

## **Behavioral Systems Analysis: Fundamental concepts and cutting edge applications**

### Part II The 3 Term Contingency

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Part I of this series of articles:

- describes behavioral systems analysis as an approach that draws from two disciplines, behavior analysis and general systems theory
- asserts that knowledge from both disciplines is important for practical work because
  - behavioral knowledge about how each person will act within a specific environment and
  - general systems knowledge about how organizations and other living systems functionis essential in today's complex world
- describes  $B = f(O, E)$  as the fundamental concept of the biological, social, and physical sciences, psychology, and general systems theory.

Part II revisits  $B = f(O, E)$  briefly to show how the concept relates to a fundamental concept of behavioral systems analysis, the concept of the 3 Term Contingency.

### Introduction

What each of us does at any moment is influenced by our past experience and the current situation. Obvious? Perhaps. Important? Very. Why? Because the ability to bring our past experience to bear on a new situation enables us to learn and develop. The ability to learn from experience is closely related to a fundamental concept of psychology and general systems theory:  $B = f(O, E)$ . Human behavior (B) is influenced by variables related who the person is (O) and where the person is (E).

A child's moment to moment behavior (B) is influenced by current environmental variables (E) such as where the child is, who she is with, and what others are doing right then. Her behavior is also influenced by O variables that describe "who she is." Some O variables are genetic: Is she large or small for her age? Is she unusually active or passive? Is her skin light or dark? Some O variables are related to her learning history: What language has she learned to speak? Has she learned how to "play nicely?" Has she learned that her parents are attentive and loving or distracted and angry? Some O variables relate to the current state of her body: Is she well or ill? Is she hungry or not? Is she too warm or too cold? Behavior analysis is the study of how those all those variables influence her behavior.

The same set of variables continues to influence her behavior as she grows, learns, and joins the workforce or becomes a parent. The parental influences become a bit weaker and the influences of boss and co-workers become stronger but she responds to the same sorts of variables. The variables in the immediate environment have the strongest

momentary influences on her behavior, even though how those influences play out is conditioned by all she has learned before. There is no mystery about why the momentary influences are strongest. She is a member of a species that has survived by being very tuned in to what is happening. Being tuned in is necessary whether she is in a jungle, on a busy street, driving her car, or helping her son practice his cello lessons.

The fundamental concept  $B = f(O, E)$  helps us identify and understand the importance of both O variables and E variables. The O variables can be thought of as everything she brings with her: the genetic code she received from her parents and will pass on to her children, everything she has learned up to the present moment, and her hopes and dreams and goals and aspirations and fears. The E variables can be thought of as everything else in the entire world that has an influence on what she does. Oil production in the Middle East influences the cost of gasoline which, in turn influences how costly it is for her to drive her car, which, in turn might influence the sort of car she buys or how much she drives.

Psychology—and her life—would be hopelessly complex and impossible to understand were it not for a simple fact:

Not all variables are equally important at any given moment.

Her parents did their best, time and again, to sort out some of those variables:

(Is she sick? Is she hungry? Is she too hot or too cold? Did Jeffrey just take her favorite toy?)

Behavior analysis sorts out those variables, too. Not with the urgency of a parent but with the care of a scientist.  $B = f(O, E)$  is a fundamental concept that helps. It shows us that we must ALWAYS look toward both O variables and E variables to understand human behavior. But the concept does not tell us exactly which of the O and E variables are at work and influencing behavior.

The next concept, the 3 term contingency, helps behavior analysts (and parents and teachers and managers and friends) figure out how the variables work.

### Fundamental Concept Two of Seven

#### Fundamental Concept Two The 3 Term Contingency

The unit of analysis for behavior analysis is the 3 Term Contingency, A-B-C. All of a child's behavior, B, is influenced by conditions present when the behavior occurs and what happens just after the behavior occurs. We call the conditions present when the behavior occurs Antecedents (A); they there just before the child acts. We call what happens after the consequences, C.

We abbreviate the 3 term contingency with the letters A-B-C and cheerfully tell students, parents, or managers that they must learn their ABCs if they are to understand human behavior.

The ABCs of the English alphabet are little units that we use to construct all the English words in the dictionary. The 26 letters (and one space) combine to yield thousands of words; we combine the words in countless ways to form all the sentences in all the books and articles ever written. The ABCs are building blocks of our written language. The ABCs Antecedents, Behavior, Consequences are the building blocks of complex human performance. These ABCs form a unit of behavior, the smallest unit that is meaningful in building more complex behavior.

The 3 Term Contingency is a unit of analysis in the sense that it is the smallest “whole” unit that works in studying behavior. A—the telephone rings. B—I pick up the receiver, speak, and listen. C—I discover whether there is someone there, whether it is a wrong number, whether it is a pesky salesperson making a cold call, etc. Which one it is will influence my behavior when the phone rings again.

The operation of the 3 Term Contingency defines the basic principles of behavior. I will mention a few of the principles just to show that they relate to the 3 term contingency. The principles that follow are usually included in undergraduate textbooks. If you do not already know them just think of them as several different ways the 3 term contingency operates. Please do not try to memorize them as if there will be a test: Undergraduates or parents or managers or teachers or behavior analysts-in-training or undiscovered geniuses fully understand the principles only after considerable guided practice applying them.

Textbooks typically start with the Law of Effect which says, loosely, that behavior is governed by its consequences:

- Behavior followed by positive consequences increases (reinforcement)
- Behavior followed by negative consequences decreases (punishment)
- Behavior followed by no effective consequences decreases (extinction)

The Law of Effect mentions only two of the three terms, the B and the C. Mentioning only two terms would be fine if 3 conditions were met

1. only one behavior occurs, ever
2. that one behavior has only one consequence and occurs
3. in a totally unchanging world

Those 3 conditions are never met, of course. To make the Law of Effect useful and applicable, we must also consider the third term, the A, which represents all relevant variables in effect at just the moment the B occurs.

The principle of reinforcement states that, if good things happen when behavior occurs, the behavior is more likely to occur under similar conditions in the future. Behavior always occurs under some condition and always has some consequence so we must use

the 3 term contingency to analyze real situations. For example, a school psychologist might ask questions like these to as part of a functional analysis:

- Questions to pinpoint A  
“When is Edgar most likely to disrupt the class? What is happening in class? What time of day is it? What are other people doing right then?”
- Questions to pinpoint B  
“When you say Edgar disrupts the class, just exactly what does he do? Does he always do it in the same way? How many different things does he do to disrupt the class? Does he do different things under slightly different conditions?”
- Questions to pinpoint C  
“When Edgar does that, what happens? What do you do? What do others do? Does it happen immediately? Does it happen consistently?”

After getting a lot of information by asking the functional analysis questions, the school psychologist can begin manipulating environmental variables, attempting to change things that set up the behavior or change the immediate consequences. The same sort of functional analysis can be done for any other important behavior.

- “When is Eloise most likely to be rude to customers? What is happening right then? What has happened just before?”
- “What does Eloise do or say when she is rude? Does she always do the same things?”
- “What happens right then and there? Does the customer go away? Do you say anything to her? What does she do next?”

I could continue at length about the principles and the thousands of examples that it takes to truly define and understand them. I could continue at even greater length about the thousands of examples that show the power, generality, and practical importance of the principles. However, other people have written many volumes that do that task superbly so I need not repeat it here. Besides, only experts have to know all that.

If you are an expert, you already know it; if you are not an expert, it is not important to you right now. All that is important now is to recognize that when analyzing behavior, B, we must look at what happens just before (A) and what happens just after (C).

The practical implication is clear and important:

- If we are to manage behavior, B,
- we must assure that, under appropriate conditions (A),
- B will be followed by an appropriate C.

Easy to say but often very difficult to do. For example, the important contingencies relevant to knowledge work are often private and occur within the work itself. It is difficult to assure that “B will be followed by an appropriate C.”

Much of the difficulty relates to the time domain of the contingency. The time between B and C must be very very short. Measured in milliseconds in the lab and less that a

second anywhere. When I “manage” knowledge workers, I cannot possibly hover over them to provide “appropriate C’s” when they do their work.

Here is a simple reason the 3 term contingency is so important to behavioral systems analysis: You and I and every other person alive lives within a rolling window of time, the present moment. It is always with us and always changing. The 3 term contingency operates within this ever-present time domain. This is a very important point that is, sadly, neglected by mainstream psychology and pop psychology.

The 3 term contingency operates in the here and now. A psychologically healthy person lives in that moving window in time, acting so as to use lessons from the past and position well for the future. A psychologically unhealthy person typically spends many precious moments “stuck” in worrying about the future or “stuck” in worrying about the past. Clinical psychologists urge patients to “get in touch with the here and now!”

Connecting the moving window in time to the past and future is a practical task for each human being. It is also a critical issue for behavior analysis. Behavior analysts talk about the past in terms of a unique reinforcement history and talk about “rule governed behavior” as a bridge to the future. Understanding the mechanisms involved in connecting the moving window in time to the past and future is important to the science of behavior. On the other hand, knowing exactly what those mechanisms are is not necessary when it comes to devising practical procedures for acting intelligently. For the purpose of guiding intelligent action, now, it is enough to know that the mechanisms are built in to us. If they were not, intelligent action would be impossible and our species would not have survived.

### Applications of the 3 Term Contingency

The 3 term contingency has been with us for centuries but the applications started occurring in a planned and replicable ways only forty to fifty years ago. The first applications were case studies involving one person at a time. The number and variety of applications sky-rocketed in the 1970s and 1980s. Here in the 21<sup>st</sup> Century they are occurring all around us and being written about regularly. The Cambridge Center for Behavioral Studies has many publications detailing the work and many website links to organizations and people doing the work.

Allow me to describe how some of the current work is done and then show links to three commercial firms that earn their livelihood by knowing the 3 term contingency. The point I wish to support by mentioning these firms is that knowledge of the intricate workings of the 3 term contingencies can be quite valuable. Let me confess that I am quite biased in selecting the firms: the firms employ (or were founded by) people who have studied behavioral systems analysis at Western Michigan University.

Aubrey Daniels and his colleagues at Aubrey Daniels International have proven the value many times in the last 40 years. ADI professionals have taught the principles of behavior to thousands of supervisors and managers. Teaching managers about and helping them

use behavioral principles has been the core of the successful consulting firm for many years. More information can be found on the ADI web site: [www.aubreydaniels.com](http://www.aubreydaniels.com)

Terry McSween has different service. His consulting firm also adds significant value using behavior analysis. But Terry has done it by focusing on a very specific area that is important in all businesses, the area of safety. Government regulations, insurance costs, the costs of accidents, and humane considerations all conspire to make safety of the workforce extremely important. Terry and his colleagues collaborate with organizations to implement safety programs that work. (see [www.qualitysafetyedge.com](http://www.qualitysafetyedge.com)) The Quality Safety Edge and others apply the principles of behavior to increase safe behaviors and measurably reduce accidents and the cost of accidents.

Leslie Braksik and her colleagues have a third service model for applying behavior analysis in organizations. Leslie collaborates with her clients. Leslie and her colleagues supply the behavior analysis knowledge and her clients supply the business knowledge relevant to their specific business. The service is applying behavioral knowledge to implementing specific business initiatives. The service model is described very simply and well on the company web site: [www.clg-online.com](http://www.clg-online.com)

One of the reasons these three firms are successful is, as I have said, the consultants' knowledge of behavior analysis. In addition, Braksik and McSween have two things going for them that neither Aubrey Daniels nor I had years ago when we began. In addition to their knowledge of behavior analysis, Leslie and Terry have good business sense and a working knowledge of behavioral systems analysis.

One of the subtle but powerful points Braksik and McSween get from behavioral systems analysis appears in the way they select behaviors to reinforce. Along with Aubrey Daniels, they talk about pinpointing behavior and are careful to pinpoint important behavior. How can we reliably identify classes of behavior that are important?

In behavioral research labs, classes of behavior are identified and shaped by consequences. It is, or should be, the same outside the lab.

Important practical behaviors are identified by their consequences!

- Important safety behaviors are those that increase or decrease the frequency of accidents: proper and improper lifting, proper and improper use of safety equipment, and so on.
- Important sales behaviors are those that increase or decrease the frequency of sales.
- Important machine operator behaviors are those that increase or decrease the output of good products.
- Important reading behaviors are those that increase or decrease reading comprehension.
- Important social behaviors are those that help or hinder developing good relationships with others.

It makes a lot of sense when you think about it. Unfortunately, there is another way to identify “important” behaviors: ask people what they are! Or do it more efficiently with a questionnaire! These are very common ways to do it as can be seen by reading a book on competencies such as the one by David Dubois, (1998) *The Competency Casebook*, published by ISPI/HRD Press.

It would be nice if asking people or using a general questionnaire were all it takes. Unfortunately, people are often wrong, identifying traditional practices that worked in another time, benchmarking practices thought to work in another setting, and sharing superstitions. I learned that the hard way. Years ago, when I began teaching methods of reading instruction at the University of Michigan, I would ask expert teachers (teachers whose students consistently learned to read) to come into my class and tell teachers-in-training just how they do it. The experts came in and told teachers-in-training all sorts of wondrous things. What they said did not describe what I had seen them do at all. I soon stopped asking them to tell and started asking them to show. It worked. They could show, just not tell.

I thought at the time that the difference in what they say and what they do might be unique to expert reading teachers. Research on expertise done years later has clearly shown that it is a characteristic of experts in general. Doing it and saying it are very different skills. Very few who are good at doing it have also developed the skills necessary to be good at saying it.

Competent behavioral systems analysts always look at both behavior and consequences. Tom Gilbert, in his book *Human Competence* (1996) emphasized this point by arguing that we should always select behaviors by looking at both behavior and what the behavior accomplishes, never just at the behavior. Here is one simple example. Way back in the dark ages when I was playing high school basketball coaches knew the best behavior to use in shooting free throws: Hold the ball in both hands, bring it down between your legs, bend your knees and bow your legs slightly, then bring the ball up from there and propel it toward the basket. Never mind that “the right way” to shoot free throws could not be used (and practiced) anywhere else; never mind that everyone on our team could make more free throws with a different shot. Coaches knew the right way. (Our coach was progressive; he finally caved in to our complaints and allowed us to shoot in a way that scored points.) Gilbert has many business examples in the book, including several in which a worker thought to be the worst because he or she did things differently than others was actually the best in terms of accomplishment. Standard practices are often lead to mediocre results.

Gilbert argued that we should focus, not on behavior, but on performance. He defined performance “behavior plus accomplishment.” He argued that the job of management is to manage performance, not behavior. Behavior, he said, contributes to the cost of doing business: the value is added by what the behavior accomplishes. People who belong to the International Society for Performance Improvement typically use Gilbert’s definition of performance. Braksik and McSween are aware of the definition and make sure that they and their clients pinpoint behavior that accomplishes something of value. That

might seem a small thing but, in my experience people in business pinpoint value-adding behavior only about 80% of the time, unless tasked with identifying “the skills or competencies required to do a job,” when it drops to about 20%. People in human services seem to me to pinpoint pointless behaviors about 80% of the time.

It might be helpful to know whether or not perception is close to reality. If it is, huge amounts of human energy are being wasted. Be that as it may, Braksick and McSween help their clients focus on behaviors that are, by Gilbert’s definition, components of valuable performance. It is one of the ways they assure that clients get their money’s worth.

Conclusion—an invitation to think

You are invited to think about what you have just read. Here are some ways to start:

1. Ask the pinpointing questions about a behavior that occurs regularly at work (perhaps you wish that it would not). Compare what that suggests to you about the behavior with what you think about it now. Talk with others about the behavior and note whether or not they tell you about anything you learned by pinpointing.
2. Think about behavior you have observed until you have a couple of examples of behaviors that have delayed consequences that are bad and immediate consequences that are pleasant. Talk with others about those behaviors. Do the same with examples of behaviors that have delayed positive consequences and immediate negative consequences.
3. Talk with someone who has studied behavior analysis carefully for several years. What has changed in the way they look at what people do?

Just as Part II was devoted to the unit of analysis for behavior when O is a person, Part III is devoted to the unit of analysis for behavior when O is a total organization. Part III begins to show how Gilbert’s definition of performance is useful and how to identify which behavior and which performance to improve.

## References

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