

Good intentions that fail to cope with the main point in CQT

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A comment on Palmatier and Rovner (2014)

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Abstract

Palmatier and Rovner (2014) made an important attempt to bridge the gap between the accumulated practical experience in field polygraphy, including the increased body of scientific work done by scientists and practitioners within the field and the academic attitude towards Polygraph Testing. They say that the two main polygraph methods, the Concealed Information Test (CIT) and the Comparison Question Test (CQT) though using different protocols, in the end deal with lying and can be explained under the same theoretical concept. They proposed that the Preliminary Process Theory (PPT) developed by Barry R.J. in a totally different context, should be adopted for the construct validity of psychophysiological detection of deception (polygraph). The current commentary argues that even if in the end, the examinee lies (or tells the truth) in both types of test, it does not mean that lying has been measured directly. Instead, the tests represent the efforts to deduce about veracity in the absence of any specific physiological feature representing deception. Moreover; the two methods are not just two different protocols rather; their underlying rationales are different and cannot be reduced to a comprehensive common construct. With regard to PPT, it is pointed out that the explanation of the most important element in CQT, namely, the differential relative significance that truthful and deceptive examinees are expected to attribute to relevant vs. comparison questions, is out of its scope and therefore, unlike the authors' suggestion its place as a cornerstone in the construct validity of polygraph testing is questionable.

Keywords: polygraph theory; polygraph testing; CIT; CQT; construct validity; preliminary process theory (PPT)

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John Palmatier and Louis Rovner (2014) in their paper "Credibility Assessment: Preliminary Process Theory, the Polygraph Process, and Construct Validity", published in the current issue, made an important attempt to bridge the gap between the accumulated practical experience in field polygraphy, or psychophysiological credibility assessment, including the increased body of scientific work done by scientists and practitioners within the field and the academic attitude towards Polygraph Testing. In their own words "Here, our goal is to merge extensive personal (i.e., real-world) experience with relevant findings from the scientific literature and empirical studies, to examine objectively the two polygraph procedures most commonly used for the assessment of credibility." Furthermore, they suggest that the Preliminary Process Theory (PPT) that has been developed by Barry R.J in the last two decades (Barry, 1996, 2006, 2009, 2012) explains the differential physiological responding witnessed during the instrumental assessment of credibility, regardless of the protocol used and should be adopted as a cornerstone in the theoretical construct underlying the use of "Polygraph Tests" for credibility assessment. They go on and claim that this conceptual framework provides an inclusive theoretical foundation for the use of both the CQT and CIT procedures in assessing credibility of examinees. For the sake of the readers that many of them are probably not familiar with the various methods used in polygraph testing, be it CQT or CIT, and their proposed rationale and protocols, a short presentation of them, which unfortunately, Palmatier and Rovner (2014) article has spared, is needed.

The Concealed Information Test (CIT) originally referred to as the Guilty Knowledge Test (GKT) (Lykken, 1960) or some sort of Peak Of Tension (POT) (Reid & Inbau, 1977), is used to determine whether the examinee is aware of details of a crime or an event that have been kept from the general public and would presumably only be known to the perpetrator of the crime or those with incriminating knowledge. In fact, it is a series of multiple-choice tests, in which there is only one critical item in each series and several similar but non-critical (control) alternative items which an innocent suspect who has no crime-related knowledge cannot discriminate from each other in terms of their relevancy to the case. The lead question, for example, in a series can be: Do you know whether the brand name of the stolen laptop was: 1. HP? 2. Samsung? 3. Acer? 4. Dell? 5. Toshiba? 6. Lenovo? 7. Asus?

In a pre-test interview, the examiner explains the test procedure to the examinee, presents the questions, and makes sure that everything is understood. Then, the actual testing phase starts.

The expected answer to each question is denying the knowledge ("NO"). Usually each question is repeated in a different order of the Multiple-choice items. The decision rule is based on the expectation that a guilty examinee will physiologically react to the critical items while the innocents will spread their reactions among the various items. Note that it is not expected that a truthful examinee won't react at all to the questions since the measured physiological reactions are not "Lying Reactions",

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and in fact, the practical experience as well as the theoretical rationale tells us they might be the product of some other factors.

The CQT is a more complicated procedure. Briefly, the CQT is administered in the following stages: After the examiner becomes familiar with the facts of the case by reading a written report and/or by speaking directly to the person who ordered the examination, and a draft of the target questions is prepared, the examiner meets the examinee and conducts an extensive non-interrogative pre-test interview in which the examinee is given the opportunity to talk about the offense and present his or her version of the case. The series of questions, to be asked later in the actual examination stage of the polygraph test, is finalized during this interaction in which the examiner also maneuvers the conversation to cover a wider spectrum of attitudes and previous possible misconducts of the examinee in order to lay the foundation for proper Comparison questions. The examiner discusses the formulation of the questions with the examinee and ensures that he or she understands them and can give a direct "yes" or "no" answer to each question. The examiner explains the testing procedure and informs the examinee that the examination is voluntary. The next stage is to attach the examinee to the polygraph, and the actual examination stage takes place by asking the prepared series of questions while continuously measuring the physiological reactions. The questions are mainly of the following three types: (a) Relevant questions- dealing directly with the issue/crime under investigation, such as the "Did you do it?" type (e.g., "Did you steal the laptop from the blue classroom yesterday afternoon?"). The number of relevant questions per series is usually 2-4; (b) Comparison questions -focusing on general, non-specific misconducts, normally but not necessarily, similar to the issue under investigation (e.g., "Have you ever taken without permission something of value that did not belong to you?"). The number of Comparison questions is 2-5 per series; (c) Irrelevant questions – focusing on completely neutral issues, (e.g., "Is today Tuesday?") which are intended to absorb the initial orienting response evoked by any opening question, and to enable rest periods between the more loaded questions. The number of Irrelevant questions per series is usually 1-4. Typically, the whole question series is repeated three to five times in different order.

The inference rule underlying the CQT is based on comparing the physiological responses evoked by the Relevant and Comparison questions. Deceptive individuals are expected to show more pronounced responses to the Relevant questions, whereas truthful individuals are expected to show the opposite pattern of reactivity (i.e., the physiological responses to the Comparison questions are more pronounced than the responses to the Relevant questions). The physiological records of the various measures are usually scored by a numerical system that compares the physiological reactions shown in each Relevant question to those of adjacent Comparison questions, and attached a numerical value to the magnitude of the difference found in each comparison point. These numbers are summed up to a total score which in relation to certain cutoff scores indicates deception or truth telling.

It is clear from the above that the difference between the two methods is more than just protocol variations. Nevertheless, in their attempt to reconcile between the advocates of these two credibility assessment types of test, the authors preferred to ignore the differences and claim that "...whether it is a comparison question, or a question addressing the issue at examination (i.e., a relevant question in a CQT, or critical item in a CIT), when an individual's verbal response to a question is factually different from what he knows or believes to be true, he is lying (i.e. being deceptive)." In the context of their paper, this claim leads to a subtext call to propose a theory that

accounts for this "lying" and its physiological manifestation in any Polygraph Test, be it CIT or CQT. While this call is a legitimate call, the claim per-se that when an individual's verbal response to a question deviates from what he knows or believes to be true, he is lying, does not mean that the measured physiological responses are "Lying Features" in the sense that detection of this features indicates deception. It is also not enough for making an extra step to conclude that a unified theoretical rationale or construct that explains the dynamic of lying and its manifestation in "Polygraph Testing" is within our reach and in particular, can remedy the unfortunate situation of not having a good theoretical construct underlying the detection of deception procedures (mainly CQT) as was pointed out by the NRC report (NRC, 2003). It is therefore, very interesting, though somehow puzzling, to find out that the authors have spotted such a theory on the shelf, namely the Preliminary Process Theory (PPT) (Barry,1996,2006,2009,2012).

The idea that inasmuch as an act of lying is involved in both types of test (CIT & CQT), it is reasonable to search for a common theoretical concept and a common physiological activity, might suit the philosophy underlying Physiological Psychology. A main premise in the field of Physiological Psychology, whether declared or latent, is that any psychological state is a representation of an equivalent or parallel physiological state. Meaning that any variation or change in the psychological sphere be it cognitive, emotional or otherwise, indicates the occurrence or existence of a specific physiological change in the individual. Lying is no exception to this premise, and if we can experience and define a mental state, cognitively and emotionally that is unique to the act of lying, in principle, there must be a parallel physiological state. More than that, if we consider the psychological state of being "polygraphed" while lying, to differ from being "polygraphed" while telling the truth, in principle, within the realm of Physiological Psychology, the existence of different physiological activities or patterns, probably in the brain, between these two states of mind are assumed.

We are very far from identifying the exact brain activity or dynamic pattern that indicates sheer deception per-se, in the sense that every time we lie; this activity occurs and it never occurs in the absence of lying. But in the last fifteen years, some interesting brain research studies have been conducted, trying to pinpoint brain structure and activity related to deception. By pointing out this accumulating work, the authors tried to lay down some foundations for a construct validity of polygraph testing as a means for credibility assessment. Unfortunately, whether we accept or doubt the proposed conclusions of the various studies, for instance, that telling the truth constitutes the default of the human brain, while lying involves intentional suppression of the predominant truth response (Verschuere et al. 2011), we are still very far from a point that enables us to use this body of research as a functional part in the construct validity of physiological detection of deception, let alone formats of polygraph testing. Thus, for the time being, it is more appropriate that the use of physiological measuring for detection of deception should be dealt within the realm of Psychophysiology rather than Physiological Psychology and with the former, the aforementioned premise does not hold, particularly when peripheral psychophysiology is considered. So, we have to accept the notion that the only peripheral physiological change which is unique to deception can be traced to the fairy tale Pinocchio and his nose (Ginton,2009). Polygraphic lie detection or Psychophysiological Detection of Deception (PDD) is not based on devices and methods that detect and measure specific and unique psychophysiological activity that is the representation of the psychological state of mind of lying. Rather it is an attempt

to use devices and methods that enable the deduction about the examinee's state of mind in this respect (lying or telling the truth), in the absence of such specific and unique physiological patterns. It is true that polygraph examiners measure and look for certain physiological activity or features in several peripheral physiological systems; usually Cardiovascular, Respiratory and Electrodermal, while the examinee is telling the truth or lying about certain facts. But the detected physiological activity is meaningless in this respect unless it was measured after specific preparations and under specific controlled conditions and compared to physiological activity measured while the examinee answers other questions. These controlled ways of conducting the polygraph test promote the ability to make probabilistic decisions (*grosso modo*) about the veracity of the examinee not because they manage to measure the unique physiological manifestation of lying or telling the truth, but because they manage to detect some qualities that are assumed to correlate with lying under the specific controlled conditions of the tests (Ginton, 2009). From the above, of course it follows that neither CIT nor CQT detects directly lying (or lies). In addition, it should be stressed that CIT and CQT are two different methods which the assumed qualities that are expected under each one of them to correlate with deception are different, and this very fact, questions the premise that a common comprehensive theoretical explanation underlying the two methods does exist.

The main assumption under the use of the Concealed Information Test – CIT, is that the lying person, who denies being involved in the crime, knows the concealed information and therefore, recognizes the relevant question and differentiates it from the other questions posed to him/her, while the uninvolved person who tells the truth cannot differentiate between the questions. The physiological activity accompanying the relevant question is different for the deceptive and the non-deceptive examinee, but can we consider the detected physiological reactions that accompany the relevant question in the lying person, as a direct manifestation of lying? There are a lot of indications that this is not the case. For instance, if the examinee is instructed to reverse his or her answers and reply with an affirmative answer (YES) to each question, meaning that the deceptive person is telling the truth while answering the relevant question and lying to each of the other questions, the physiological activity accompanies each question will be quite similar to what has been measured while answering NO to each question (e.g. Kugelmass, Lieblich & Bergman, 1967). Thus, the main factor that plays its crucial role in detecting the lying examinees and differentiates them from truth tellers is whether or not the examinee recognizes the concealed information and not whether he lies about it (Meijer, Klein, Selle, Elber, & Ben-Shakhar., 2014). That is the reason why CIT is first and foremost considered to be a recognition test that under certain conditions might help to detect deception and not a pure lie detection test. CIT is effective in identifying liars due to the factual correlation found between recognizing the concealed information embedded in the relevant question and deception. Perhaps this is the place to add that when it comes to recognition, the OR concept and its derivatives have a respectable place (e.g. Ben-Shakhar & Eyal, 2002, p.89).

Contrary to that, CQT is a method in which any examinee recognizes the relevant questions and the test's potential to differentiate between truthful and non-truthful examinees lies in totally different areas. The claimed rationale behind the CQT is that guilty people, as a group, knowing that they are lying, focus their anxiety and tension on the Relevant questions at the expense of not paying enough attention to the Comparison questions, even though they have been skillfully manipulated by the examiner to answer these questions with probable lies, or at least they cannot be

certain about the truthfulness of their answers. Innocent people, in contrast, as a group, are more concerned with the comparison questions and the veracity of their answers to them because relatively they are less engaged with the relevant questions. This differentiation in concerns between the guilty and innocent examinees is manifested in the locus of their most vigorous psychophysiological autonomic reactions (Backster, 1963a,b; Reid & Inbau, 1977; Kleiner, M., 2002; Raskin & Honts, 2002; Handler, & Honts, 2007; Ginton, 2009; Handler, Shaw, & Gougler, 2010). Thus, as mentioned above, the correlated factors with deception in this test bear different rationale than CIT and therefore, cannot be explained under the same theory, unless it is an umbrella kind of theory that explains some very basic elements and in fact, is far from laying the foundations for proper construct validity. For instance, suggesting that saliency is the key factor in explaining why an examinee reacts differentially to different stimuli (i.e. questions) in polygraph test, is important (Senter et al., 2010) but in the context of CQT, it does not explain why for truth-tellers, the comparison questions are more salient than the relevant ones, while the opposite is expected from the liars. A similar mistake is done by Palmatier and Rovner (2014) in their paper when proposing Barry's Preliminary Process Theory (PPT) as a main theoretical construct underlying polygraph testing. After presenting the empirical data gathered in the last two decades, showing that CQT works much above chance level in correctly differentiating between truth-tellers and liars (e.g. NRC, 2003; Ginton, 2012; Raskin & Kircher, 2014), information that unfortunately many academics tend unjustifiably to ignore, they claimed that PPT has the potential to account for many of the findings and phenomena found in polygraph testing be it CIT or CQT. I admit that my understanding of the PPT is quite limited, but based on my limited knowledge it seems that PPT might be an interesting construct to explain why the physiological responses to the various questions in CIT feature as they do and probably to do it to a better degree than the classic OR theory. In addition, it might explain why certain physiological features are more indicative than other in both methods (e.g. respiratory suppression or decrease in pulse rate). But I can't see how it explains the differential reactivity to Relevant vs. Comparison questions found between liars and truth-tellers when it comes to CQT polygraph test, which should be a main point in the construct validity of the current polygraph testing.

It seems that the authors' error resulted from confusing between the underlying rationale and the inference rule of the test. In their article, they claim that the underlying rationale for the CQT is "simply stated, more pronounced and more consistent physiological responses to control [i.e., comparison] than to relevant questions leads to a decision of truthfulness whereas greater responses to relevant questions leads to a decision of deception" (Horvath, & Palmatier, 2008, p. 889)". Well, this is not the underlying rationale of CQT, this is just the inference rule. Then they added that " Consequently, if a person claimed to be truthful, for example, the copilot mentioned earlier, who said he had no knowledge of the cocaine or money, then Barry's (2009) PPT (see Fig. 1) would predict that due to the greater relative significance (i.e., comparison versus relevant), when asked a comparison question the sequential processing of the stimulus begins....". Thus, it is clear from the above that the PPT does not predict or explain why the comparison questions bear a higher significance for this copilot, but given that this is the case it predicts the kind of sequential processing of the stimulus and the physiological activity that accompanies these questions. This is an important contribution in understanding the relation between certain psychological states of mind and physiology but unfortunately, the missing link, i.e. the expected explanation of the psychological mechanism that

induces the reversed pattern of differential salience in truth-tellers versus deceptive examinees in CQT, is very crucial for polygraph testing theory. Therefore, I can't accept the suggestion made by Palmatier & Rovner (2014) to consider PPT as a proper cornerstone in polygraph testing construct validity.

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