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## A Realistic Perspective of the Art and Science of Forensic Psychophysiology

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In the early 1960s, Cleve Backster – perhaps the most brilliant polygraph innovator our profession has known – developed major changes in technique structure and introduced many intensely needed psychological concepts to advance our profession. One of the major changes he introduced in technique development was the change in question sequence format from a traditional Relevant – Comparison question sequence, to a structure that introduced placing the Comparison before the Relevant, or a Comparison – Relevant sequence.

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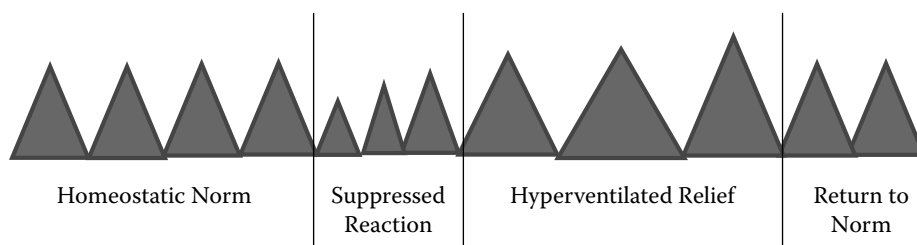
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Backster, maintained – in our opinion correctly – that a major problem in our profession were False Positives, i.e. truthful examinees being wrongly diagnosed as deceptive. He reasoned that by allowing the truthful examinee to hear first their most salient question, i.e. the Comparison question, the number of false positives would be reduced.

Backster’s early appreciation of physiology and recognition of how the body maintains a homeostatic balance supported his belief. Homeostasis, an organism’s need to maintain an ideal internal physiological environment, what all living things need to thrive, as later redescribed by Handler et.al. as allostasis. Allostasis is the process of achieving stability, or homeostasis, through physiologic or behavioral change. By design, our brain ensures that our internal functions remain in balance.

Wikipedia says that “the concept of allostasis was proposed by Sterling and Eyer in 1988 to describe an additional process of reestablishing homeostasis, but one that responds to a challenge instead of to subtle ebb and flow. This theory suggests that both homeostasis and allostasis are endogenous systems responsible for maintaining the internal stability of an organism. Homeostasis, from the Greek *homeo*, means “similar”, while stasis means “stand”; thus, “standing at about the same level”. (The term was not coined as “homeostasis” or “standing the same” because internal states are frequently being disturbed and corrected, thus rarely perfectly constant.) Allostasis was coined similarly, from the Greek *allo*, which means “variable”; thus, “remaining stable by being variable”. Allostatic regulation reflects, at least partly, cephalic involvement in primary regulatory events, in that it is anticipatory to systemic physiological regulation (Sterling and Eyer, 1988; Schulkin 2003).”

As a result, if something causes a change in our normal physiological functions in one direction, there will be a countervailing change to return us to a homeostatic norm. We refer to this as reaction and relief or compensation. Consider the following respiratory patterns:



If we present a truthful (as later verified) examinee with a Comparison question first, which should be the most salient stimulus to a truthful individual, a physiological response mediated by the autonomic branch of the peripheral nervous system (PNS) should occur. According to Backster's published theory of psychological set, the subject is then less likely to react physiologically to the adjacent Relevant question. This phenomenon will occur even though there is still some saliency to the Relevant question because of the body's need to regain a homeostatic normalcy and compensate for the subject's previous reaction to the Comparison question. In other words, for the examinee later verified as truthful, reacting to the Comparison question actually reduces their ability to react physiologically to the following Relevant question, even though the Relevant question still may hold some degree of saliency due to the emotionality of the relevant issue, fear of error, accusatory interrogation prior to the test, and a plethora of other reasons. Allowing the truthful examinee to respond first to the Comparison question therefore may reduce false positive outcomes. We can envision the need to maintain an allostasis or homeostatic normality almost like the "push-pull" motion in a game of Tug of War where each opposing team is trying to pull the other past the point of no return. When one team pulls harder, the other team pulls back trying to regain control. If we have two evenly matched opponents, even though there is back and forth movement, we would expect eventually each team to end up equidistant from the center. In human psychophysiology this is what the sympathetic and parasympathetic systems do so the body maintains its balance.

One of the concerns this positioning of the Relevant versus the Comparison question in the traditional Backster Zone Comparison Technique creates is the employment of the "Sacrifice Relevant" question (#39). If we ask a person, "Regarding whether *you did the crime*, do you intend to answer each question truthfully about that?" In the subject's mind, they have just been asked a Relevant question. This Sacrifice Relevant is asked to allow the examinee to first hear the "relevant" words, which will be asked later in the test per the Relevant questions, and at a spot in the test which will not be evaluated. This question is often referred to as an "ice-breaker", and usually creates a physiological reaction in both the truthful as later verified and the deceptive as later verified.

If a more serious problem in the search for truth is how to have truthful people produce truthful data, why would one want to start the test only by directing them to the relevant issue? More importantly, if Backster's concept that allowing the truthful examinee to hear their threat first is correct, it

makes sense to see what this question does psychophysically. It creates a reaction in almost all examinees, whether truthful and deceptive. If the body has an autonomic nervous system mediated reaction, it now wants to compensate, and the immediately following question, which in the Zone format is the first Comparison question, has less potential to show reaction.

The original Backster sequence, still used by the Federal Government, actually corrects this problem. By following the Sacrifice Relevant with the Symptomatic question which thus acts as a buffer, allowing homeostatic norm to be recovered prior to the first Comparison question being asked. In both the Utah and Integrated Zone Comparison Techniques the Sacrifice or Weak relevant questions are followed by an Irrelevant question to serve this purpose.

When we look at evidence-based techniques we have to ask whether we should be searching for validated techniques or principles? Validated principles maintain that if techniques employ the same principles, then what works for one must work for the other. Validated techniques maintain that a minor difference in techniques requires each technique to have its own independent research to support it. The American Polygraph Association, in its meta-analysis report elected the latter path for validation.

What the current position fails to recognize are the variations that may individually occur between different examiners, even though they use the same technique format. A polygraph test is much more than just a technique/format structure. A polygraph test encompasses everything that happens to an examinee and everything that is said from the moment he or she arrives for the examination until the data has been collected.

For example the Federal Zone of Comparison has been shown to have a certain degree of accuracy based on research. What happens to that accuracy if the examiner decides to place the victim's name in the Comparison question? We expect a reaction to take place in the Sacrifice Relevant question for both the truthful and deceptive examinee: "Regarding whether you had sexual intercourse with little Suzie, do you intend to answer each question truthfully about that?" For the deceptive it is obviously a lie when they respond "Yes". For the innocent there is still the emotionality of being accused of such a repulsive act. In 2008, Dino and Fowles researched and reported in *Psychophysiology* that the semantics of a word can in itself cause arousal.

Following the Sacrifice Relevant question, the Symptomatic question is then asked: "Do you believe me when I promise not to ask a question I have not

gone over word for word?” and allostasis or homeostatic norm is now returned.

The first Comparison question is now asked, “Not related to Suzie, during the first \_\_ years of your life, did you ever .....?” We expect the truthful suspect to react to the question because their “No” answer is a probable lie, and psychologically they are uncertain as to whether or not lying to this question may cause them to fail the test, which has been implied to them by the examiner. However, for the deceptive suspect, who molested the little girl, he now hears the victim’s name in the question, which most likely will produce reaction, as was illustrated in the previously referenced research of Dindo and Fowles. Consequently, we have started the physiological tug of war, and have reduced the person’s ability to react to the next question, which is the Relevant question, “Did you have sexual intercourse with Suzie?”

How can the research on the Federal Zone – when used without the victim’s name in the Comparison question – support the validation of the Federal Zone when the Comparison question contains the victim’s name? In our opinion, it cannot and would need individual research to validate this significant change in test question construction.

How can research on a specific Zone Comparison Technique test where the interview is conducted in an unbiased manner support the same technique if the pre-test interview is biased toward obtaining a confession? After a combined career of well over 70 years of polygraph testing, teaching and quality controlling polygraph examinations, it is our opinion that it cannot.

As we attempt to move our profession from an anecdotal craft to an evidence-based science supported by research validated techniques, we should not lose the perspective and reality that there are numerous variables that positively or negatively affect the outcome of an examination regardless of the scientific research supporting any given technique. In our opinion we must be mindful that regardless of the validity of the technique the accuracy of the outcome is directly correlated by the training, experience and natural talent of the individual forensic psychophysiologicalist applying the technique. Perhaps this is the paradox of our profession?

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