The Origins of Cognitive Thought

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ABSTRACT: Words referring to feelings and states of mind were first used to describe behavior or the situations in which behavior occurred. When concurrent bodily states began to be noticed and talked about, the same words were used to describe them. They became the vocabulary of philosophy and then of mentalistic or cognitive psychology. The evidence is to be found in etymology. In this article, examples are given of words that have come to describe the feelings or states of mind that accompany doing, sensing, wanting, waiting, thinking, and several other attributes of mind. The bodily states felt or introspectively observed and described in these ways are the subject of physiology, especially brain science.

What is felt when one has a feeling is a condition of one's body, and the word used to describe it almost always comes from the word for a cause of the condition felt. The evidence is to be found in the history of the language—in the etymology of the words that refer to feelings (Skinner, 1987). Etymology is the archaeology of thought. The great authority in English is the *Oxford English Dictionary* (1928), but a smaller work such as Skeat's (1956) *Etymological Dictionary of the English Language* will usually suffice. We do not have all the facts we should like to have, because the earliest meanings of many words have been lost, but we have enough to make a plausible general case. To describe great pain, for example, we say *agony*. The word first meant struggling or wrestling, a familiar cause of great pain. When other things felt the same way, the same word was used.

A similar case is made here for the words we use to refer to states of mind or cognitive processes. They almost always began as references either to some aspect of behavior or to the setting in which the behavior occurred. Only very slowly have they become the vocabulary of something called mind. *Experience* is a good example. As Raymond Williams (1976) has pointed out, the word was not used to refer to anything felt or introspectively observed until the 19th century. Before that time, it meant, quite literally, something a person had "gone through" (from the Latin *expiriri*), or what we would now call an exposure to contingencies of reinforcement. In this article, I review about 80 other words for states of mind or cognitive processes. They are grouped according to the bodily conditions that prevail when individuals are doing things, sensing things, changing the way they do or sense things (learning), staying changed (remembering), wanting, waiting, thinking, and "using their minds."

Doing

The word *behave* is a latecomer. The older word was *do*. As the very long entry in the *Oxford English Dictionary* shows, the word *do* has always emphasized consequence—the effect one has on the world. We describe much of what we ourselves do with the words we use to describe what others do. When we are asked, "What did you do?", "What are you doing?", or "What are you going to do?" we say, for example, "I wrote a letter," "I am reading a good book," or "I shall watch television." But how can we describe what we feel or introspectively observe at the time?

There is often very little to observe. Behavior often seems spontaneous; it simply happens. We say it "occurs" as in "It occurred to me to go for a walk." We often replace "it" with "thought" or "idea" ("The thought—or idea—occurred to me to go for a walk"), but what, if anything, occurs is the walk. We also say that behavior comes into our possession. We announce the happy appearance of the solution to a problem by saying "I have it!"

We report an early stage of behaving when we say "I feel like going for a walk." That may mean "I feel as I have felt in the past when I have set out for a walk." What is felt may also include something of the present occasion, as if to say "Under these conditions I often go for a walk," or it may include some state of deprivation or aversive stimulation, as if to say "I need a breath of fresh air."

The bodily condition associated with a high probability that we shall do something is harder to pin down, and we resort to metaphor. Because things often fall in the direction in which they lean, we say we are *inclined* to do something, or have an *inclination* to do it. If we are strongly inclined, we may even say we are *bent* on doing it. Because things also often move in the direction in which they are pulled, we say that we *tend* to do things (from the Latin *tendere*, to stretch or extend) or that our behavior expresses an *intention*, a cognitive process widely favored by philosophers at the present time.

We also use *attitude* to refer to probability. An attitude is the *position*, *posture*, or *pose* we take when we are about to do something. The pose of an actress suggests something of what she is engaged in doing or is likely to do in a moment. The same sense of pose is found in *dispose* and *propose* ("I am disposed to go for a walk;" "I propose to go for a walk"). Originally a synonym of propose, the word *purpose* has caused a great deal of trouble. Like other words suggesting probable action, it seems to point to the future. The future cannot be acting

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now, however, and elsewhere in science purpose has given way to words referring to *past* consequences. When philosophers speak of intention, for example, they are almost always speaking of operant behavior.

As the experimental analysis has shown, behavior is shaped and maintained by its consequences, but only by consequences that lie in the past. We do what we do because of what *has* happened, not what *will* happen. Unfortunately, what has happened leaves few observable traces, and why we do what we do and how likely we are to do it are therefore largely beyond the reach of introspection. Perhaps that is why, as I will show later, behavior has so often been attributed to an initiating, originating, or creative act of will.

Sensing

In order to respond effectively to the world around us, we must see, hear, smell, taste, or feel it. The ways in which behavior is brought under control of stimuli can be analyzed without too much trouble, but what we observe when we see ourselves seeing something is the source of great misunderstanding. We say we *perceive* the world in the literal sense of taking it in (from the Latin *per* and *capere,* to take). (*Comprehend* is a close synonym, part of which comes from *prehendere,* to seize or grasp.) We say "I take your meaning." Because we cannot take in the world itself, it has been assumed that we must make a copy. Making a copy cannot be all there is to seeing, however, because we still have to see the copy. Copy theory involves an infinite regress. Some cognitive psychologists have tried to avoid it by saying that what is taken in is a representation—perhaps a digital rather than an analog copy. When we recall ("call up an image of") what we have seen, however, we see something that looks much like what we saw in the first place, and that would be an analog copy. Another way to avoid the regress is to say that at some point we "interpret" the copy or representation. The origins of *interpret* are obscure, but the word seems to have had some connection with price; an interpreter was once a broker. Interpret seems to have meant evaluate. It can best be understood as something we do.

The metaphor of copy theory has obvious sources. When things reinforce our looking at them, we continue to look. We keep a few such things near us so that we can look at them whenever we like. If we cannot keep the things themselves, we make copies of them, such as paintings or photographs. *Image,* a word for an internal copy, comes from the Latin *imago.* It first meant a colored bust, rather like a wax-work museum effigy. Later it meant ghost. *Effigy,* by the way, is well chosen as a word for a copy, because it first meant something constructed (from the Latin *fingere*). There is no evidence, however, that we construct anything when we see the world around us or when we see that we are seeing it.

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A behavioral account of sensing is simpler. Seeing is behaving and, like all behaving, is to be explained either by natural selection (many animals respond visually shortly after birth) or operant conditioning. We do not see the world by taking it in and processing it. The world takes control of behavior when either survival or reinforcement has been contingent on it. That can occur only when something is done about what is seen. Seeing is only part of behaving; it is behaving up to the point of action. Because behavior analysts deal only with complete instances of behavior, the sensing part is out of reach of their instruments and methods and must, as I will show later, be left to physiologists.

Changing and Staying Changed

Learning is not doing; it is changing what we do. We may see that behavior has changed, but we do not see the changing. We see reinforcing consequences but not how they effect a change. Because the observable effects of reinforcement are usually not immediate, we often overlook the connection. Behavior is then often said to grow or *develop.* Develop originally meant to unfold, as one unfolds a letter. We assume that what we see was there from the start. Like pre-Darwinian evolution (where to evolve meant to unroll as one unrolled a scroll), developmentalism is a form of creationism.

Copies or representations play an important part in cognitive theories of learning and memory, where they raise problems that do not arise in a behavioral analysis. When we must describe something that is no longer present, the traditional view is that we recall the copy we have stored. In a behavioral analysis, contingencies of reinforcement change the way we respond to stimuli. It is a changed person, not a memory, that has been "stored."

Storage and retrieval become much more complicated when we learn and recall how something is done. It is easy to make copies of things we see, but how can we make copies of the things we do? We can model behavior for someone to imitate, but a model cannot be stored. The traditional solution is to go digital. We say the organism learns and stores rules. When, for example, a hungry rat presses a lever and receives food and the rate of pressing immediately increases, cognitive psychologists want to say that the rat has learned a rule. It now knows and can remember that "pressing the lever produces food." But "pressing the lever produces food" is a description of the contingencies we have built into the apparatus. We have no reason to suppose that the rat formulates and stores such a description. The contingencies change the rat, which then survives as a changed rat. As members of a verbal species, we can describe contingencies of reinforcement, and we often do so because the descriptions have many practical uses (for example, we can memorize them and say them again whenever circumstances demand it), but there is no introspective or other evidence that we verbally describe every contingency that affects our behavior; indeed, there is much evidence to the contrary.

Some of the words we use to describe subsequent occurrences of behavior suggest storage. *Recall*—call back—is obviously one of them; *recollect* suggests "bringing together" stored pieces. Under the influence of the computer, cognitive psychologists have turned to *retrieve*—literally "to find again" (cf. the French *trouver*), presumably after a search. The etymology of *remember*, however, does not imply storage. From the Latin *memor*, it means to be "mindful of again," and that usually means to do again what we did before. To remember what something looks like is to do what we did when we saw it. We needed no copy then, and we need none now. (We *recognize* things in the sense of re-cognizing them—responding to them now as we did in the past.) As a thing, a memory must be something stored, but as an action "memorizing" simply means doing what we must do to ensure that we can behave again as we are behaving now.

Wanting

Many cognitive terms describe bodily states that arise when strong behavior cannot be executed because a necessary condition is lacking. The source of a general word for states of that kind is obvious: When something is wanting, we say we want it. In dictionary terms, to want is to "suffer from the want of." *Suffer* originally meant to undergo, but now it means to be in pain, and strong wanting can indeed be painful. We escape from it by doing anything that has been reinforced by the thing that is now wanting and wanted.

A near synonym of want is *need*. It, too, was first closely tied to suffering; to be in need was to be under restraint or duress. (Words tend to come into use when the conditions they describe are conspicuous.) *Felt* is often added: One has a *felt need*. We sometimes distinguish between want and need on the basis of the immediacy of the consequence. Thus, we *want* something to eat, but we *need* a taxi in order to do something that will have later consequences.

Wishing and *hoping* are also states of being unable to do something we are strongly inclined to do. The putted golf ball rolls across the green, but we can only *wish* or *will* it into the hole. (Wish is close to will. The Anglo-Saxon *willan* meant wish, and the *would* in "would that it were so" is almost the same as the past tense of will.)

When something we need is missing, we say we *miss* it. When we want something for a long time, we say we *long* for it. We long to see someone we love who has long been absent.

When past consequences have been aversive, we do not hope, wish, or long for them. Instead, we *worry* or feel *anxious* about them. Worry first meant choke (a dog worries the rat it has caught), and anxious comes from another word for choke. We cannot do anything about things that have already happened, though we are still affected by them. We say we are *sorry* for a mistake we have made. Sorry is a weak form of *sore*. As the slang expression has it, we may be "sore about something." We *resent* mistreatment, quite literally, by "feeling it again" (*resent* and *sentiment* share a root).

Sometimes we cannot act appropriately because we do not have the appropriate behavior. When we have lost our way, for example, we say we feel *lost*. To be *bewildered* is like being in a wilderness. In such a case, we *wander* (wend our way aimlessly) or *wonder* what to do. The wonders of the world were so unusual that no one responded to them in normal ways. We stand in *awe* of such things, and awe comes from a Greek word that meant *anguish* or *terror*. Anguish, like anxiety, once meant choked, and terror was a violent trembling. A *miracle*, from the Latin *admirare*, is something to be wondered at—or about.

Sometimes we cannot respond because we are taken unawares; we are *surprised* (the second syllable of which comes from the Latin *prehendere*, to seize or grasp). The story of Samuel Johnson's wife is a useful example. Finding Johnson kissing the maid, she is said to have exclaimed "I am surprised!"

"No," said the doctor, "*I* am surprised; *you* are astonished!" *Astonished*, like *astounded*, first meant to be alarmed by thunder. Compare the French *étonner* and *tonnere*.

When we cannot easily do something because our behavior has been mildly punished, we are *embarrassed* or barred. Conflicting responses find us *perplexed*: They are "interwoven" or "entangled." When a response has been inconsistently reinforced, we are *diffident*, in the sense of not trusting. Trust comes from a Teutonic root suggesting consolation, which in turn has a distant Greek relative meaning whole. Trust is bred by consistency.

Waiting

Wanting, wishing, worrying, resenting, and the like are often called "feelings." More likely to be called "states of mind" are the bodily conditions that result from certain special temporal arrangements of stimuli, responses, and reinforcers. The temporal arrangements are much easier to analyze than the states of mind that are said to result.

Watch is an example. It first meant "to be awake." The night watch was someone who stayed awake. The word *alert* comes from the Italian for a military watch. We watch television until we fall asleep.

Those who are awake may be *aware* of what they are doing; aware is close to *wary* or *cautious*. (Cautious comes from a word familiar to us in *caveat emptor*.) Psychologists have been especially interested in awareness, although they have generally used a synonym, *consciousness*.

One who watches may be waiting for something to happen, but *waiting* is more than watching. It is something we all do but may not think of as a state of mind. Consider waiting for a bus. Nothing we have ever done has made the bus arrive, but its arrival has reinforced many of the things we do while waiting. For example, we stand where we have most often stood and look in the direction in which we have most often looked when buses appeared. Seeing a bus has also been strongly reinforced, and we may see one while we are waiting, either in the sense of "thinking what one would look like" or by mistaking a truck for the bus.

Waiting for something to happen is also called *expecting,* a more prestigious cognitive term. To *expect* is to look forward to (from the Latin *expectare*). To anticipate is to do other things beforehand, such as getting the bus fare ready. Part of the word comes from the Latin *capere*—to take. Both expecting and anticipating are forms of behavior that have been adventitiously reinforced by the appearance of something. (Much of what we do when we are waiting is public. Others can see us standing at a bus stop and looking in the direction from which buses come. An observant person may even see us take a step forward when a truck comes into view or reach for a coin as the bus appears. We ourselves "see" something more, of course. The contingencies have worked private changes in us, to some of which we alone can respond.)

Thinking

It is widely believed that behavior analysts cannot deal with the cognitive processes called thinking. We often use *think* to refer to weak behavior. If we are not quite ready to say "He is wrong," we say "I think he is wrong." Think is often a weaker word for know; we say "I think this is the way to do it" when we are not quite ready to say "I know this is the way" or "This *is* the way." We also say *think* when stronger behavior is not feasible. Thus, we think of what something looks like when it is not there to see, and we think of doing something that we cannot at the moment do.

Many thought processes, however, have nothing to do with the distinction between weak and strong behavior or between private and public, overt and covert. To think is to do something that makes other behavior possible. Solving a problem is an example. A problem is a situation that does not evoke an effective response; we solve it by changing the situation until a response occurs. Telephoning a friend is a problem if we do not know the number, and we solve it by looking up the number. Etymologically, to *solve* is to loosen or set free, as sugar is *dissolved* in coffee. This is the sense in which thinking is responsible for doing. "It is how men think that determines how they act." Hence, the hegemony of mind. Again, however, the terms we use began as references to behavior. Here are a few examples.

1. When no effective stimulus is available, we sometimes *expose* one. We *discover* things by uncovering them. To *detect* a signal does not mean to respond to it; it means to remove something (the *tegmen*) that covers it.

2. When we cannot uncover a stimulus, we sometimes keep an accessible one in view until a response occurs. *Observe* and *regard* both come from words that meant to hold or keep in view, the latter from the French *garder. Consider* once meant to look steadily at the stars until something could be made of them (*consider* and *sidereal* have a common root). *Contemplate,* another word for think, once meant looking at a template or plan of the stars. (In those days all one could do to make sense of the stars was to look at them.)

3. We not only look at things in order to see them better, but we also *look for* them. We *search* or *explore.* To look for a pen is to do what one has done in the past when a pen came into view. (A pigeon that pecks a spot because doing so has been occasionally reinforced will "look for it" after it has been taken away by doing precisely what it did when the spot was there—moving its head in ways that brought the spot into view.) We search in order to find, and we do not avoid searching by *contriving* something to be seen, because contrive, like retrieve, is from the French *trouver,* to find.

4. We bring different things together to make a single response feasible when we *concentrate,* from an older word *concentre,* to join in a center.

5. We do the reverse when we separate things so that we can more easily deal with them in different ways. We *sift* them, as if we were putting them through a sieve. The *cern* in *discern* (Latin *cernere*) means to separate or set apart.

6. We *mark* things so that we will be more likely to notice them again. *Distinguish,* a good cognitive term, once meant to mark by pricking. Mark is strongly associated with boundaries; animals mark the edges of their territories.

7. To *define* is literally to mark the bounds or end (*finis*) of something. We also *determine* what a word means by indicating where the referent terminates.

8. We *compare* things, literally, by putting them side by side so that we can more easily see whether they match. The *par* in compare means equal. Par value is equal value. In golf, par is a score to be matched.

9. We *speculate* about things in the sense of looking at them from different angles, as in a *specula* or mirror.

10. *Cogitate,* an old word for think, first meant to "shake up." A *conjecture* is something "thrown out" for consideration. We *accept* or *reject* things that occur to us in the sense of taking or throwing them back, as if we were fishing.

11. Sometimes it helps to change one mode of stimulation into another. We do so when we convert the "heft" of an object into its weight, read on a scale. By weighing things we react more precisely to their weight. *Ponder, deliberate,* and *examine,* good cognitive processes, all once meant weigh. (*Ponder* is part of ponderous; the *liber* in deliberate is the Latin *libra,* a scales; and *examine* meant the tongue of a balance.)

12. We react more precisely to the number of things in a group by *counting.* One way to count is to recite *one, two, three,* and so on, while ticking off (touching) each item. Before people learned to count, they recorded the number of things in a group by letting a pebble stand for each thing. The pebbles were called *calculi* and their use *calculation.* There is a long, but unbroken, road from pebbles to silicon chips.

13. After we have thought for some time, we may reach a decision. To *decide* once meant simply to cut off or bring to an end.

14. A better word for decide is *conclude,* to close a discussion. What we conclude about something is our last word.

It is certainly no accident that so many of the terms

we now use to refer to cognitive processes once referred either to behavior or to the occasions when behavior occurs. It could be objected, of course, that what a word once meant is not what it means now. Surely there is a difference between weighing a sack of potatoes and weighing the evidence in a court of law. When we speak of weighing evidence, we are using a metaphor. But a metaphor is a word that is "carried over" from one referent to another on the basis of a common property. The common property in weighing is the conversion of one kind of thing (potatoes or evidence) into another (a number on a scale or a verdict). Once we have seen that done with potatoes, it is easier to see it done with evidence. Over the centuries human behavior has grown steadily more complex as it has come under the control of more complex environments. The number and complexity of the bodily conditions felt or introspectively observed have grown accordingly, and with them has grown the vocabulary of cognitive thinking.

We could also say that weight becomes abstract when we move from potatoes to evidence. The word is indeed abstracted in the sense of being drawn away from its original referent, but it continues to refer to a common property, and as in the case of metaphor, in a possibly more decisive way. The testimony in a trial is much more complex than a sack of potatoes, and "guilty" probably implies more than "10 pounds." But abstraction is not a matter of complexity. Quite the contrary. Weight is only one aspect of a potato, and guilt is only one aspect of a person. Weight is as abstract as guilt. It is only under verbal contingencies of reinforcement that we respond to single properties of a thing or person. In doing so, we abstract the property from the thing or person.

One may still argue that at some point the term is abstracted and carried over, not to a slightly more complex case, but to something of a very different kind. Potatoes are weighed in the physical world; evidence is weighed in the *mind*, or with the *help* of the mind, or *by* the mind. And that brings us to the heart of the matter.

Mind

The battle cry of the cognitive revolution is "Mind is back!" A "great new science of mind" is born. Behaviorism nearly destroyed our concern for it, but behaviorism has been overthrown, and we can take up again where the philosophers and early psychologists left off.

Extraordinary things have certainly been said about the mind. The finest achievements of the species have been attributed to it; it is said to work at miraculous speeds in miraculous ways. But what it is and what it does are still far from clear. We all speak of the mind with little or no hesitation, but we pause when asked for a definition. The dictionaries are of no help. To understand what "mind" means, we must first look up *perception, idea, feeling, intention,* and many of the other words we have just examined. We will find that each of them is defined with the help of the others. Perhaps it is of the very essence of mind that it cannot be defined. Nevertheless, we can see how the word is used and what people seem to be saying when they use it.

Mind is often spoken of as if it were a place. When it occurs to us to do something, we say that "it comes to mind." If we go on doing it, it is because we "keep it in mind." We miss an appointment when it "slips our mind." Mind is also spoken of as an organ. People "use their minds" to solve problems. It may be significant that we are more likely to say "Use your head" or "Use your brains" than "Use your mind," as if we felt the need for something more substantial. Mind also sometimes means "made more likely to act." An early use ("I was minded to go") still survives in the word *remind.* An appointment book reminds us of an appointment, and someone we meet reminds us of a friend if we respond to some extent as we respond to the friend.

Often, however, "mind" means little more than "do." "I have a mind to tell you" means "I am inclined to tell you." Those who "speak their mind" say what they have to say. We are cautioned to avoid falling by "minding the step" in the sense of noticing it. Students "mind their teachers" in the sense of obeying them, and teachers "mind their students" in the sense of watching them. "Do you mind my smoking?" means "Do you object?" In reply to "Will you have a drink?", "I don't mind if I do" means "I won't refuse if you offer me one."

The mind that the cognitive revolution has restored to prominence is also the doer of things. It is the executor of cognitive processes. It perceives the world, organizes sense data into meaningful wholes, and processes information. It is the double of the person whose mind it is, a replica, a surrogate, a *Doppelgänger.* Take any sentence in which the mind does something and see if the meaning is substantially changed if person is substituted. It is said, for example, that "the mind cannot comprehend infinity." Does that mean anything more than that no person can comprehend infinity? Cognitive processes are behavioral processes; they are things people do.

The crucial age-old mistake is the belief that they are something more, that what we feel as we behave is the cause of our behaving. From the time of the early Greeks, the search has been on for internal determiners. The heart, lungs, liver, kidneys, spleen, not to mention the humours, and at last the brain have all been promising candidates. As organs, they have had the advantage that they could be observed in a possibly more reliable way in dead bodies, but philosophers were soon contending that perceptions, feelings, intentions, and the like had an independent existence. Unfortunately, we cannot report any internal event, physical or metaphysical, accurately. The words we use we learned from people who did not know precisely what we were talking about, and we have no sensory nerves going to the parts of the brain in which the most important events presumably occur. Many cognitive psychologists recognize these limitations and dismiss the words we have been examining as the language of "common sense psychology." The mind that has made its comeback is therefore not the mind of Locke or Berkeley or Wundt or William James. We do not observe it;

we infer it. We do not see ourselves processing information, for example. We see the materials that we process and the product, but not the producing. We now treat mental processes, such as intelligence, personality, or character traits, as things no one ever claims to see through introspection. Whether or not the cognitive revolution has restored mind as the proper subject matter of psychology, it has not restored introspection as the proper way of looking at it. The behaviorists' attack on introspection has been devastating.

Cognitive psychologists have therefore turned to brain science and computer science for confirmation of their theories. Brain science, they say, will eventually tell us what cognitive processes really are. They will answer, once and for all, the old questions about monism, dualism, and interactionism. By building machines that do what people do, computer science will demonstrate how the mind works.

What is wrong with all of this is not what philosophers, psychologists, brain scientists, and computer scientists have found or will find; it is the direction in which they are looking. No account of what is happening inside the human body, no matter how complete, will explain the origins of human behavior. What happens inside the body is not a beginning. By looking at how a clock is built, we can explain why it keeps good time, but not why keeping time is important, or how the clock came to be built that way. We must ask the same questions about a person. Why do people do what they do, and why do the bodies that do it have the structures they have? We can trace a small part of human behavior, and a much larger part of the behavior of other species, to natural selection and the evolution of the species, but the greater part of human behavior must be traced to contingencies of reinforcement, especially to the very complex social contingencies we call cultures. Only when we take those histories into account can we explain why people behave as they do.

That position is sometimes characterized as treating a person as a black box and ignoring the contents. Behavior analysts would study the invention and uses of clocks without asking how clocks are built. But nothing is being ignored. Behavior analysts leave what is inside the black box to those who have the instruments and methods needed to study it properly. There are two unavoidable gaps in any behavioral account: one between the stimulating action of the environment and the response of the organism, and one between consequences and the resulting change in behavior. Only brain science can fill those gaps. In doing so it completes the account; it does not give a different account of the same thing. Human behavior will eventually be explained (as it can only be explained) by the cooperative action of ethology, brain science, and behavior analysis.

The analysis of behavior need not wait until brain scientists have done their part. The behavioral facts will not be changed, and they suffice for both a science and a technology. Brain scientists may discover other kinds of variables affecting behavior, but they will turn to a behavioral analysis for the clearest account of the effects of these variables.

Conclusion

Verbal contingencies of reinforcement explain why we report what we feel or introspectively observe. The verbal culture that arranges such contingencies would not have evolved if it had not been useful. Bodily conditions are not the causes of behavior, but they are collateral effects of the causes. People's answers to questions about how they feel or what they are thinking often tell us something about what has happened to them or what they have done. We can understand them better and are more likely to anticipate what they will do. The words they use are part of a living language that can be used without embarrassment by cognitive psychologists and behavior analysts alike in their daily lives.

But these words cannot be used in their science! A few traditional terms may survive in the technical language of a science, but they are carefully defined and stripped by usage of their old connotations. Science requires a language. We seem to be giving up the effort to explain our behavior by reporting what we feel or introspectively observe in our bodies, but we have only begun to construct a science needed to analyze the complex interactions between the environment and the body and the behavior to which it gives rise.

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