

## ENVIRONMENTAL PERCEPTION AND COGNITION

Environmental perception deals with the process through which the individual organizes the real world stimulation and derives cohesive, meaningful and integrated picture of the real world settings. In other words, the process of apprehending the features of the immediate physical environment through sensory input is called environmental perception. The process involved in environmental perception is closely related to and interacts with other processes pertaining to environmental cognition and attitudes. All these three processes constantly influence each other. Environmental cognition refers to the process by which information is categorized, sorted, organized and structured, and placed in meaningful categories. The process of evaluation goes one step beyond cognition. It refers to the addition of values and preferences to structured cognition. People act on the basis of the information that is collected (perception), encoded (cognition) and judged (evaluation).

The emphasis of environmental perception is on questions dealing with how people perceive a complex array of many objects or molar environment. For instance, residential complexes, neighbourhood, factories and office setting are subject matter of studies of environmental perception.

People are surrounded by the large-scale environment. Thus, perception of surrounding requires constant movement. To examine all aspects of the surrounding adequately and completely, multiple perspectives are essential. Environmental perception extends beyond simple observation to exploration from different vantage points.

Another unique feature of environmental perception is related to purposive action. When an individual encounters the environment he actively explores, sorts and categorizes the inputs, which he receives from actions in the said environment, which are not random but purposefully directed.

Thus perception attempts to explain how we become aware of information in our environment, how we process that information and how we give meaning to that information which eventually leads us to respond to it in one way or another.

*Bottom-up theories* of perception focus on how the information itself and ultimately the environment determine our interpretation. *Top-down theories* of perception focus on how our stored previous experiences influence our interpretation of new information. Any universal theory of perception, however, must include both bottom-up and top-down processes. It is

difficult to conceive of a situation where the information itself and its context (the external or bottom-up aspects) will not be important in providing cues to aid our interpretation. The memory from the past is located internally and its use in helping to give meaning to the experience illustrates the top-down approach. Previous experience will also be important in determining our emotional reaction.

As we grow and develop, we encounter a wide range of information which increases in complexity with the complexity of encountered environments. We develop *cognitive schemata*, *blueprints*, or *cognitive maps* of our world, which guide our perceptual processes. The essential aspects of this guidance are *filtering of*, and *giving meaning to* incoming information from the environment. Filtering occurs at all stages in the process and determines what aspects we attend to, what aspects we store in memory, and the aspects to which we respond. Any consistency over time within an individual's behaviour can be partly explained in terms of similarity or continuity between situations (the *environmental factor*) and partly in terms of the development of particular cognitive styles reflecting stability in cognitive schemata – an enduring cognitive map of the world (the *individual factor*).

Environmental perception adopts a holistic approach which focuses on perception as a total process in the natural environment. The aim is to understand how we perceive the real world and from this understanding to devise ways in which we can improve it.

In making the transition from the laboratory to the real world, the psychology of perception went through several phases. In the beginning there were the Gestalt theorists who focussed on the phenomenological world rather than the objective world of the individual. This was challenged by the Ecological theorists who focussed on the physical environment. Meanwhile the Constructivist approach evolved from the Gestalt roots. After that the Interactionists tried to incorporate the phenomenological and the physical under the theme of transaction.

### **The gestalt Approach**

Originating in the work of Kohler (1929, 1940), Koffka (1935) and Wertheimer (1944), it focussed on the world that exists within the mind as opposed to the external physical and social environment. They talked of the '*phenomic*' world which was what determined behaviour. According to the Gestalt school, studying aspects of the external environment is irrelevant since it is the picture of that external world that people have inside their heads

which motivates and directs them. Koffka (1935) described this internal or phenomic world as the behavioural environment.

### **The Ecological Approach**

The Ecological approach developed in response to the Gestalt school and was reflected in the work of Brunswick (1947, 1957) and Gibson (1950, 1979).

#### Brunswick's ecological validity

Brunswick's theory of perception is referred to as the *lens model* and is based on the probabilistic nature of the perceptual process. He was concerned with ecological validity of perceptual cues and with the need to understand the outside or environmental aspect in perception. He argues that environmental cues contain information which is more or less accurate in terms of representativeness of the external world. The perceptual processes sample these environmental cues and make probabilistic judgements about them which lead to the perceptual representation. Essentially he sees the process being driven from the bottom-up, with the person reacting as a physiological organism. Elements of Brunswick's theory are similar to the more directly environmental approach of Gibson.

#### Gibson's affordances

Gibson's ecological theory is a bottom-up theory, with a focus on the fundamental properties of the external world in generating a perceptual repertoire. Gibson argues that all stimuli in the environment contain information and the researchers are to determine how stimuli provide the information, which Gibson calls the "laws of stimulus information" (Gibson, 1950). Gibson defined stimuli in a molar sense whereby persons perceive total environments and not just an accumulation of parts. He argued that it was important to describe the process of perception but the process is to be found in "the invariants from the flow of stimuli" (Gibson, 1979), not in the sensory system. The organism is equipped with the physiological means to perceive, and this equipment responds to the information contained in the external world by producing a perceptual image. This was a physiological response to a physical stimulus which did not involve any construction on the part of the person. Gibson saw meaning as existing in the physical environment in terms of affordances. According to Gibson (1979), "The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or evil". According to him, affordances determine perception.

## **The Constructivist Approach**

In the area of perception Neisser (1976, 1987) and Gregory (1966, 1973) adopted a constructivist position.

### Seeing and Thinking

Neisser distinguishes between two aspects of perception. The first is seeing a process which is fairly passive and driven by the information contained in the environmental stimuli (accords with Gibson's model of perception). The second involves thinking and this is where top-down or constructivist aspects intrude. Neisser proposes a perceptual cycle which involves attention, motivation and perceptual processes in a dynamic process being stimulated by and acting upon information from all sense modalities. Whereas Gibson saw the person as reacting to the information in the natural environment, Neisser saw the person as actively exploring their world. They are guided by the cognitive schema they have developed, which are in turn continually being modified in the light of new information.

### From illusion to perception

Gregory (1966, 1973) suggests that the individual's previous experience, stored in memory, is all important in the process and his theory is therefore top-down. For Gregory too, perception involves the higher level cognitive elements involved in thinking.

### An alternative construction

George Kelly (1955) proposed a theory of personal constructs based on his experience as a clinician. Central to the theory is constructive alternativism which is embodied in the proposition that there are as many different forms of reality as the individual is capable of constructing. Constructions of reality for any individual will be limited by the range of his or her experience. In its extreme the approach holds that the world of the schizophrenic is as real as the world of the scientist.

Thus according to the theories of Brunswick and Gibson, external physical reality plays an important role in providing the information in the perceptual process – a role of physical realism. On the other hand, the theories of Gregory, Neisser, and Kelly focus on constructivism and the importance of psychological or phenomic world. However, none of these theories presents an equitable role for person and environment in the process. They

imply that person and environment can be meaningfully studied as separate entities. *An alternative view* is found in the *transactional approach*.

### **Transactionalism**

The transactional approach considers the person and the environment (subject and object) as interdependent parts of one transactional process. The focus of the study is on the process of interaction between the two. The main theme of this approach is the indivisibility of subject and object in the research exercise.

The term transaction seems to have been introduced by Dewey and Bentley (1949) and is reflected in the work of Ames (1955), Cantril (1950), Kilpatrick (1961), Ittelson (1961) and Altman and Stokols (1987).

The transactionalists like the constructivists believe that the outcome of the perceptual process is a phenomic or psychological environment. According to them, the person has autonomy or freewill in choosing among the stimuli available in producing a perceptual image. In addition, the major driving force in the process is the function it serves.

“Perception is of fundamental probabilities, of constructs which emerge from the consequences of past action and serve as directives for furthering the purposes of the organism through action” (Kilpatrick, 1961, p.4).

In terms of environmental perception the evidence presented leads to the following conclusions:

1. The environment provides information (affordances) which are necessary and important in the perceptual process.
2. The environment shapes our perceptual processes by determining the content of our perceptual memory, in the developmental process.
3. The person selects, interprets, and gives meaning to the information received and constructs a phenomic environment which then overrides the objective environment in determining behaviour.

Because of the overriding role of the phenomic environment, each of us will see the environment we look at in different ways. For example, a developer, a farmer, and a tourist looking the same piece of countryside will have quite different perceptions of it. Though they receive much the same physical stimuli, the tourist might have an overall view of a “pretty

scene”, the farmer may see the fields in terms of current crops, and the developer may superimpose a new bypass or superstore complex.

The different ways in which we appraise the environment influences our attitudes towards it. Attitudes to the environment are important for two reasons. First, they influence our likes and dislikes; and second, they are related to how we use and abuse our environment.

### **Environmental appreciation**

Kaplan and Kaplan (1982) conducted researches into the factors that influence our likes and dislikes and hence preferences for different types of environment. David Cantor (1968, 1969, 1983) demonstrates the ways in which our evaluation of the environment and meaning we give to it influence our behaviour in that environment and this can be applied in the planning of physical environments such as new housing projects (Cantor & Thorne, 1972).

Individual differences exist in preferences for different environments. Some people prefer beach holidays; some prefer to get away from the beaten track. Now the question is why such preferences occur. Kaplan and Kaplan (1978) and Kaplan (1973, 1975, 1979, 1987) have linked environmental cognition with environmental evaluation. The person-environment process is thought of as an interactional or transactional one. We react emotionally in different ways to different environments, but our feeling about our world is also coloured by our previous experiences. For example, professional training engenders different world views. Architects see form and light where most of us see buildings, and developers see buildings where most of us see valleys and hills.

The real world of our experience is more a subjective than an objective reality. However, to ignore aspects of the environment would lead to an incomplete picture. Four aspects of environments which are important in relation to our emotional response are coherence, legibility, complexity and mystery (Kaplan and Kaplan, 1978). *Coherence* refers to the organisation of parts and how well the whole fits together, and will be closely related to *legibility*, which reflects how easily the observer can “read” the environment, i.e., how they can process the information available and understand what they see. *Complexity* and *mystery* are the elements which attract attention and hold our interest with more complex environments. Another important aspect is the novelty of environment. *Novelty* attracts attention and arouses interest. These different dimensions of the environment operate on the individual through the interaction of physiological and psychological processes. Aspects of

the environment which instigate physiological arousal generate an emotional or affective response. Cognitive processes intercede between external events, biological responses and the emotion experienced. An optimum level of environmental elements produces satisfaction and appreciation in the person – a “*happy medium*” rule. A highly coherent, easily legible, simple, well known environment will be dissatisfying, as will be an environment which lacks coherence, is confusing, overly complex, mysterious and strange. The optimum level of arousal and information load is determined by the person’s previous experience. One person may like cities because they contain high levels of novelty, mystery and complexity, another may dislike cities for exactly the same reasons.