

autobiography. As the stream of scholarly discussion of self and consciousness gained momentum through the 1980s such issues rightly remained of central concern.

The process of preparing this volume for publication, also, unfortunately, ran through the 1980s -- for reasons now as irrelevant as they are irredeemable, but assuredly not to do with the contributors themselves. To them, and especially the publishers, we offer our appreciation for forbearance well beyond the call. Delays notwithstanding, we offer the original creative perspectives of the Houston Symposiasts -- supplemented, in a few instances, by a "Retrospective Preface" -- partly because of the perennial quality of the issues involved and partly because the insightful and important qualities of the essays remain essentially intact. As a consequence they will, we believe, yet enrich efforts -- in the 1990s and beyond -- to systematically illuminate the defining qualities of human experience and conduct. Bernard J. Baars' graciously provided foreword serves to suggest how these contributions can be constructively placed in the context of contemporary scholarship.

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1 The Development of Consciousness and the Acquisition of Skill

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Author's Retrospective Preface

This chapter presents an early version of a theory that has more recently undergone changes of both substance and emphasis. Because the focus of the Houston Symposium was explicitly on consciousness, it provided a unique opportunity to determine whether my own ecological approach to cognition could be reconciled with something like a phenomenological analysis of conscious experience. As will appear below, the result of this attempt was the discovery that self-relevant experience falls rather naturally into three distinct categories. In the present chapter, they are called the "ecological self," the "extended self," and the "evaluated self" respectively. Each "self" has its own characteristic course of development, and the argument as a whole has a strongly developmental flavor. Partly for that reason, these three categories also fit certain aspects of the acquisition of skill - a topic in which I have long been interested (Neisser, 1983, 1985).

Three years later, I returned to the same set of problems from a slightly different point of view. Further reflection had suggested that conscious experience per se may not be the most effective way to approach the problem of the self; the concept of available information provides a more appropriate starting point for development and ecological analysis. A preliminary theory based on this insight appears in a recent paper called "Five Kinds of Self-Knowledge" (Neisser, 1988). In that paper, categories of the self are explicitly defined by the kinds of information on which they are based. Despite this difference, the two theories still have a great deal in common. The 1988 version, like the one described here, begins with the notion of a directly perceived

"ecological self." The two theories also share the concept of an "extended self" that transcends the present, though they define it somewhat differently. However, they do *not* share the category that is here called the "evaluated self." In the later paper, that concept gives way to no less than three new "selves": An "interpersonal self" that arises from immediate social interaction, a "private self" based on introspective experience, and a "conceptual self" derived from language and culture. This added complexity may be unfortunate, but - in my view - no simpler system can do justice to the rich variety of self-relevant information that becomes available over the course of a human life. But whatever their merits, these later theoretical elaborations do not invalidate the argument of the present chapter. It stands on its own as an ecologically-oriented account of the development of consciousness itself, and of the relation between aspects of consciousness and the acquisition of skill.

This chapter is based on the assumption that consciousness can best be understood from a developmental perspective. The greater part of my argument will concern the changes in consciousness and self-awareness that occur during infancy and childhood. Recent research has forced us to abandon some long-held views. The baby's world is not a "blooming, buzzing confusion," as William James believed; infants perceive their environments realistically from the first. How does consciousness develop from that point forward? I will suggest three principal trends in development: First, there is an increase in the richness and detail of objective awareness. Because that awareness includes the perceiver as well as the surrounding environment, it results in the formation of what I will call an *ecological self*. Second, the increasing flexibility of anticipation and memory enable the infant to imagine situations other than those that presently exist, and to develop an imagined, *extended self*. Third, the cumulative result of social perception and interpersonal communication is the development of an emotional self-consciousness, and the consequent formation of an *evaluated self*.

Growing up is not the only kind of cognitive change. Further development occurs whenever an individual masters some new domain of knowledge or acquires a new skill. These achievements, too, are accompanied by changes in consciousness. In the last section of this chapter, I will try to relate them to the forms of development described earlier. I will suggest that mastery of a skill extends two of the basic developmental trends: The expert has an even wider awareness of the

actual and the possible than the novice. The third trend does not continue in the same way, however, and may even be reversed: Evaluative self-consciousness is generally incompatible with skilled performance, and can be expected to diminish with increasing expertise.

Objective Awareness and the Ecological Self

Infants are capable of veridical perception from the very beginnings of their lives. What they perceive is the objective world around them--the same world we see--and their own positions and actions in that world. Before I elaborate on these ideas, I must clarify the notion of "perception" itself. My usage follows that of James J. Gibson (1966, 1979), whose ideas are central to this part of the argument. To perceive is to pick up information about the objectively existing situation. That information is available to us because our sensory systems are attuned to certain types of structure. In particular, visual perception is based on optical structure. The perceiver, whose eye is either at rest or moving through the environment, may be thought of as sampling from an array of optical information. The array itself would exist whether anyone was sampling from it or not. Its structure corresponds in precise but complex ways to real properties of the environment. The layout of surfaces, the trajectories of object motions, and sometimes even the compositions of the objects themselves are specified in the light. (Many aspects of the environment are also given in the acoustic array and in the haptic structures available to touch. The present discussion is restricted to vision for the sake of simplicity.) Perspective gradients and texture gradients in the array specify surfaces at various orientations, for example. Occlusion of the texture of one surface by that of another specifies that the former has gone behind the latter; rapid symmetrical magnification of a texture, called "looming," occurs when an object approaches the point of observation. Not everything that is specified will be seen: The optic array is infinitely rich in information, and no one uses all of it. Seeing does not depend on a preliminary inventory of isolated sensations, to be later assembled and understood: The visual system has evolved to pick up information directly from optical structure.

What aspects of the world can be perceived? The examples above--the placement and slant of surfaces, the fact that one object lies behind another or that an object is approaching the perceiver--all concern what Gibson called the "layout" of the environment, the arrangement of the furniture of the local world. That is the traditional subject matter of the

study of perception, but it does not exhaust what is specified in the light. One can also see a good deal about *oneself*. One's own hand and feet, for example: The optic array specifies them as things that move in certain ways and make contact with nearby surfaces. The perceiver's position in the environment and the course of his or her movements are also visible; they are specified by flow patterns in the optic array. We can see whether we are moving, and where we are going. Gibson called this "visual kinesthesia" (1979, p. 126). Rapid expansion of the entire optic array indicates that we are moving toward a surface; lateral flow specifies movement parallel to a wall. Experiments have demonstrated that both adults and children use visual kinesthesia to maintain their posture and orientation (Lee & Aronson, 1974; Lee & Thomson, 1982).

Besides seeing where we are, we can see what we are doing. The optical consequences of our own actions, often called "reafference" or "feedback," provide critical information. What we do has visible effects. And even before we see what we are doing, we see what we *might* do. The furniture of the world around us makes certain actions possible; it affords those actions, as Gibson puts it. Floors afford walking, small objects afford grasping. (Affordances are different for different species; ceilings afford walking for a fly, but I am only considering human perception here.) Affordances can be perceived. The walk-on-ability of the floor is specified in the light just as completely as its position or its slant. The pass-through-ability of an open door is specified, too; seeing the vista beyond, we perceived the door as an opening through which we could pass. An affordance is a kind of meaning. To the extent that the meaning of an object or event consists in what we can do to it—or what it can do to us—many meanings are directly specified in the optic array. The environment we perceive is rich in immediate possibilities.

I suggest that we are *conscious* of all this; it is a constant, overt, describable aspect of our experience. We are aware of the local environment and its affordances, and of our own situation in that environment. This kind of consciousness may be called "objective awareness." It includes a certain definite awareness of our own selves, more specifically, of what may be called our "ecological selves." The ecological self is to be distinguished from the "extended" and "evaluated" selves to be considered later. It is immediately given; we see the positions and motions of our ecological selves as directly as we see the layout of the environment around us.

How much of all this does an infant perceive? Surely less than an adult. We know that the acquisition of perceptual skill takes time, and the infant has not had much time yet. It is unlikely that four-month-olds notice all the things that we do or are as precisely aware of their own positions and movements. Nevertheless they see a great deal. Here are some examples from modern studies of perceptual development:

(1) **Looming.** The expanding optical flow field that specifies the approach of an object is taken by infants to mean just that; they move their heads back as the object comes closer. They do not respond in this way to all types of optical expansion patterns, only to those that specify approaching surfaces. Eleanor Gibson and John Carroll (Gibson, 1982) have shown that the approach of an aperture (an opening in a surface) does not elicit the same response. Apertures afford exploration, not collision.

(2) **Reaching.** An infant who is interested in a sideways-moving object may put out his hand to catch it. Claes von Hofsten (1983) has shown that these reaches are anticipatory—they are directed to a part of the trajectory that the object has not yet reached. They are often successful, so the infant must have perceived the direction and velocity of the object's motion correctly.

(3) **Amodal structure.** Many experiments have confirmed a phenomenon first demonstrated by Elizabeth Spelke (1976). A four-month-old who is shown two movies side-by-side, while the soundtrack of one of them is played through a central loudspeaker, will look mostly at the movie corresponding to the soundtrack. (Of course the filmed events have to be things that interest babies, like banging toys or clapping hands.) To accomplish this, the infant must have picked up some kind of information structure common to both the visual and the auditory stimulation. Such a structure is necessarily "amodal"; it does not belong to any single sense modality. There are many examples of amodal structures; recent studies have shown that rate of change, rhythm, synchrony, and abruptness are all perceivable by babies. Nor are vision and hearing the only relevant sensory systems; Gibson and Walker (1984) have shown that *touch* and vision share amodal structures which are detectable by infants only one month old.

(4) **Selective attention.** Bahrick, Walker and I (1981) have used a similar technique to show that four-month-olds who are attentively

following one particular event will ignore another that is equally visible and optically superimposed on the first. If they encounter the ignored one later, they act as if they had never seen it before.

Given these and many other similar findings, it is highly plausible that infants live in a phenomenal world much like our own. They too have objective awareness. As they grow older that awareness deepens; they discover more about the environment and more about themselves. Further, they discover the effectiveness of their own actions, and attribute those actions to the ecologically perceptible self. All this happens continuously, because the ecological self is continuously specified in the light. And after a while, the characteristics of the self and the environment become familiar, so familiar that they are no longer discovered but merely confirmed. That development introduces the next part of my argument: If something is confirmed, it must first have been anticipated; if it was anticipated, some mental structure corresponding to it must have existed in advance. In almost all modern cognitive theories, such structures are called "schemata."

Schemata and the Self Extended in Time

Objective awareness deals with the present environment and the real possibilities that it affords. But human beings are not concerned only with the present; they also remember the past, prepare for the future, and imagine possibilities that may never be realized. I suggest that this extension of consciousness is based on many of the processes that underlie perception itself, used in a different and constructive way. Elsewhere (Neisser, 1976) I have described those processes as "anticipatory." Just as it takes a suitably tuned receiver to pick up radio signals, so there must be a suitably prepared nervous system to pick up information from the light. In this context the phrase "suitably prepared" can mean two different things. First, the evolution of homo sapiens has "prepared" us to extract information from the optic array. That is, we are born with schemata that enable us to see the kinds of things that there are in the world. In this sense, "prepared" and "anticipatory" are simply synonyms for "tuned" or "adapted."

A different meaning of "prepared" may be more important. Over and above its general tuning to optical information, the visual system is almost always in some *particular* state of anticipation. The information picked up a moment ago sets up a schematic readiness for what might be

available next; when that has been picked up in turn, the schema is modified and a new readiness is established. Perceiving is a cyclic activity; it does not take place in an instant, but over time. In ordinary perception, the schemata change so smoothly and play their parts so effectively that we are not aware of them. Sometimes, however, the anticipated information does not appear; a schema has been deployed, but the information to which it is tuned is not present. When that happens, we are in a special state of readiness, a condition that psychologists used to call "perceptual set" and nowadays refer to as "priming." The fact that a set can be established by instruction alone shows that schematic readinesses can be detached from the perceptual cycle and occur by themselves. Our conscious experience on such an occasion is somewhat paradoxical. In many ways it resembles what happens when we actually see an object: The same schema is in operation. But the information for which the schema is prepared does not materialize, so we actually see nothing. There is a common word for this odd state of mind: We are *imagining* the object. Images—at least some kinds of images—can thus be thought of as unfulfilled perceptual anticipations (Neisser, 1978).

Perception is not the only cyclic activity. Action itself—reaching, running, grasping, caressing—has the same structure. It is commonplace to note that actions are organized by purpose and governed by feedback. At every point in a movement we anticipate what we will see and feel next, as well as what we will do next. A moment later we will modify the action schema again, in anticipation of the movement after that. These schemata, too, are detachable; an imagined action is also a kind of anticipation. We can be ready to do something without yet having done it, just as we can be ready to see something without yet having seen it. We can manipulate this kind of image freely, even when we know perfectly well that the anticipated event will not really take place. I believe that the images so widely studied by cognitive psychologists—the ones used as mnemonic devices, the ones that seem to turn at fixed rates in experiments on mental rotation—are essentially the anticipatory phases of perceptual and action cycles. (In terms of the distinction presented in Kerr and Neisser, 1983, perceptual anticipations are "spatial knowing," not "mental seeing.")

Whatever its origin, there is no doubt that imagination plays a key role in development. The infant who starts out by living only in the present soon begins to master the past and future as well. From

anticipating what will happen next the child goes on to remembering what has happened already, and then to imagining what may not happen at all. Much of this imagining takes conventional forms. Katherine Nelson and her collaborators (Nelson & Ross, 1980; Nelson & Gruendel, 1981) have shown that children have the "scripts" for familiar occasions very early—they soon learn what happens when a person goes to the store or has dinner or goes to bed. They rehearse these scripts mentally, use them in fantasy and play, and can report them to an experimenter. Although we know about this imaginative activity mostly because of what children say about it, scripts need not be linguistic. Language helps them along as it contributes to many cognitive activities, but it would be a mistake to treat all development as based on verbal processes. (The ecological self, for example, probably owes little to language.) Linguistic and nonlinguistic forms of cognition are mutually supportive. Linguistic events can be anticipated and imagined, and they sustain and amplify our ability to imagine anything else.

In imaging what may happen and recalling what has happened, we leave the realm of objective awareness. Our consciousness extends to the possible as well as the actual; we can anticipate what we would see in entirely imaginary environments. Our conception of ourselves is altered, too. Who am *I*, in that imagined place? I still have a kind of ecological self, but it is not *this self here*. The extended awareness of imagination requires an analogously extended ecological self. It is as that extended self that I now recall my arrival in Houston for the conference on Self and Consciousness, or imagine returning to Houston at some future date. I can consider any number of scenarios in this way: Maybe aliens from Alpha Centauri will take me to Houston in a flying saucer next time. If the aliens turn out to be something like ET, and their saucer something like a round supercharged Buick, that's because I'm just rearranging schemata that I already have. Perceptual imagination—the use of the perceptual systems in the absence of what Piaget used to call their "aliment"—does not introduce any genuinely new elements into awareness. The next aspect of consciousness to be considered, however, has entirely different roots.

The Evaluated Self

So far I have described the development of consciousness as if it were a rather cool and dispassionate affair. Babies perceive their environments realistically from the first; they soon become aware of

themselves as ecological selves located in that environment; later they can imagine being in other places, too. Perhaps so, but these achievements do not yet reach the kinds of consciousness in which most people are interested. Our awareness of people and objects and especially of ourselves is usually tinged with *feeling*. We like and dislike, love and hate, trust and mistrust; we are happy or sad or indifferent. How do these forms of consciousness develop?

Everyone knows that babies are emotional. Their moods are plainly visible; they fuss and cry or beam with contentment from the day they are born. Freud assumed that the infant's mental life was entirely dominated by emotion and desire by the "pleasure principle." The opposing "reality principle" was said to emerge only slowly, after an initial stage in which the baby knows so little of the world around him that he hallucinates freely. Although this view of infancy was plausible at one time, we now know that it cannot be right. A wide range of experiments, including those mentioned earlier, have shown that even the youngest infants take an interest in their environments and are quite capable of perceiving them. What Freud called the reality principle is actually present from birth. Nevertheless, the pleasure principle can hardly be ignored; even the most carefully planned infant experiment has to wait if the baby starts to cry!

Goal-directed behavior appears very early. The infant wants the bottle, it wants its mother, it wants the shiny toy dangling just beyond arm's length. Babies reach for such things when they can reach, crawl toward them when they can crawl, run to them when they can run. Psychological theorists, like parents, typically ascribe such behaviors to hypothetical internal states: The baby is said to be hungry, or frightened, or curious. The baby itself must experience the situation differently. From its point of view, I think, the important thing is not the motive but the goal-object itself and its affordances. A perceived possibility soon creates a motivational state. Affordances become "valences," in Lewin's sense, so that the object is perceived as intrinsically attractive or repulsive. Probably the infant is not nearly as aware of his hunger as of the fact that the bottle is intensely desirable. The subjective aspects of hunger are vague and ill-defined, after all, while the bottle is very present and visible. On this hypothesis the infant has motives *without knowing that he has them*; without even knowing that he is the kind of entity to which motives belong.

The position of the self is specified in the light, but the covetousness of the self is not. The ecological self does not have a motivational dimension. Babies know what they want, but they do not know who wants it. Even when the ecological self is relevant to the infant's intended goal when she wants to be near her mother, for example she probably does not attribute the wanting itself to the small child whose spatial position matters so much. This may be what psychoanalysts mean when they say that the baby "has no sense of self" or "cannot separate itself from its mother." It has an ecological self but not an emotionally identified self. Indeed, the correct assignment of motives and feelings is no small matter. We make mistakes about it even as adults. Many people do not realize the extent to which their moral and aesthetic judgments reflect their own personal feelings.

So far I have only considered cases of the infant's goal-directed behavior, in which motivation and emotion are organizing forces. Something is perceived as desirable, and behavior is appropriately directed toward it. Feelings can also have the opposite effect; they may become so strong that they disrupt behavior entirely. The baby may cry and moan and be convulsed with affect, so that no organized activity is possible at all. Despite the strength of such outbursts, I doubt that they are experienced as related to the ecological self. How could they be? They are not perceivable: They have no tangible properties and occupy no position. They are not specified in the light. The baby's parents know perfectly well whose stomach is hurting, but the baby itself has no such idea. It probably has few ideas of any kind; normal information pickup is interrupted during such an outburst. There is pain, but it is not attributed to its actual source.

If the only conscious consequences of emotion were the valences perceived in objects and the disruptions produced by strong feelings, human self-understanding would be sharply limited. We would be incapable of self-evaluation and self-judgment, unable to understand the reasons for our own actions. But another factor has to be considered, one that is fundamental to social life. Emotions generally are public events. We signal our feelings to other members of our species by our behavior. We smile and frown, move softly or rigidly, approach or retreat, open our arms in an embrace or clench our hands into fists. Seeing these behaviors, another person watching us can see how we feel and what we intend to do. There is nothing surprising about this; other animals have similar communication systems. The archives of ethology

are packed with examples of the signals that animals make to their conspecifics signals that regulate social behavior effectively and innately. In fact, our own mannerisms of threat and compliance are not very different from those of our nearest relatives. Human hugs and smiles and threats and coverings are much like the signals of other primates. It is reasonable to assume, then, that we are born able to see the intentions of other people. Although this kind of information is not governed by the principles of optics in the same way as information about layouts and physical affordances, evolution has so arranged things that it is consistently available and generally trustworthy.

This argument is hardly new. Nowadays everyone has heard of "nonverbal communication," and nearly everyone is willing to attribute it to infants as well as to their caretakers. Indeed, the concept has been so widely accepted that it is often abused. Sometimes brief nonverbal exchanges are credited with magically powerful consequences for emotional development, as when a lifelong relationship is assumed to be established in a mother's first encounter with her baby. I find such claims implausible. Nevertheless, the perception of intentions may play an important role in the development of self-consciousness over the course of infancy and early childhood. In fact, at least three such roles are probably significant: First, because much behavior by other people is directed toward the perceiver's own ecological self, that self acquires the characteristics of an emotional target. Second, because the child can see that other people have feelings, he begins to realize that he may have feelings, too. Third, because his caretakers see and interpret his own emotional signals, he acquires a vocabulary with which to describe how he feels.

The first of these phenomena is particularly important for the development of self-evaluation. What people communicate nonverbally is not just their emotions but their intentions, and often their intentions toward the perceiver. The infant sees not only that his mother is loving but that she loves something in particular—and that something is his own ecological self. He sees it in her face and her movements, hears it in her voice, feels it in her touch. Alternately, she may be angry. He can see not only her anger, but that she is angry with somebody in particular; again, it is himself. (It has often been observed that young children have a hard time *imagining* the feelings of other people, but *seeing* those feelings is not difficult.) The targets of intention are easily visible, especially if one is an organism prepared for such communications. Thus

the ecological self begins to acquire a new kind of characteristic; it is perceived as a target for the feelings and actions of other individuals.

This probably happens early in life. The direction of people's actions is not hard to see, and there is every reason to believe that young infants are sensitive to emotional signals. As soon as imagination appears, as soon as the child becomes able to think of the past and future and the possible, another step can take place. He can now imagine emotional target experiences without actually having them, think about being loved or being punished when in fact he is alone. The imagined self becomes not only a physical person but a moral one, who has been (and might again be) the target of someone else's passion. The evaluated self has been born. Like other selves, it comes into existence as a result of perceptual experience. In this case, however, the critical information does not specify the layout of the environment and is not governed by ecological optics. It indicates the perceived intentions of other people, and does so reliably because of the evolutionary history of the species.

The second cognitive consequence of perceiving intentions has less to do with self-evaluation than with self-knowledge. I have suggested that while babies do not think of themselves as having emotions, the feelings of other people are plainly visible to them. The developing child may eventually hit on a happy analogy: If other selves have emotions, maybe she does too! This feeling she is experiencing is "anger," like the anger she often sees on other people's faces; this other feeling may be "love." If such insights occur, they would reverse the classical principle of "empathy," which maintains that we attribute feelings to other people only by analogy with our own conscious experience. Perhaps, on the contrary, we attribute feelings to ourselves by analogy with the perceptible feelings of other people. (This view is obviously related to the theory of self-perception proposed by Bem, 1967.) I do not mean that we would have no feelings without such an analogy, but that we would not know what they were, would not know they were in us. Early in development the child is full of passions without realizing that she is a passionate person; her experience is rich in desirable objects but she does not know that the desire for them is her own. She does not connect the emotions in her life with her own ecological self. In a word, her emotions are *unconscious*. They become conscious, in part, by observations of others. Freud was entirely correct in maintaining that feelings can be unconscious; indeed, it may be his greatest discovery. But they may not be unconscious because they have been *repressed* (in the

young child); rather, they are unconscious because they have never been properly attributed.

The third way in which the perceptibility of emotions affects the development of consciousness appears when they are given labels. Culture provides names for feelings, increasing the likelihood that we will recognize them in our own experience. We may be mistaken, of course (what I think of as resignation may really be anger), but the significance of emotional labelling is beyond question. Sometimes the labelling occurs in response to our own emotional behavior. Not only does the child see the behavior of his caretakers, but they see his behavior too. He is signalling his affection or his anger or his pain, and they are aware of it. (Notice that the child can signal his emotions without knowing that he has them. Nonverbal behavior is not produced because someone thinks "Oh, I am angry, I had better display my anger," it requires no conscious mediation.) Being aware of the child's signalled state, the caretakers may describe it to him: "Don't get so mad!", they say. This kind of verbal exchange provides the child with labels for his feelings, increasing his ability to describe them to himself and to others. Not all parents do this, of course, and it is not obvious how much of it is appropriate; self-consciousness is not an unmixed blessing.

The upshot of all three mechanisms--perceiving that one is the target of another person's emotion, seeing what other people are like and making the analogy to oneself, acquiring a vocabulary to label one's feelings--is that we become increasingly aware of the moral and emotional dimensions of our personal selves. Eventually we can all make some sort of response to questions like "How do you feel?"; perhaps even to "What kind of person are you?"

Extensions into Adulthood

Although I have illustrated these arguments with examples from early experience, the same developments continue throughout life. This is not the place to develop a general theory of self-appraisal, but a few points are worth mentioning. The self-evaluations of adults are not immune to change; they are most often changed by encounters with other people. There is at least one common situation in which one person tells another what feeling he is probably experiencing and draws analogies between his emotions and those of other people. That situation is psychotherapy. An explicit goal of most psychotherapies is to make the client aware of

feelings that he did not know he had. Psychotherapeutic experience provides additional support for the hypothesis that self-perception depends on other-perception in the realm of the emotions. The client already knows that other people have those feelings; he just has not attributed them to his own ecological self. Another traditional function of psychotherapy is to question the client's self-evaluation, reviewing the emotional target-experiences that gave rise to it and reconsidering their appropriateness. In short, it is often the business of psychotherapy to change consciousness. Similar changes in consciousness may take place in the political arena; some modern political movements aim explicitly at "consciousness-raising." All these interventions are aimed at the evaluated rather than at the ecological self. And while distortions of objective awareness can also occur, they represent deeper forms of pathology.

Examples such as psychotherapy and political awareness show that self-consciousness can change throughout life. Development is not something that happens only to children; it takes place whenever there is an opportunity for systematic learning about a structured domain. So far I have illustrated this principle only with "psychodynamic" examples, but it applies equally to objective awareness and the ecological self. They too can change, not usually reversing what came before but becoming richer and more detailed. Such changes occur as the natural byproducts of acquiring any skill.

"Skill" is a surprisingly flexible word, covering activities from chess to tennis, public speaking to playing the piano, driving a car to proving a theorem. Recently there has been an upsurge of psychological interest in these achievements, including both so-called "motor skills" (e.g., Kelso, 1982) and "cognitive skills" (Anderson, 1981). There have also been attempts to describe the development of skills outside the laboratory (e.g., Sudnow's account of learning to play jazz piano, 1981). I believe that all these forms of skill have at least two points in common. (For a more detailed analysis, see Neisser, 1983). First, all skilled action takes place with respect to a *medium*. Tennis balls and cars and pianos are real objects, and their physical properties cannot be ignored by anyone who manipulates them. While words and numbers are not objects in the same sense, they also belong to tightly structured domains, domains which, defined by the principles of linguistics or mathematics, function as abstract mediums of skill. Their properties constrain skilled behavior just as the properties of a physical medium do. We cannot play tennis without adapting to the properties of rackets and balls and tennis courts,

and we cannot talk sense without taking account of the structure of the language we use. Second, all skill involves *activity over time*. Many things must be coordinated at each moment, in a structure that takes account of the last moment and looks ahead to the next. The beginning of a stroke in tennis must be shaped in anticipation of the follow-through, and the beginning of a sentence by anticipation of the end. Thus the acquisition of skill is characterized both by increased knowledge of a medium and by improved temporal coordination.

It is hardly controversial to suggest that experts know more about their medium than novices do, or are better able to coordinate their actions. In terms of the analysis presented here, however, such differences imply a corresponding difference in consciousness. It seems to me that two of the three developmental trends described earlier--objective and extended awareness--are also characteristic of the acquisition of expertise. The more skillful one becomes, the more one notices about the situation and the better one can perform. David Sudnow puts it this way:

Only after years of play do beginners attain that sort of full-fledged competence at place finding that the jazz pianist's left hand displays in chord execution. Reaching the point where, with eyes closed, I can sit down at the piano, gain an initial orientation with the merest touch "anywhere" on the field, then reach out and bring my finger precisely into a spot "two feet" off to my left, where a half inch off is a mistake, come back up "seventeen inches" and hit another one, and go down "twenty-three inches" and get there at a fast clip -- a range of skills any competent player has -- took a long course of gradual incorporation. (1981, p. 13)

Having become expert, Sudnow is exquisitely conscious of the positions and ranges of his hands on the keyboard. His objective awareness of the environment has been enriched, his ecological self more precisely specified. The changes are qualitative as well as quantitative. He has learned to know the places on the keyboard in a new way, so intimately related to his musical intentions that he no longer thinks of them as "places" at all. Sudnow puts expressions like "anywhere" and "two feet" in quotes, to remind the reader that they do not quite catch the quality of his thought. Such qualitative changes of awareness are typical of the acquisition of skill.

Not only does skill bring new awareness of what is happening at the moment, it also makes one more aware of what may happen next. To be

an expert is to be able to make plans, look ahead, organize one's behavior around relatively distant goals. It is because they know the possibilities and how to realize them that experts can accomplish their aims where others cannot. However, in claiming that he "knows" these things, I do not mean that the expert says them subvocally or could say them to anyone else. The forms of consciousness that are critical for skill are generally not verbal, unless the skill is actually a linguistic one. The expert's consciousness may even be *less* verbal than that of the novice, because training often begins with verbal instructions that become irrelevant later on. This increasing freedom from linguistic control is one reason why practiced skills are sometimes said to become "automatic." But consciousness is not just linguistic, not just a matter of words. We are aware of much that we see or imagine or plan to do, quite independently of speech. The extended consciousness that comes with the acquisition of skill is not usually linguistic, but it is no less genuine on that account.

Here, too, my argument echoes what real experts say for themselves. The introspective description given by musicians and athletes and performers emphasize what they call *concentration*. To be really effective, they say, you must concentrate intently: Responding to subtle cues, keeping track of everything important, avoiding any train of thought that would interfere with maximum performance. Don't think in words. If you get it right, everything will happen of its own accord: You will be aware of everything in what seems to be a single coherent moment. You can't describe that moment in words, but it is not "outside of awareness;" on the contrary, awareness is essential for its appearance.

The experts say something else that is worth considering. Top performance demands not only full awareness of the situation, but minimum awareness of one's own ego. Self-consciousness is the greatest obstacle to excellence in skill. If you think about how you look, or what this will do for your reputation, or whether it is the right thing to do, you are finished. You have to forget yourself entirely and concentrate on the task at hand. Egotism may be a frequent companion of expertise, but it must be kept in its place. That place does not include the moment of performance. The expert in action must combine complete concentration with dispassionate objectivity. What matters is not what others may think, but what the situation is. In *Zen in the Art of Archery*, (Herrigel, 1953) the master insists that one should not be aware of any personal intention, not even of the intention to shoot. "It shoots." Thus while the

development of objective awareness and of imagination are just as essential to growing skillful as they are to growing up, this is not true of the development of self-evaluation: That trend must be reversed, or transcended, or at least sidestepped, if we are not to be distracted from our chosen tasks.

Overview

Consciousness, then, is neither a fixed mechanism nor a single quality of mind. I have tried to describe it as a composite of at least three qualities of experience, all of which undergo development. A major component of that development is toward a more adequate perception of reality. "Adequate" does not mean right as opposed to wrong—even neonates are not wrong about what they see—but rich as opposed to incomplete. Objective awareness increases as young children find out more about the world; it increases still more as we master some particular skill, exploring some corner of the world and its possibilities more thoroughly. To be complete, objective awareness must include what I have called the "ecological self." Because we really exist in a real environment, an adequate consciousness must include a correspondingly adequate self-consciousness. But the ecological and imagined selves must be distinguished from the egotistical consciousness of the evaluated self. That evaluated self is an indispensable part of human nature, too. The perception of other people's feelings, and the self-perception that follows from it, are the essence of our emotional lives. If, on occasion, the evaluated self gets in our way, causing anxiety or interfering with skillful performance, it also makes social life and personal relationships possible. No one would wish to be without it. At most, one might wish for a more accurate or objective self-conception than most of us achieve. When Burns wrote

Oh wad some power the giftie gie us
To see oursels as others see us!

he was not talking about the ecological self.

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2 The Role of the Self in Social Behavior

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Preface

This chapter represents our thinking as of 1982. Since that time, several papers on the role of self have been written and published (or are in press). For example, Lewis, Brooks-Gunn and Jaskir (1985) showed that insecure infants, as opposed to securely attached infants, show earlier self-recognition. Moreover, we have shown that self-development is related to the emergence of self-conscious emotions (Lewis, Sullivan, Stanger & Weiss, 1989). Lewis (in press) has discussed the role of self in feeling vs. thinking. We have also explored individual differences in self-conscious development and concluded that consciousness, as a specific example, emerges between 15 and 24 months of age, is maturationally derived (mental age related) and is influenced by the early parent-child relationship (Lewis, 1986).

These changes and the growth of the study of self-development by such investigators as Harter (1983), among others, add to the theme of this chapter. Nevertheless, what we have reported, the findings and theory, remain relatively robust.

Two general world views of human nature predominate in our theories of social development. In the first, the child is acted on by a variety of forces, and as such, this can be called the mechanistic view. In the second view, the child acts on these forces and it can be called the constructivist view (Lewis, 1979). The reactive or mechanistic view generates two major theoretical paradigms, the biological or maturational, and the social control. The active view, on the other hand, has generated the constructivist or development-cognitive theoretical paradigm.

In both the biological/maturational and social control paradigms, the causes of social behavior and development change are forces which act