: a person instantly perceives even random or accidental events as meaningful. Even when relaxing, your mind persists in spinning out meaning—seeing identifiable images in clouds, rock formations, gnarled wood, stains on the wall. Such projections of meaning often say more about your mental processes than they do about the stimulus; this is the basis for psychologists' projective tests. The Rorschach test, for example, uses a person's responses to inkblots as a way of analyzing personality (see figure 1-1).

Projection is a part of other familiar activities such as astrology, Tarot readings, and the I-Ching (*Yi-jing*). In these, people project their own personal concerns onto established frameworks of meaning in order to discover new perspectives on their lives. Projection is also fundamental to science, even though we usually think of science as a method for avoiding projection: scientific data are meaningful only when they can be made to represent an extended projection of concepts that already exist in the minds of scientists. Because scientific concepts are constantly open to reevaluation, the same data are sometimes given different interpretations—new meanings—by subsequent investigators.

An example of projected meaning is the Clever Hans phenomenon. Hans was a horse who belonged to a retired Berlin school teacher, Wilhelm von Osten, during the early 1900s (see figure 1-2). Many people of the time, including prominent scholars and scientists, firmly believed that animals could think in human ways—if they were properly

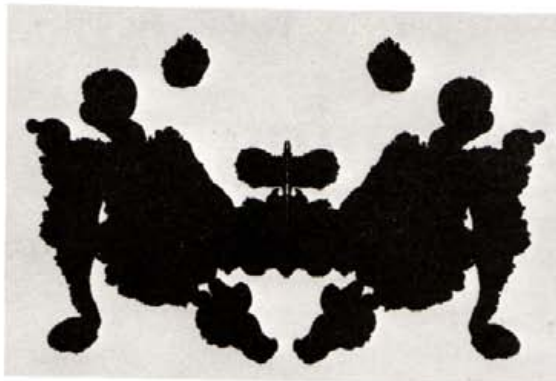


Figure 1-1. How many different things can you see in this inkblot? (Joyce Burnham and Rachel Robertson)

taught. Hans was taught to answer questions by tapping a front hoof a certain number of times to indicate a particular number or letter of the alphabet. He was thought to be able to compute arithmetic problems, to read and spell, and to solve problems of musical harmony. By 1937 more than seventy dogs, cats, and horses had been taught to "think" in similar ways.

Apparently, Hans was extremely sensitive to his master's slightest movement. When the horse reached the correct number of knocks, von Osten unconsciously relaxed, giving a subtle and involuntary head motion which Hans detected. Because von Osten and others expected Hans to exhibit human intelligence, they interpreted the horse's behavior as proving the truth of their beliefs. Similar projections occur when people watch animals perform at circuses and zoos, where the context is carefully constructed to give the illusion that the animals' perceptions are the same as those of the audience. Comparable interpretations have been made of modern experiments with teaching human language to chimpanzees, gorillas, and dolphins; however, contemporary researchers are well aware of the Clever Hans phenomenon and design their studies to meet sophisticated and complex scientific criteria.

In a controversial educational study, school teachers projected their expectancies onto their pupils (Rosenthal and Jacobson 1968). The teachers were told (falsely) that test results had predicted that certain pupils were due to bloom intellectually during that school year. The teachers'



Figure 1-2. Wilhelm von Osten and Clever Hans, c. 1905. (The New York Public Library)

positive expectations led them to favor these students unconsciously—for example, by giving them more time to answer questions and more encouragement, praise, and help. By the same token, the teachers responded unfavorably to pupils who made intellectual gains that were not expected. The researchers named this self-fulfilling prophecy the *Pygmalion effect* after a Greek myth in which the sculptor Pygmalion fell so much in love with a statue he had created that the goddess Aphrodite brought it to life. Although the Pygmalion study has been criticized on ethical grounds, its dramatic findings brought about a greater awareness of how expectancies affect both perception and behavior in interpersonal contexts.

### Memory

Researchers have long known that people memorize words much faster than nonsense syllables and forget nonsense syllables much more quickly. Patterns (for example 4589) are recognized more easily than meaningless arrangements of the same elements (for example, 3375). Memory-improvement techniques associate meaningful mental imagery with arbitrary series such as telephone, social security, or zip-code numbers. For example, the number *four* might be represented by a table with four legs; *five* by a hand, and *seven* by a policeman facing you with his right arm extended. To remember the number, you would first recall the meaningful image (a giant hand holding a table with a traffic policeman standing on top of it), and then decode it (547). Kinesthetic, auditory, and spatial types of

imagery have also been favored as mnemonic devices (memory aids) since ancient times. Ideas or items to be remembered are associated with parts of one's own body, the rhythm of a sing-song chant, or with walking through a familiar place, such as a building, house, or garden. These techniques appear inefficient: they seem to demand more mental energy than does simple memorizing. However, such memory aids are common worldwide, they correspond to the multiple intelligence capacities of the human mind, and they have persisted throughout human history. In cultures with mass literacy, emphasis on memory skills tends to decline because knowledge can be stored in and retrieved from written documents instead of in people and objects. (Compare what you had to memorize in school with what was required of your parents and grandparents.) But most of all, these techniques underscore the supreme importance of meaning for the human mind.

### Selectivity

Your mind cannot give equal attention to every stimulus that impinges on your senses. Conscious perception is selective; your mind pretends that some things do not exist. As a consequence, you do not experience everything in the world as equally meaningful. In fact, when you find yourself trying to pay attention to too many meaningful perceptions at once, you experience overload.

The selective aspect of perception is evident from the first day of life. Newborns prefer looking at patterned cards as opposed to plain ones. Infants also find complex patterns (such as stripes, bull's-eyes, and checkerboards) more interesting than simple patterns (such as crosses, circles, and triangles), and they direct their gaze toward spheres more often than toward flat circles. By four months of age, babies respond more frequently to patterns that resemble the human face than they do to scrambled features or featureless patterns (Fantz 1961). Even adults instantly perceive a face where it does not exist (see figure 1-3). Hence, from its earliest moments, the human visual system is involved in scanning the environment and selecting out certain stimuli (such as facelike configurations) as more meaningful than other stimuli.

### Habituation

Some aspects of selective perception result from habituation: your mind tunes out stimuli that are



Figure 1-3. Decaying taillight. (Fred H. Stocking)

constant (monotonous) or repetitious and predictable (boring). For this reason, you often become aware of familiar noises (such as household appliances and city traffic) only when they stop (that is, change). If for some reason you are forced to pay attention to such stimuli (as in a factory assembly-line job, or during lengthy turnpike driving), your mind will persistently try to tune them out, and you are likely to find yourself falling asleep or daydreaming. The loss of alertness that attends monotony and boredom can have life-or-death consequences in some situations, and it is all the more problematic for being a natural response. Human perceptual systems require variation and change in order to function; when exposed to steady-state conditions, your sense receptors cease to function.

### Saliency

Since the stimuli you tune out remain invisible, you may feel astonished if you discover them. When your best friend is wrapped up in automobiles, art,

rock music, birdwatching, or the like, you are made aware of a whole new world. Consider, too, the new-word phenomenon. A new word in your vocabulary suddenly seems to appear everywhere, as if the whole world had suddenly taken a fancy to it. But the word was always in use; you simply overlooked it before, because it was not meaningful to you. When something acquires personal meaning, it ceases to stay in the background, instead becoming a conspicuous or salient figure in the individual's consciousness.

When a different picture was shown to each eye of experimental subjects, the perceptually salient pictures were those that represented familiar objects in the subject's own culture; pictures of unfamiliar (and therefore essentially meaningless) objects from other cultures were tuned out (cited in Cole and Scribner 1974). Familiar faces, too, have a special perceptual salience; for example, notice how your own face or that of someone you know well stands out more than the faces of people you do not know (see figure 1-4). Sometimes people become painfully alert for certain stimuli, as when someone with a fear of spiders sees what appears to be a spider in a spot on the wall. This hypersensitivity is called *perceptual vigilance*.

### Normalizing

In one study, the word *chack* was read as *chick* in a sentence about poultry raising, and as *check* in a sentence about banking. The readers' minds corrected the stimulus. Instead of being alert to unexpected irregularities, they tuned out or normalized the stimulus so that it could be perceived as familiar and uncomplicated. In laboratory studies, subjects usually require many repeated exposures to irregular or anomalous patterns (such as a black eight of hearts) before they begin to pick up on the anomalies; even then, their initial responses take the form of vague discomfort rather than of direct recognition. This tuning out is known as *perceptual defense*, the opposite of perceptual vigilance.

You may have experienced situations in which some part of your mind was aware of odd goings-on but another part refused to attribute unusual or threatening meanings to the situation. This is because, whenever possible, perception encourages us to experience what is probable in a situation, rather than what is possible. In this way, our perceptual systems simplify our world and keep it predictable.

### Dissonance

Sometimes two or more perceptions seem to conflict with each other. You cannot tune out either one, and yet you are unable to accept them both—as, for example, when you distinctly remember placing the car keys in your pocket, but they are not there. You vacillate between two (or more) sets of possible explanations, each requiring you to reject the other(s). Such situations—particularly when your perceptions seem to be at odds with those of people around you—can be deeply upsetting. When one person intentionally creates such a condition to manipulate another, it is sometimes called *gaslighting* after a popular turn-of-the-century stage play *Gaslight* (basis for the 1940s movie) in which the husband attempted to drive his wife insane by doing such things as gradually lowering the gaslights and then denying to her that they had dimmed.

### Words

Words have an amazing power to affect your perceptions of meaning. Often, simply naming a stimulus is enough (as when a doctor gives your symptoms a scientific name, or when you finally remember someone's name). Nothing has really changed, except that you somehow feel better. Identification by naming is the basis of innumerable activities, such as education, hobbies (such as birdwatching and antique collecting), medical diagnosis, and astronomy.

Words direct people's perceptions of art. Western artists and theorists often assert that an artwork should not need verbal explanations—that it should stand on its own. For this reason, some modern artists simply number their works or leave them untitled. But if art objects did indeed speak for themselves, you would not have to enroll in art history courses in order to understand them, and you would probably not be reading this book. It is a truism of perceptual experience that, the more you know, the more meaning you can perceive and the more (or less) satisfying an image becomes.

### Closure

When you have successfully resolved the problem of meaning, you experience closure. The term *closure* was originally applied by Gestalt psychologists to the phenomenon of identifying a discontinuous figure as a continuous or unitary image. It is now commonly applied to the more general experience of identifying and classifying a stimulus (*Aha! I see!*)

in such a way that the observer feels free to move on to something else. Depending on the importance of the stimulus, closure is usually accompanied by feelings of relief.

Habituation, perceptual salience, normalizing, and words are ways of keeping closure unproblematic. Situations that involve perceptual dissonance make people uncomfortable because under those circumstances closure feels difficult or impossible. When closure is too difficult, people are likely to feel frustrated and, if possible, may attempt to reject the stimulus. When closure is easy, the stimulus attracts but does not hold their attention (see figure 1-5). Advertising is designed to provide instant, uncomplicated closure. As a consequence, the advertiser must constantly present fresh new images in order to entice viewers into seeking closure. Certain stimuli continue to hold interest even after repeated exposure. This is the quality people usually associate with great artworks ("Every time I look at/listen to/read it, I find something new!")

*Puzzles.* Despite their need for closure, people often flirt with postponing it. Multimillion-dollar businesses exploit the public's perennial willingness to delay closure, as with crossword puzzles, jigsaw puzzles, cryptograms, mystery stories, and suspense movies. In all of these situations, however, people feel secure in anticipating that they will eventually arrive at closure: the puzzle has a solution, the writer or filmmaker will eventually clear up the mystery, and the joke's punch line will (or had better) be worth waiting for. As long as closure is promised and yet is not at hand, the audience's attention is captured.

#### Other People

In a now-classic series of studies, psychologist Solomon Asch (1956) observed how perceptual behavior was affected by the presence of other people. Asch devised a situation in which small groups of people were given a line and asked as a group to decide which in a series of other lines matched it. In every instance, the correct match was obvious; no subtle discriminations or measurements were required. But only one person in the group was the actual subject; unbeknownst to him or her, the others were collaborating with the experimenter. Most of the time the group reached a consensus easily, but occasionally the collaborators would insist that mismatching lines were equal in length. About



Figure 1-4. President Kennedy, 1962. (Tony Spina)

three-fourths of the time, a subject would eventually deny his or her own correct perceptions in favor of conforming to the group consensus—even though the group was clearly wrong (see figure 1-6)!

Subsequent experiments explored this phenomenon further. In one situation, an innocent subject sat in a small waiting room adjacent to an office. Smoke was piped into the room through the air-conditioning system. Immediately upon smelling the smoke, a solitary subject would alert the secretary in the office (a collaborator in the experiment) or would leave the room to look for a custodian. When other people (collaborators) were present in the room, however, the subject did nothing, even when the air became so smoky that everyone was coughing and their eyes were watering. Similarly, if a loud crash and a scream came from the adjoining office, a solitary subject immediately entered the office to investigate, but did nothing in the presence of others who were nonresponsive. When other people did not appear to share the subjects' perceptions, they tended to deny them—or at least to refrain from acting on them.



Figure 1-5. Common signs are designed to provide instant closure. Geometric and uncomplicated shapes prompt automatic recognition. Because meaning is immediately apparent, we can respond quickly and without confusion.

The findings of Asch and others suggested that the presence of other people exerts a powerful influence on individual action, suppressing behaviors that people might otherwise make in response to their perceptions. For Americans, who value individualism and personal initiative, such findings were profoundly disturbing.

**Culture.** Western ideology tends to assume the autonomy of the individual, but studies in evolution, primatology, and anthropology suggest that people are basically social. Since the emergence of our earliest hominid ancestors, human beings have always lived in groups. People learn their perceptions from other individuals to a much greater extent than is the case with other animals (even social species such as lions, baboons, and wolves), for whom a greater proportion of perceived meaning is genetically patterned (or instinctive).

Culture is the most prominent nongenetic influence on human perception. Other people teach you what is real: how to respond to your perceptions, and how to think about, talk about, and understand their value and significance. You learn the culturally acceptable ways to attribute meaning to your personal experience (socialization). Human infants always acquire the language, perceptions, thought patterns, and behaviors appropriate to the culture in which they are reared, regardless of who or where their biological parents may be. Culture, then, constitutes a set of collectively accepted parameters for gauging the nature of things, a perceptually shared reality, a world view.

**Deviation.** Marching to a different drummer can exact a high price. In our culture, individuals whose perceptions are at odds with those of others are

often considered weird or even insane. People who attribute bad or good things that happen to them to plots, conspiracies, or a divine plan are said to suffer from paranoia or delusions of grandeur, and those who seem to live in their own world are considered schizophrenic. Depression and suicide are associated with an overwhelming failure to perceive the same kinds of meaningfulness as other people do. Those who do not participate in the mainstream of cultural meaning are often segregated from the general population (in prisons, mental hospitals, or ghettos). Even artists are commonly viewed as peripheral to real life. By contrast, in many other societies, the different individual is given a special role (for example, the *berdache* of the Native Americans of the Great Plains) or is thought to have special powers that are useful to the group (for example, the shaman).

**Artists and Innovators.** Most people tolerate a certain amount of meaningfulness in their lives: indeed, they must develop such tolerance in order to get on with things. People who expect life to be a neat package, with everything in its place, are doomed to disappointment. Certain people, however, seem to have an unusual ability to withstand—or even prefer—a larger amount of disorder and chaos than normal; this characteristic is found in artists, writers, and scientists who are mature (over 40 years old) and highly creative (Barron 1958). Western studies of these “crazy” artists and “mad” scientists suggest that they perceive unusual or new meanings in situations that are experienced as chaotic or disordered by most other people. Further, they are likely to pursue, maintain, and act on their individual perceptions—like the 25 percent of Asch’s subjects who refused to go along

Figure 1-6. Drawing by Vietor;  
©1978 The New Yorker Maga-  
zine, Inc.



"Wait a minute, you guys—I've decided to make it unanimous after all."

with the group consensus when it was at odds with their own perceptions. While psychologists label this trait *independence*, friends and relatives are more apt to call it *stubbornness* or *pig-headedness*. Some cross-cultural research suggests that these artistic personality characteristics are consistent from one culture to another.

Most people do not usually share an innovator's need for rethinking things; indeed, they actively avoid becoming involved with unfamiliar, discomfiting, or mind-boggling ideas. For these reasons, new theories (which are based on new perceptions of meaning) often meet with strong opposition (such as Galileo's sun-centered universe, Darwin's theory of evolution, and nuclear winter). Artistic innovations often meet similar hostility: *How can you call that art? My five-year-old could do that! They could hang it upside down and nobody would know the difference!* A respected nineteenth-century critic reacted to Impressionist paintings by saying "You might as well give a monkey a paint-box!" Some present-day art critics have characterized computer-assisted art as cold and soulless.

## THEN WHAT IS PERCEPTION?

The term *perception* is commonly used in a number of different ways. It can refer to responses of the nervous system to external stimulation (sensation), or to primitive awareness—as in "I perceived a sudden movement out of the corner of my eye." At the other extreme, *perception* can refer to more complex and higher-level thought processes (cognition)—as in "I perceived deep religious qualities in her paintings." Until recently, psychologists de-

defined *perception* as an intermediate step in the upward relaying of primitive sensations to higher levels of processing, in accordance with the traditional simple-to-complex hierarchy of sensation/perception/cognition (see figure 1-8). Current research in physiology, psychology, anthropology, and cybernetics, however, suggests a richer and infinitely more complex picture. Perception is thought to be less determined by sensory stimulation, and equally (or more) controlled by cognitive factors such as expectancy, normalizing, and verbal coherence. In other words, the flow runs top-down as well as bottom-up (see figure 1-8).

To review, at least four overarching processes shape perception: mental operations that affect how we attribute meaning to stimuli (for example, habituation, salience, normalizing, dissonance, and closure); the effects of words on perceived meaning; the interplay between perception and behavior (for example, the presence or absence of other people); and the framing of both perception and behavior by social or cultural context (for example, learning, socialization, deviance, creativity). In this book, visual perception is explored as a mediating process that fuses simple sensation with high-level cognition so that your experience of meaning will be unified and coherent.

### Perception and Sensation

Psychologist James J. Gibson (1966, 1979) and others have pointed out that people are not consciously aware of their sensations—the excitation of nerve fibers. For example, you hear a sound; you do not feel your eardrums vibrate. As I pick up my teacup, I feel the cup, not my fingers. You are not aware of sensations themselves, but rather of the meaning-