

Why Focus on Behavior

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A person might peruse my Instructional Systems website (<http://members.aol.com/JohnEshleman/index.html>) and wonder, “why all the emphasis on behavior?”

There does not appear to be any mention of cognitive processes, information, or the methods by which teaching is “normally” done on the site. One might well ask, why all the focus on behavior? Does that mean that the important cognitive processes can not or will not rate consideration? Does that mean that an instructional system built around behavior can not or will not handle cognition?

I think that a well-designed instructional system, and yes, one built around behavior, can and will address all of the cognitive process and informational issues—and then some. But, let us analyze the term “cognitive processes.” As I see it, the term “cognitive processes” usually refers either to a repertoire of behavior or to low-amplitude verbal behavior. In some cases, it might even refer to both a repertoire and low-amplitude verbal behavior. In other cases cognitive processes, if presented as explanations for behavior, could turn out to be explanatory fictions. I will deal with each of these possibilities.

Repertoires

A repertoire consists of a set of different behaviors. The set of behaviors has some overall purpose, function, or effect. The behaviors in the set may occur in a fixed sequence, a partially fixed sequence, or vary in no particular sequence. The behaviors may occur in a chain, be concurrent, or both. The sequence or chain may include repetitions of the same behavior. Each particular behavior “operates” on the person’s environment in some way.

Each particular behavior produces an effect. In some cases, the effect produced allows another behavior in the repertoire to occur.

To turn that statement around, some behaviors may require other behaviors to occur first.

Operating a motor vehicle represents an example of a repertoire. When you drive a car, for instance, driving refers to a set of related behaviors. The behaviors are related with respect to effective and successful operation of the

motor vehicle. The set includes starting the car, shifting gears, steering, watching out for traffic and other objects, braking, signaling, accelerating, putting on a seat belt, adjusting the mirrors, stopping the car, and so on. Some behaviors require a sequence. For instance, you must first turn on the ignition to start the car before you shift it into gear or steer it. Steering normally requires that the car engine be on, and the car be in motion.

Other repertoires work pretty much the same way. Say that you need to analyze some process, for instance. To analyze something means that you separate it into its basic components, and identify the relationships among the components. The “cognitive process” of conducting an analysis consists of many different behaviors.

The repertoire involved in “analyzing” may include basic reading and writing skills, making lists, identifying and classifying terms in a list, defining terms, drawing a schematic or a diagram, circling items on a diagram and drawing lines between them, measuring quantities, lining up measured values, stating constituent parts, stating relationships between parts, and so on. Some of these behaviors themselves are repertoires that can be broken down further into behavioral elements. For instance, defining a term requires that one be able to read, write, look up words in a dictionary, copy a definition, write a definition in “one’s own words,” write about limits or exceptions, and maybe give examples. When you express it this way, some of the mystery of the cognition goes away. Moreover, if a person has difficulty with a higher-order skill such as conducting an analysis, one might be able to determine which component behaviors are missing or weak, and teach directly to these components.

Low-Amplitude Verbal Behavior

Some cognitive processes may simply be the same as verbal behavior, but where the behavior occurs at a very low amplitude. Behaviorists have struggled with this problem. In a sense, the problem alludes back to the old “mind-body” distinction. One can see a body move, but the mind appears to be out of direct sight and thus “internal.” Accordingly, when referring to some types of thinking, or behavior, behaviorists speak about “inner” behavior, “covert” behavior,” or “private events.” These terms perpetuate the dualism, however. They also seem to miss out on the basic, underlying fact that the whole organism lives, behaves, and learns. To me, much of what we mean by thinking simply refers to low amplitude verbal behavior. An example of low amplitude verbal behavior might be the “conversation” one has “in one’s head.” Such a “conversation” refers to a sequence of verbalizations. This means speaking. But it means speaking at a low amplitude, one insufficient to produce sound or even

to result in much movement of the vocal musculature. By considering such “private” verbal behavior as the same behavior as the overt, public verbal behavior, but differing in level of amplitude, one not only avoids the “mind-body” dualism problems, one also avoids the various problems related to use of terms such as “inner,” “covert,” and “private.”

Behavior analysts have typically ignored the amplitude dimension of behavior. It rarely surfaces in the published scientific literature of behavior analysis. A rare exception, B.F. Skinner, in his book *Verbal Behavior* (1957) refers to, and loosely describes, an amplitude scale as it applies to verbal behavior:

The theory that thinking was merely subaudible speech had at least the favorable effect of identifying thinking with behaving. But speech is only a special case of behavior and subaudible speech a further subdivision. The range of verbal behavior is roughly suggested, in descending order of energy, by shouting, loud talking, quiet talking, whispering, muttering “under one’s breath,” subaudible speech with detectable muscular action, subaudible speech of unclear dimensions, and perhaps even the “unconscious thinking” sometimes inferred in instances of problem solving. There is no point at which it is profitable to draw a line distinguishing thinking from acting on this continuum. So far as we know, the events at the covert end have no special properties, observe no special laws, and can be credited with no special achievements. (p. 438).

Skinner’s “range of verbal behavior” refers to an amplitude scale. This scale can be clarified, as in Table 1:

Table 1: Amplitude Scale of Verbal Behavior

<u>Behavior:</u>	<u>Amplitude:</u>
shouting	High
loud talking	—
quiet talking	—
whispering	Medium
muttering “under one’s breath”	—
subaudible speech with muscular movement	—
subaudible speech of “uncertain dimensions”	—
“unconscious thinking”	Low

In some cases, then, where a “cognitive process” refers to thinking, it may mean the low amplitude verbal behavior at the “covert” end of the scale Skinner described. True, we may find the scientific study of such low amplitude behavior difficult to carry out. Such study might require that we learn how to train and calibrate individuals to be their own observers. However, for purposes of instructional design, this represents something of a moot issue.

Lest this discussion seem too abstract, our culture places some value on low amplitude verbal behavior. Consider the skill of reading. At the high end of the amplitude scale, reading could include a government official shouting out the words on a proclamation as he or she reads it. At the low end we find various types of “silent” reading. One can read “out loud,” or one can read “silently.” In many situations we prefer silent reading, as it has the dual effect of performing the behavior without bothering other people. Yet, if you wanted to teach reading to someone, you would want them to start off with audible reading. That would be the only way that you, the teacher, could provide effective and reliable feedback and instruction. Later, as a student learns to read silently, the direct measurement of the reading becomes difficult, if not impossible. At that point one may only be able to measure reading indirectly, after the fact, by means of a reading comprehension test.

Explanatory Fictions

Some cognitive processes, if invoked as explanations for what people do, may turn out to be pseudo explanations. Some people call such explanations “explanatory fictions.” An explanatory fiction has the form of an explanation. However, the process invoked as an explanation is not separate from the event or condition being explained. For instance, suppose you wanted to explain why a person routinely gets all the answers on a test correct. You might say that the person gets all the answers correct because he is intelligent. Yet, the evidence for intelligence in this case is getting all the answers correct. How do you know the person is intelligent? Because he gets all the answers correct. Why does he get all the answers correct? Because he is intelligent. Round and round such circular reasoning goes.

An explanatory fiction does not get us anywhere. It explains nothing. It may sound good. It may feel good, at first, as an explanation. Yet, because it does not get us anywhere further in understanding behavior, it will ultimately prove unsatisfactory.

All We Have Is Behavior

Whether cognitive processes are real or not, in the final analysis all we have to work with is the observable behavior. If a particular cognitive process refers to a real repertoire of behavior, we can work with the behaviors. We can see behavior. We can observe and measure action. We can see and determine the effects of behavior. We can see how it affects and changes the environment. If a cognitive process means low amplitude verbal behavior, we cannot do much about that, at least not directly. However, we can try to increase the amplitude of the behavior to make it more publicly visible. Or, we can teach a person to measure his or her own low amplitude behavior. Finally, if a cognitive process really turns out to be an explanatory fiction, we can recognize it as such, and then proceed to find some real independent variables that may change the behavior.

We do want people to have the higher-order skills. We do want people to learn problem-solving skills, for instance. Sometimes it seems that the “behavioral” skills are relegated to the lower-order behaviors and that the “cognitive” skills receive esteem from being considered higher-order. Yet, one can cut through all that dichotomy and obfuscation by recognizing that all we have to go on is the behavior. Problem-solving consists of many lower-order behaviors, some of which may have a low amplitude. And so, problem-solving means a repertoire of component behaviors. If you teach these component behaviors well, a person may then have a generalizable skill.

If you want to design good instruction, you will need to pay attention to the behavior. You will need to measure behavior directly. You will need to look for changes to behavior. If you want to use a different word than behavior, such as performance, that’s fine. For performance, too, you will need to work with the visible, the observable, and the measurable. The only secure way to tell whether a person has truly learned something is to see what that person can do after instruction. Learning refers to a change in behavior. Even psychologists often define it as such. Hypothetical cognitive processes and theories of learning may help eventually. We do not know for certain that they will or if they will. But for the present, succeeding at instruction means that a learner be able to act fluently when given a certain condition, event, or situation. ✦

References

Skinner, B.F. (1957). *Verbal Behavior*. Acton, MA: Copley Publishing Group. ✦