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Selecting the Most Optimal Conditions for the Polygraph Examination

Key words: examinee phisical and mental condition, habituation, experimental detection of deception, motivation of examinee

Introduction

We wrote (Saldžiūnas and Kovalenka 2008, 2009a, b, c, d), just like other authors, about the conditions of the polygraph examination which enable obtaining maximally objective and reliable results. Let us remember that the stimulus (or the question) applied and the environment are among factors important for the examination. The impact of the stimulus on the responses depends on the way the question is formulated (Kniazev et al. 2012) and on the depth, timbre, and duration of the voice

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of the examiner asking the question. The element of the environment consists of external noise, distracting details on the premises of the examination, etc. (Saldžiūnas and Kovalenka 2009c). It must not be forgotten that the psychological microclimate that the examiner creates during the examination is important for the results as well. Scientists from various countries have expressed the opinion that comparison question tests (CQT) may not be applicable for polygraph examinations (Ben-Shakhar 2002; Fiedler et al. 2002; Furedy 2009; Iacono 2011; Patrick 2011). In their opinion, there are scientific grounds only for polygraph examinations using concealed information test (CIT) and the event knowledge test (EKT, a modification of the CIT). There is one more important circumstance due to which the use of CQT may be limited. Defending the results of CIT-type tests in courts is easier for the examiner in some countries (especially in Europe and Japan) (Nakayama 2002; Osugi 2011; Saldžiūnas and Kovalenka 2013). Below in the article we compare CQT and CIT also using the model of influence of various psycho-physiological factors we have suggested.

Influence of the examinee's physical condition on polygraph examination

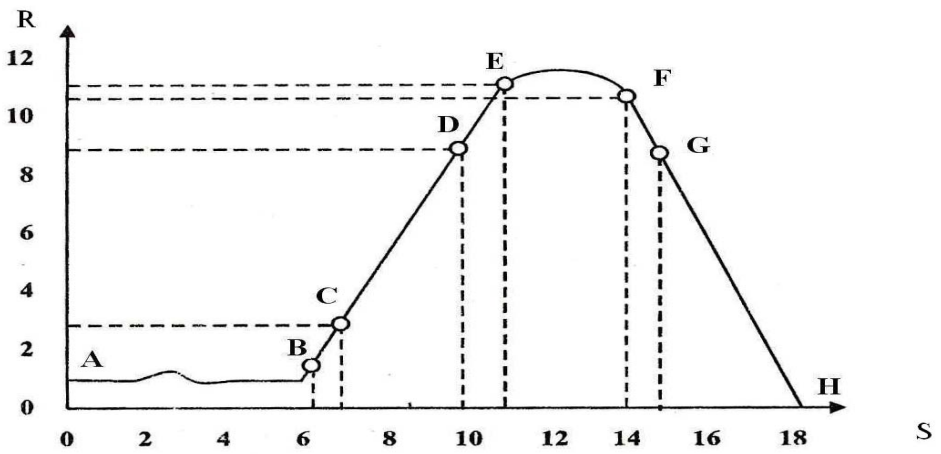

Figure 1. Dependence of the magnitude of relative response (R) in polygraph subjects on the subject's emotional stress (S) [according to Varlamov et al. 2010)]

The dependence of a person's potential relative responses to stress is illustrated in Figure 1. If the examinee is stressed between the points A and B, he or she may be apathetic to external factors, including a polygraph examination. This may happen if the examinee is physically, psychologically and/or emotionally fatigued. Varlamov

(2010) recommends examining when the subject's level of stress is contained between the points B and D. In this section of the curve, the magnitude of the subject's psycho-physiological response may be dependent almost linearly on the increase of emotional stress, which means that as the stress increases the magnitude of the psycho-physiological response rises proportionally. If the examinee is in the EH section of the curve because of very high stress, responses measured by the polygraph may be interpreted incorrectly by the examiner (or the polygrapher may altogether fail to measure the change of the psycho-physiological response). This means that, if the functional capabilities of the suspect arrested by the police are, for example, in the section DE of the curve because of stress, the person's functional capabilities will end up in the part EH of the curve because of the additional stress caused by the relevant question and thus the measured psycho-physiological responses cannot be used when evaluating the effect of the question on the examinee. Therefore, the examiner must assess the state of the examine before the examination. If the examinee does not participate in the pre-test conversation actively enough and demonstrates hardly any interest in the examination, it may be assumed that the examinee is tired or has taken medications suppressing physiological functions (Varlamov 2010). This may mean that the examinee's organism is between the points A and B (Figure 1) and the examination must be rescheduled. Visual assessment whether an examinee is fit for the examination is sometimes very difficult for the examiner. Which is why demonstration tests (DT) are recommended (Krapohl 2010). In EKT, we use only adaptive question (Saldžiūnas and Kovalenka 2008a). After a DT, polygraph charts allow to see whether the examinee's responses are excessively labile or highly indifferent (Krapohl 2010; Soschnikov et al. 2008). Varlamov (2011) and the authors (Saldžiūnas and Kovalenka 2014) maintain that assessing whether the examinee has consumed medications as a countermeasure is possible with regard to the magnitude of tonic electrodermal activity (EDA). When tonic EDA is equal to or exceeds 300 kilo ohms, the examinee may be believed to have consumed medications before the examination or to be a drug addict. Several computerised polygraphs can register tonic EDA. If there is an assumption that the examinee has consumed medications that can influence reaction of examinee, the examiner must decide whether further examination will be useful and whether continuation is practical.

Factors influencing the magnitude of responses recorded in polygraph charts

Scientists have tried to create a model that would explain the psycho-physiological processes taking place in the subject's organism during a polygraph examination. A few dozens of models have been created (Handler and Honts 2007; Kleiner 2002;

Kniazev and Varlamov 2012; Moltshanov and Babikov 2012; Verschuere and Ben-Shakhar 2011). The process of building models continues, as there is still no model that would fully explain the psychophysiological processes, whether in laboratory or field examinations, and whether in CQT or in CIT. What probably explains the psychophysiological processes of the examination best is a model based on the phenomena of orienting responses (OR) (Sokolov 1966). According to Verschuere et al. (2009), the defensive response is the organism's answer to an aversive event. Although OR and DR are functionally different, they are often difficult to distinguish. Both reflexes are characterised by an increase in skin conductance. One of the easiest and straightforward means to discriminate the two reflexes is to examine the heart rate response: OR is associated with heart rate deceleration, and DR – with heart rate acceleration (Verschuere et al. 2009). Verschuere et al. (2010) tried to evaluate the named patterns in field polygraph examinations of the Belgian Federal Police but, as far as the authors understood, not quite successfully. The authors reviewed the polygraph charts of the field criminal investigations performed in Lithuania in 2008–2012 and did not find in the polygraph charts any obvious patterns in the change of heart rate that would help discriminating between OR and DR. Each examinee's psyche is individual, individual resistance to stress is different, the examination conditions cannot be ideally the same in all criminal investigations, even the questions in a single test are not the same with regard to their significance for the examinee; therefore, we believe that OR or DR evidence itself for each examinee individually. The authors believe that it is too early to apply models in which OR and DR may be distinguished in field polygraph examinations.

Research of Verschuere and Ben-Shakhar (2011) suggests that emotional-motivational factors such as overt deception and motivation to avoid detection may increase CIT. The emotional-motivational factors can increase the significance of the relevant items. All told, OR theory can explain most of research findings related to the CIT. On the other hand, OR theory faces several challenges. First, significance is a very useful concept but it is also too broad and vague (Verschuere and Ben-Shakhar 2011).

After a review of the scientific articles (Handler and Honts 2007; Kleiner 2002; Kniazev and Varlamov 2012; Moltshanov and Babikov 2012; Verschuere and Ben-Shakhar 2011) and on the grounds of field polygraph examinations by conducted by us and our peers from neighbouring countries (Kniazev and Varlamov 2012; Nakayama 2002; Saldžiūnas and Kovalenka 2008, 2009a, b, c, d; Varlamov and Varlamov 2010), we tried to draw up a chart illustrating the way various psychological factors influence the magnitude of psycho-physiological reactions during a polygraph examination (Figure 2). We wish to note that we tried to model the influence of various factors to the magnitude of response during the whole examination which may continue for anything up to 1 or 2 hours. It is our first try to draw up such a model.

We are not certain whether it is complete and perfect. We hope that it will be the first step to help to understand better the requirements that must be set for the newly created tests.

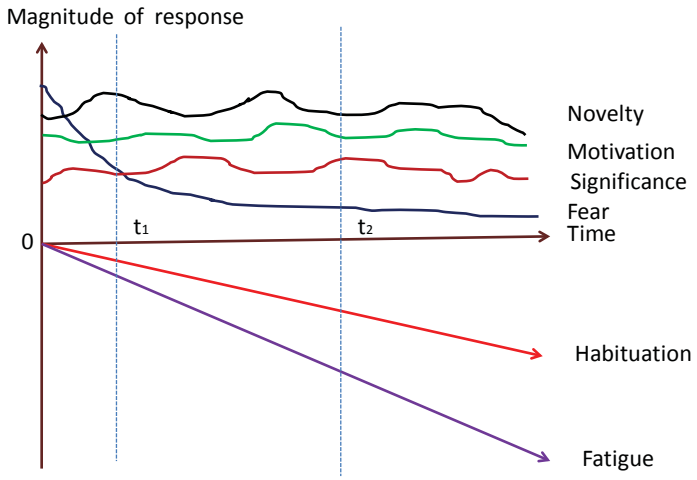

Figure 2. The model of a change in the examinee's magnitude of relative response during a polygraph examination

We included the factors of novelty, motivation, significance, fear of waiting, habituation, and fatigue during the polygraph examination (Figure 2). Our following estimates are based on the results of Gati and Ben-Shakhar (Gati and Ben-Shakhar 1990) who revealed there is no evidence for interaction between factors.

Novelty. The idea that phenomena of orienting responses (OR) are evidenced in psycho-physiological measurement by a polygraph is suggested in all academic papers discussing the model of polygraph examination (Verschuere and Ben-Shakhar 2011). Pavlov (1927) sometimes called it the "what is it" response. Bradley (2009) demonstrated the importance of OR phenomenon in his laboratory research as well. Bradley in turn uses the concept of "novelty" which we found suitable for our model. Certainly, novelty will not be steadily the same throughout the whole polygraph examination. The novelty-produced response may increase or decrease during the actual examination. Overall, the way novelty impacts the magnitude of the produced response requires additional research (Ben-Shakhar 2000).

Motivation. When reviewing the methodologies of the examination, some authors (Handler and Honts 2007) take almost no heed of the motivation factor. Varlamov (2010) considers motivation to be one of the most important factors ensuring a use-

ful examination. Probably, all professional examiners have experienced that registering a response is more difficult when investigating a case of a theft of 100 dollars than when investigating a case of a murder. Examinees have major stress in case of a murder. Bradley (2009) suggested that emotion is fundamentally organised around two motivational systems, one defensive and one appetitive. Elaad (2009) does not contradict this idea either. Obviously, defensive motivation suits loyalty and field criminal examinations; appetitive motivation influences the responses during laboratory and demonstrative examinations. When creating an efficiency formula for polygraph examination, we have already taken the importance of motivation factor into account (Saldžiūnas and Kovalenka 2011). It is difficult to say theoretically whether the influence of a motivation factor will change at all during a polygraph examination. Obviously, the magnitude of the motivation of the guilty and innocent suspects will be different in the same criminal investigation. We believe (on the basis of our field examinations) that the motivation of the guilty examinee will be stronger and thus it will determine stronger recorded responses.

Significance. An attempt to account for the cases where stimulus change failed to produce an orientation was based on the notion that stimulus novelty in itself is insufficient for OR elicitation, and some level of significance is necessary (Ben-Shakar et al. 2000). Ben-Shakar notes that the definition of stimulus significance is relativistic for an individual. Suzuki et al. (2004) writes 'for each subject, a binary classification was applied to the questions terms of whether their relation to the crime was close or high (Hi), or less close or low (Lo). The *Hi* questions were directly related to the crime, and dealt with such issues as the nature of the crime, tools used in the crime, and the general locale where the crime was committed. The *Lo* questions were not closely related to the crime, and dealt with such issues as precise amounts of money involved, precise time when the crime was committed, colour of the robber's bag, and precise words that the victim spoke (Suzuki et al. 2004). Bradley (2009) also noted that stimulus significance may influence the magnitude of the recorded response. Significance may change in various ways during the examination depending on the test used; the magnitude of the recorded response will change respectively.

Fear. What is meant here is the examinee's pre-test fear. Ekman (1992) named five reasons why the examinee may feel fear before a polygraph examination. In their experiments Bradley et al. (2008) demonstrated that fear of pain is evidenced in psycho-physiological responses. We observed that in most field examinations.

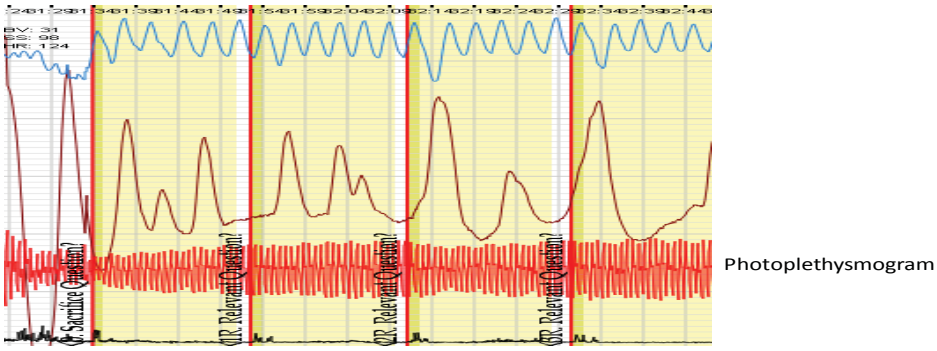

Figure 3. Field examination chart

It can be seen in Figure 3 that the response is reduced in the photoplethysmogram in the beginning of the test. Response magnitude of photoplethysmogram signal grows with time. This means (Krapohl 2010; Varlamov et al. 2010) that the examinee experiences higher stress in the beginning of the examination. The examinee's stress may change later depending on the situation.
It is one of the reasons why making the first question in CQT or the first item in CIT (first answer in EKT) relevant is not recommended (Varlamov et al. 2010). It may be thought that the initial fear of the polygraph examination and a response to it may decrease as shown in Figure 2. But that may be a very individual process which has not been well investigated yet.

Habituation. Ben-Shakar et al. (2000) wrote: the definition of the OR as a response to a change in stimulation implies that repeated presentation of the same stimulus would result in a gradual decline in response magnitude. Such a pattern was defined as habituation. In their experiments, Nakayama (2002) and Varlamov et al. (2010) demonstrated the way habituation reduces response magnitude during polygraph examinations. It is shown in Figure 2 that habituation reduces response magnitude as the duration of the examination is prolonged.

Fatigue. Fatigue may be physical, psychological or emotional. When the examinee fatigued during the examination, his or her state changes and the response magnitude decreases (E–F in Figure 1). Therefore, it is shown in Figure 2 that, as fatigue increases during the examination, the response magnitude decreases due to the fatigue factor.
The dependence of the relative response magnitude on the duration of the examination may be assessed in Figure 2. If we add the response magnitudes of all factors at the point t_1, we will obtain response magnitude $R(t_1)$:

$R(t_1)$ = R (novelty, t_1) + R (motivation, t_1) + R (significance, t_1) + R (fear, t_1) + R (habituation, t_1) + R (fatigue, t_1)
If we add up all response magnitudes in the point t_2 ($t_2 > t_1$), we will obtain response magnitude $R(t_2)$:
$R(t_2)$ = R (novelty, t_2) + R (motivation, t_2) + R (significance, t_2) + R (fear, t_2) + R (habituation, t_2) + R (fatigue, t_2).
In accordance with our model, when $t_2 > t_1$, it is $R(t_2) < R(t_1)$. This means that the longer the polygraph examination, the weaker responses are registered. This conclusion coincides with the conclusions of experimental works and our experience in field work.

Discussion

We will further review the way the magnitude of response changes when examining using Comparison Question Test, Concealed Information Test and Event Knowledge Test.

Comparison question test

Novelty. Assessing whether novelty influences the magnitude of relative response is very difficult. We believe that the influence of novelty will be minimal. The reasons thereof:

- The examiner introduces the questions to the examinee before the tests and discusses all nuances of each question with the examinee.
- The test is repeated from 3 to 5 times during the examination.

Motivation. Motivation does not depend on the type of the test.

Significance. There are no clear requirements regarding significance of relevant and comparison questions in the CQT. Significant and less significant questions may be freely administered in the tests. In accordance with the CQT concept, relevant questions must be more significant to the 'guilty' examinee, whereas comparison questions – to the 'innocent' one. As the tests are repeated from 3 to 5 times, significant and less significant questions are repeated throughout the examination.

Fear. Ex ante fear of the examination does not depend on the type of the test. As demonstration tests are also used in the examinations with CQT, it should reduce the magnitude of response of 'innocent' examinees, whereas it should increase the magnitude of response of the 'guilty' ones (Krapohl 2010).

Habituation. This should have a major influence to the magnitude of response, as the questions are introduced to the subject before the examination and the tests are repeated several times.

Fatigue. As the conversation, whose duration may last from one to several hours depending on the polygrapher's style, takes places before the test, the examinee may become tired still before the polygraph tests. In CQT, fatigue strongly reduces the magnitude of response.

The model assessing the influence of all factors on the relative magnitude of response in COT is shown in Figure 4.

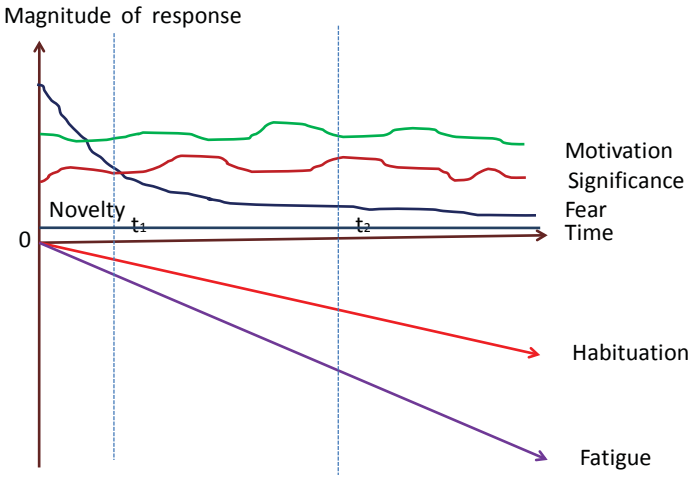

Figure 4. The model of the change of the examinee's magnitude of relative response during the polygraph examination for the CQT

Concealed information test

To clarify, the US (Krapohl et al. 2009), Japanese (Osugi 2011) and Russian (Kniazev et al. 2012) versions of the CIT are used.

The authors have examined all the factors and have found hardly any big differences, as all named factors influence the magnitude of response. Although the examiners from the Japanese police (Osugi 2011) note that the questions may be more and less relevant, we did not find their recommendations on how the questions of different relevance must be asked during an examination. The examiners of the Japanese police (Nakayama 2002; Osugi 2011) repeat the tests several times during the examination as well; therefore, the magnitude of response influenced by *significance* should decrease. It may be considered that the pre-test conversation before the CIT takes place for a shorter time than before the CQT. For this reason, the examinee's fatigue will have less impact on the magnitude of response. This means that the model of the change of the magnitude of response during the examination in case of the CIT will be very similar to the CQT model (Figure 4).

Event knowledge test

Novelty. The impact is great as:

- The question options are not introduced to the examinee before the examination (Saldžiūnas and Kovalenka 2008, 2009a, b, c, d).
- The questions are usually not repeated during the examination (Saldžiūnas and Kovalenka 2008, 2009a, b, c, d). Some answer options are repeated in exceptional cases.

Motivation. Motivation does not depend on the type of the test.

Significance. One of the main requirements in EKT tactics is that the questions are arranged from the least to the most significant one. It is only a trend in actual examinations, as the examiner's opinion that a certain question is the most significant may not coincide with the examinee's assessment.

Fear. Ex ante fear of the examination does not depend on the type of the test.

Habituation. It should reduce the magnitude of response significantly, as the questions are not introduced to the examinees before the tests and the questions are not repeated during the examination.

Fatigue. The procedure of the examination is briefly introduced to the examinee before the examination. This, in our opinion, does not increase fatigue strongly.
Having assessed the influence of all factors on the magnitude of relative response in the EKT, we present the relevant model in Figure 5.

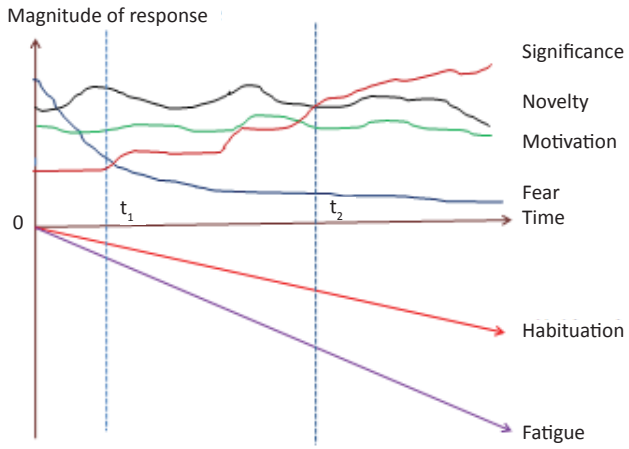

Figure 5. The model of the change of the examinee's magnitude of relative response during a polygraph examination for the EKT

It is now possible to compare the magnitude of response in the EKT and the magnitude of relative response in the CQT at a chosen time of t_2 on the basis of the model R (t_2, EKT) > R (t_2, CQT) presented here. On the basis of the model showing the change in the examinee's magnitude of relative response during the examination presented herein, it may be maintained that the magnitude of response in the EKT is higher than in the CQT and CIT. This assumption is confirmed by the field studies of the authors who have observed that general stress usually decreases in innocent subjects when examined according to the EKT. The stress of a guilty subject during the examination remains high or very high when resorting to the EKT (Saldžiūnas and Kovalenka 2008; 2009a, b, c, d). A potential problem of the EKT is that the very high levelof the subject's stress, which makes interpreting the charts very difficult.

Laboratory examination

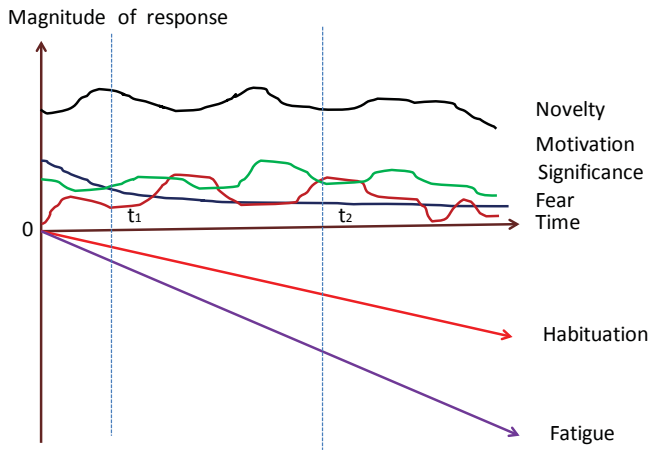

Figure 6. The model of the change of the examinee's magnitude of relative response during the laboratory polygraph examination

During a laboratory polygraph examination, the novelty factor will probably affect psychophysiological reactions much like in the field examination (Figure 6). We have already mentioned that effect of the motivation factor will be minimal during the laboratory examination. The examinee perceives laboratory examination as the gamble. Most likely, the effect of the significance factor will also be minimal during the laboratory examination. Before a polygraph examination, a subject may feel some agitation, but such a feeling will be significantly less intense than during a field examination. The authors are not aware of such scientific research, but we believe that habituation process should be more accelerated. The effect of the fatigue factor will probably only depend on physical characteristics of examinee.

To summarise, it may be said that the magnitude of relative response during laboratory examinations will be smaller than during field examinations. This model verifies our conclusions from earlier articles (Saldžiūnas and Kovalenka 2010).

Concluding remarks

1. Because novelty and significance factors increase psychophysiological reactions, we do not recommend repeating questions and we suggest selecting only the questions most important for the subject.
2. Polygraph examination should be organised rationally, and it should last as short as possible.
3. The model provided verifies that responses of examinees, who are not aware of details of the crime, are less intense than the responses of the guilty ones.
4. This model is suitable for field polygraph examinations (CQT, CIT, and EKT) and mock-crime examinations.
5. It could happen that after a re-examination (second or repeated examination) the results obtained by other examiners using the same questions for the same subject are not the same.

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A Theoretical Analysis of the Directed Lie Question (DLC)

Key words: Directed Lie Comparison (DLC), Probable Lie Comparison (PLC), CQT

The Directed Lie Comparison (DLC) question is being used in the field increasingly as some researchers have continuously suggested its use in a pedantic manner with statistical smoke and mirrors to replace the traditional Probable Lie Comparison (PLC) question.

The DLC is employed by basically informing the examinee that all people have done these things in their lifetime (lied, broke a traffic law, etc.) however, so the examiner can see exactly what happens physiologically when they lie they are to answer these questions "No."

The concept seems to have gained some support in governmental examinations because it is "politically correct," or because it alleviates the examiner from having

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to possess the ability to properly structure and introduce the PLC. The "politically correct" argument is that if an examiner is testing a superior he or she does not have to go into their actual life background to create a question, which may not be well received by the person of higher rank.

John Reid is credited with introducing the PLC in the 1940's. He defined it as a question broad in scope, similar but less severe than the target issue, and something that everyone has probably done however the examinee would not want to admit to it due to their present circumstances. Cleve Backster defined his theory of "psychological set" as the focusing of an examinee's mind on those questions in a format that hold the greatest immediate threat to their general wellbeing. Since 1980, we have taught "psychological set" as the focusing of the mind to those questions in the format that hold the greatest immediate threat or interest to the examinee. Recently some have named this concept "salience."

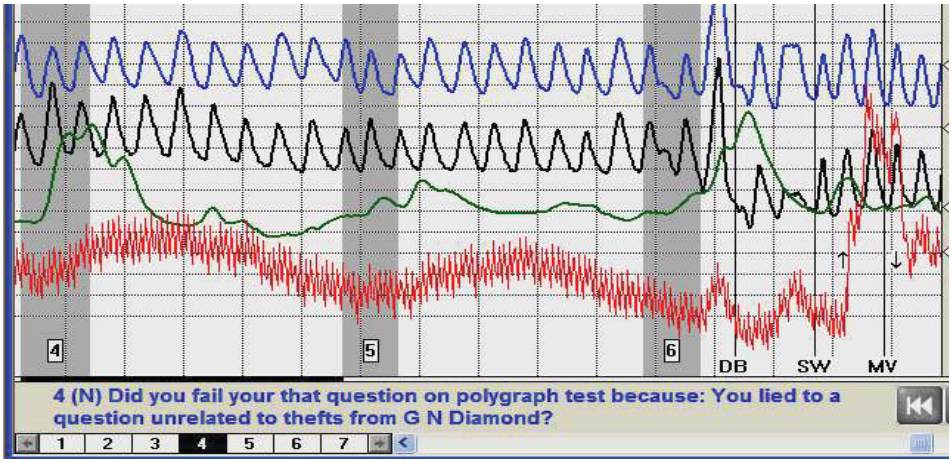
Backster stated that a polygraph test is a scientific test that monitors the examinee's flow of psychological set. If the examinee is innocent they will self-direct their focus to the PLC questions, and if guilty to the Relevant test questions.

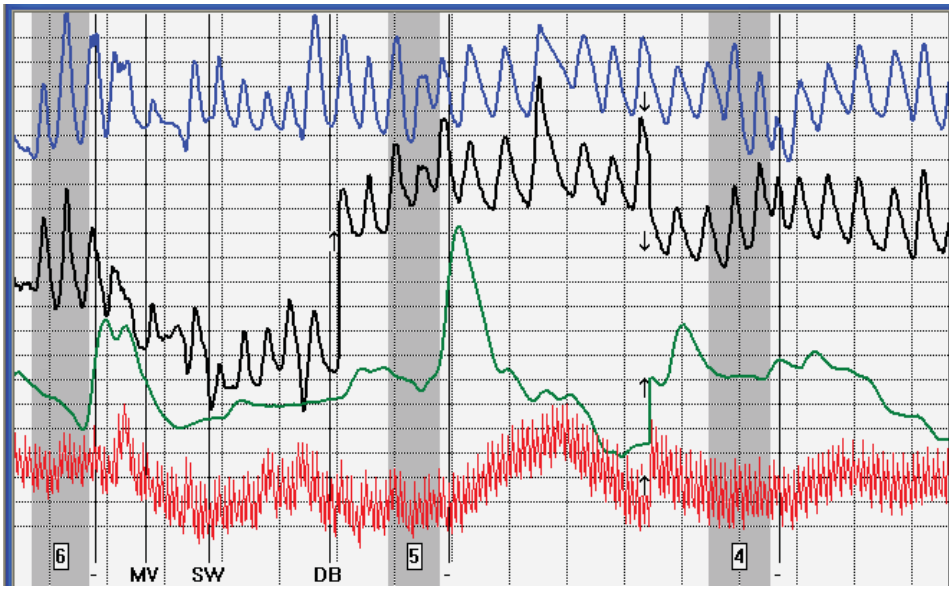
While the DLC may be politically correct and require less skill for the examiner to utilize, I fear it also creates False/Negative outcomes for several reasons, some of which were shared by Dr. Stanley Abrams (2001), and demonstrated in research by Matte and Reuss (1999).

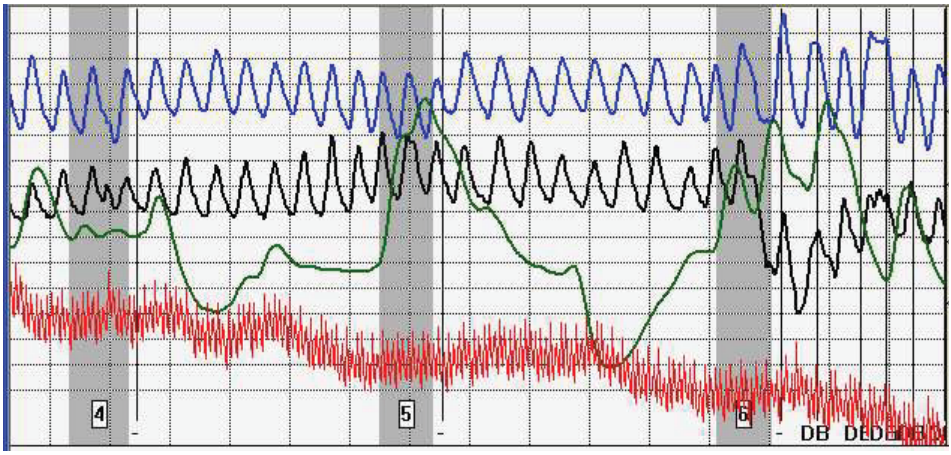
Problem 1: Introducing the DLC does not allow for the natural flow of "Psychological Set;" instead it creates a false focus to the DLC. If I tell you that what happens physiologically in your body to this question allows me to identify your body's reaction to deception, which I can then use to compare to the reactions in the Relevant questions and determine their veracity, then the DLC becomes the "KEY" to the revealing of the guilty examinee's involvement. Psychologically, the DLC, the KEY, can become more important than the Relevant test questions, resulting in False/Negative outcomes.

Problem 2: You do not have to be a "rocket scientist" to realize that if the reactions to the DLC are greater than those to the Relevant test questions you will pass the test. Interestingly, the researchers deny this, and yet they instruct examiners not to score respiration because it can be controlled by the examinee. Breathing is the effector and the EDA and Cardio are the affected. If we cannot trust the Pneumo component how can we trust what it affects? Once again we are looking at an increase in False/Negatives. Here are three charts with Relevant Question 5 enveloped by a PLC and

a DLC. Notice the deliberate distortions to the DLCs. Thus, the DLC invites countermeasures! The question now becomes who is better, the examinee at employing them, or the examiner and spotting them.







Perhaps the argument for the DLC should be that in a test that has a higher False/Positive rate, than False/Negative rate a procedure that reduces the former by creating more of the latter is a good solution. I may be behind the times, however, my goal as an examiner is to come to a proper conclusion, not create one type of error to compensate for another.

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Discussions, polemics

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Critique of Article by Nelson and Handler Entitled "Statistical Reference Distributions for Comparison Question Polygraphs"

Preface

This Critique was previously submitted to the Editor of the American Polygraph Association as a Letter-to-the-Editor consisting of 2046 words, two figures and 31 references challenging article by Raymond Nelson and Mark Handler entitled "Statistical Reference Distributions for Comparison Question Polygraphs" published in *Polygraph*, Volume 44, Number 1, 2015. The aforesaid Letter was rejected for publication in the Journal *Polygraph* by Handler, the newly appointed APA Editor who coincidently is co-author of the article being challenged by this author, citing APA's

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new guidelines limiting the length of a Letter-to-the-Editor to no more than 400 words, one table or figure and a maximum of 10 references.[1]

Critique

This Critique is in regards to Appendix P. Matte Quadri-Track Zone Comparison Technique, Page 114 of article entitled "Statistical Reference Distributions for Comparison Question Polygraphs" by Raymond Nelson and Mark Handler, published in *Polygraph*, Volume 44, Number 1, 2015.

In Footnote #9, Nelson and Handler, referring to the 2011 APA meta-analytic survey, stated "Studies supporting this technique have been described as substantially methodologically flawed, and it is considered unlikely that the reported accuracy rates will be achieved in field settings." The three field studies validating the Quadri-Track ZCT were in *field setting*s (Matte, Reuss 1989b; Mangan, Armitage, Adams 2008a; Shurany, Stein, Brand 2009), and the studies were not substantially flawed as indicated in this author's critique (Matte 2012). In fact, the aforesaid field studies met the most stringent requirements set forth in the *Guiding Principles and Benchmarks for the Conduct of Validity Studies of Psychophysiological Veracity Examinations Using the Polygraph* (Matte 2010), which require among other things a minimum sample of 50 confirmed cases (Matte 122, Mangan 140, Shurany 57). Conversely, the APA meta-analytic survey listed two studies validating the Utah ZCT Probable Lie Test, one of which was the Honts, Raskin, Kircher 1987 laboratory study that used a sample of only 20 cases; the Federal You-Phase (Empirical Scoring System) listed two studies, one of which was the Nelson, Handler, Blalock, Cushman 2012 field study (*Polygraph*, in press) that used a sample of 22 cases, and as of 6 January 2015, had not been published (R. Nelson, personal communication 6 January 2015), which raises serious questions about this study. Furthermore, the Utah ZCT Directed-Lie Test listed two studies, the Honts & Raskin 1988 field study with a sample of 25 cases, and Horowitz, Kircher, Honts, Raskin 1997 laboratory study with a sample of 30 cases. Sample size has a direct relationship to the applicability of the study's results to the general population. As explained in detail in the aforementioned *Guiding Principles and Benchmarks*, several important elements present in field studies are

1 Previous published Letters to the Editor published in *Polygraph*, namely Letter by Matte regarding Cushman's critique of the Matte Quadri-Track ZCT (MQTZT), Polygraph 43 (1), 2014, consisted of 6241 words and 35 references. Published Letter by Matte to the Editor regarding the APA's Terminology Reference for the Science of Psychophysiological Detection of Deception, *Polygraph*, Vol. 41, No. 4, 2012, consisted of 2224 words and 18 references. Published Letter by Matte to the Editor of the *Journal of Forensic Sciences*, Vol. 56, No. 6, Nov. 2011 regarding the Horvath & Palmatier Laboratory Study on the Exclusive v. Non-exclusive Control Questions, consisted of 4081 words with 31 references.

lacking in laboratory studies, which is beyond the scope of this critique. The United States Court of Appeals for the Sixth Circuit, U.S. v. Semrau, 693 F.3d 510 (6th Cir. 2012) in its rejection of the fMRI Lie Detection test placed particular emphasis on the fact that Dr. Laken's fMRI lie detection test was based on laboratory studies using mock scenarios and the existing technology had not been fully examined in "real world" settings (Matte 2013a). This opinion raises serious questions regarding the use of laboratory studies to validate polygraph techniques. Dr. Nancy Kanwisher, professor at the Massachusetts Institute of Technology (MIT), and Dr. Elizabeth Phelps, professor at New York University, shared their doubts in much detail (Matte 2013a) about the value of laboratory studies pertaining to lie detection and the directed-lie in chapter 2 of Bizzi Hyuman S.E., Raianchle M.E., Kanwisher N., Phelps E.A., Morse S.N., Sinnot-Armstrong W., Rakoff J.S., Greely H.T.G. (2009). See also (Matte, Reuss 1999; Matte 1998; Iacono 2001).

In order to conduct an accurate and unbiased evaluation of a study, it must include related published critique(s) which may expose significant errors and omissions that can impact on the validity of the study. Unfortunately, this author's published 25-page critique (Matte 2012) reporting serious errors and significant omissions in the 2011 meta-analytic survey was apparently ignored. Prior to publication of aforesaid critique, this author brought to the attention of the APA Research Committee a glaring error in the APA survey at footnote #40 which stated

"This statistic was published in the Matte and Reuss (1989) reprint of the dissertation published in the journal *Polygraph*, but cannot be located in the original dissertations study for the no longer extant Columbia Pacific University."

In fact, the 'statistic' that the committee couldn't find in the dissertation is located in the Table of Contents on page 3, and on pages 46–47 and Table 11, pages 99–100 of the dissertation (Matte, Reuss 1989a). On 12 January 2012, this author received a letter on APA letterhead from Mark Handler, acknowledging the error and promising publication of an errata in the journal *Polygraph*. No acknowledgment of aforesaid error or any of the other errors cited in this author's critique were ever published in any APA publication including the journal *Polygraph*.

All cited publications authored by Matte, including the aforementioned Critique and the 1989 dissertation and field study published in *Polygraph* are available for review and download at www.mattepolygraph.com under the Heading of *Publications by James Allan Matte and co-authors.*

In Footnote #10, Nelson, et al, stated "Published procedures for this Technique involve the average total score per chart instead of the more common grand total score. This will require the summation of all scores for all charts and division of the results

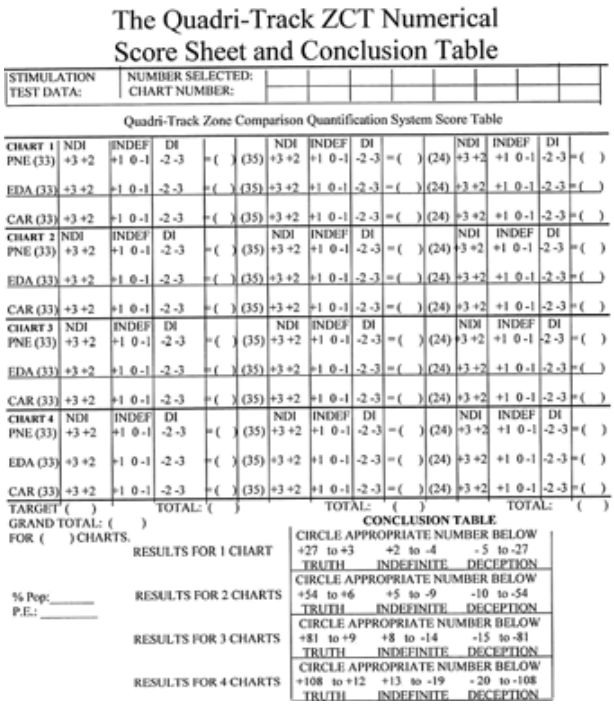
to the number of charts." This statement is inaccurate as reflected by the following descriptions of the Quadri-Track ZCT scoring system which marries the grand total score to a Conclusion Table offering a score threshold for each number of charts collected, supported by Predictive Tables for Estimating Error Rates published in Matte, Reuss 1989a.

A description of the scoring system in the Quadri-Track ZCT is set forth in article entitled "Psychological Aspects of the Quadri-Track Zone Comparison Technique and Attendant Benefits of its Inside-Track" published in *European Polygraph*, Volume 5, Number 2 (16), 2011, as follows:

"The scores attained from the comparison of the control versus relevant question in each track is tallied for a total score from the three tracks which is then married to a conclusion table that employs a score threshold based on a statistical predictive table for estimating error rates (Matte 1989a), to wit: +3 and -5 for 1 chart, +6 and -10 for 2 charts, +9 and -15 for 3 charts, +12 and -20 for 4 charts. A minimum of 2 charts must be used to arrive at a decision of truth or deception. Scores below the aforesaid threshold fall into the Inconclusive category." The score threshold for each chart collected is symmetrical in that the second chart doubles the threshold score of chart 1, the third chart triples the threshold score of chart 1, and the fourth chart quadruples the threshold score of chart 1, hence all four score thresholds bear the same potential error rate (0.0). It should be noted that in spite of the high score threshold, the inconclusive rate for the three published field studies that validated the Quadri-Track ZCT averaged 2.4%. In a recently published study (Matte 2013b), it was shown that as the score threshold increases, so does the accuracy, which prompted the use of a +3 score threshold rather than a +1 as indicated in the Probability Table 10a-2 inasmuch as they both reflected the same error rate (0.0) without an increase in Inconclusives, offering a more conservative and defensible position as explained on pages 42–43 (Matte 2014), which also references a study (Matte 2013b) revealing a connection between the score threshold, rate of inconclusives and minimum number of charts required for a decision of truth or deception.

A detailed description is further set forth in "Numerical Scoring Systems in the Triad of Matte Polygraph Techniques" published in *Polygraph*, Volume 28, Number 1, 1999, which states:

"Appendix 1 depicts the Matte Quadri-Track Zone Comparison Test structure which shows that the vertical score tallied from spots 1, 2, and 3 are combined for a total score inasmuch as all spots deal with the same single issue. Appendix 2 depicts the Tri-Spot Quantification System for the Quadri-Track ZCT, and Figure 3 shows the Conclusion Table from which a determination is made as to Truth, Indefinite (Inconclusive), or Deception from the total scores tallied from spots 1, 2, and 3."



The Quadri-Track ZCT Numerical Score Sheet and Conclusion Table

STIMULATION TEST DATA:	NUMBER SELECTED: CHART NUMBER:								

Quadri-Track Zone Comparison Quantification System Score Table

CHART 1	NDI	INDEF	DI				NDI	INDEF	DI				NDI	INDEF	DI			
PNE (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
EDA (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CAR (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CHART 2	NDI	INDEF	DI				NDI	INDEF	DI				NDI	INDEF	DI			
PNE (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
EDA (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CAR (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CHART 3	NDI	INDEF	DI				NDI	INDEF	DI				NDI	INDEF	DI			
PNE (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
EDA (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CAR (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CHART 4	NDI	INDEF	DI				NDI	INDEF	DI				NDI	INDEF	DI			
PNE (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
EDA (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
CAR (33)	+3 +2	+1 0 -1	-2 -3	= (	)	(35)	+3 +2	+1 0 -1	-2 -3	= (	)	(24)	+3 +2	+1 0 -1	-2 -3	= (	)	
TARGET ( )		TOTAL: ( )						TOTAL: ( )						TOTAL:		( )		

GRAND TOTAL: ( )
FOR ( ) CHARTS.

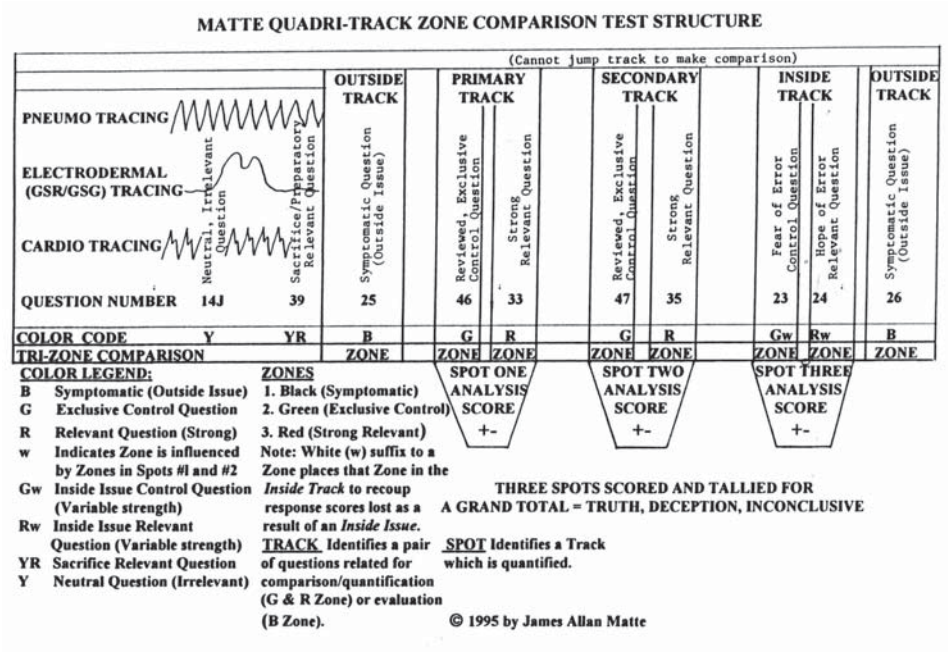
% Pop:_____
P.E.:_____

CONCLUSION TABLE

	CIRCLE APPROPRIATE NUMBER BELOW		
RESULTS FOR 1 CHART	+27 to +3	+2 to -4	- 5 to -27
	TRUTH	INDEFINITE	DECEPTION
RESULTS FOR 2 CHARTS	CIRCLE APPROPRIATE NUMBER BELOW		
	+54 to +6	+5 to -9	-10 to -54
	TRUTH	INDEFINITE	DECEPTION
RESULTS FOR 3 CHARTS	CIRCLE APPROPRIATE NUMBER BELOW		
	+81 to +9	+8 to -14	-15 to -81
	TRUTH	INDEFINITE	DECEPTION
RESULTS FOR 4 CHARTS	CIRCLE APPROPRIATE NUMBER BELOW		
	+108 to +12	+13 to -19	- 20 to -108
	TRUTH	INDEFINITE	DECEPTION

The total combined score is married to the related number of charts collected and score threshold in the Conclusion Table to determine test results. When the total score reaches the score threshold indicated by the number of charts collected, the potential error rate of 0.0 is attained as reflected in the Predictive Tables for Estimating Error Rates, Tables 10a-2 and 10b-2 (Matte 1989a). The total score is not averaged to render a decision of Truth, Deception or Inconclusive as stated by Nelson and Handler. The confusion may be due to the diagram depicted as Table 10-C in this author's doctoral dissertation which formed the basis for publication of the field study on the MQTZCT in *Polygraph* (Matte 1989b). Table 10-C depicted a graph using two bell curves that showed the relation between the polygraph score and the distribution of scores for the innocent and guilty cases, based on the average score per chart from Tables 10a-2 and 10b-2.

The following diagram taken from page 19 of field study by Mangan, Armitage and Adams 2008a) shown here in black &white, further reflects the use of the Total Score to arrive at a decision of Truth, Deception or Inconclusive.



The Integrated Zone Comparison Technique suffered the same description of its published studies as *substantially methodologically flawed* from Nelson, et al, which at the time the 2011 APA meta-analytic survey was published, numbered three studies, but since then has been augmented by two additional published studies. Due to the limited scope of this critique, this author will leave the defense of the IZCT to its able developer Nathan J. Gordon.

Poor technique formats that defy logic, common sense and empirical data cannot be rectified with statistical methodologies. When all the facts are known and understood, logic reveals itself. Further discussion regarding this topic will be forthcoming. In the meantime, Nelson, et al should end their unwarranted and divisive rhetoric towards the MQTCT and the IZCT which deserve their rightful place as high performance evidentiary techniques.

All of the aforementioned studies authored by Matte are available for review and download at www.mattepolygraph.com under the heading of *Publications by James Allan Matte and co-authors.*

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Letter to the Editor of European Polygraph

Dear Editor of European Polygraph,
Please accept my response to Mr. Matte's to European Polygraph regarding the Nelson and Handler (2015) article titled "Statistical Reference Distributions for Comparison Question Polygraphs."

My original response to Mr. Matte can be found in the journal Polygraph, where both the publication of interest and Mr. Matte's original letter to the editor were printed. I am a bit perplexed at the need to respond a second time to the same letter in a different journal. Much of the content of Mr. Matte's response is not new, has been printed elsewhere, and does not pertain to the article in question. Regardless, Mr. Matte can be expected to disagree verbosely with anyone who is skeptical about or disagrees with his proprietary conclusions and reported claims of ~100% test accuracy (Mr. Matte's published claims of 99.x% accuracy amount to what researchers might consider to be rounding error for conclusions of ~100%.) Because Mr. Matte has expanded his letter to the editor, I have expanded my response accordingly.

There are so many scientific and statistical errors in Mr. Matte's publications that it is difficult to know where to start. Mr. Matte's assertions, reliance on false hypothesis, gross misunderstanding of scientific principles and irresponsible statistical sugges-

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tions are so erroneous and so outrageous that they are likely to reinforce misperceptions that the polygraph itself is mere pseudoscience. Firstly, self-publication of a set of research guidelines does nothing to ensure the correctness or adequacy of those guidelines, and does nothing to rectify the flawed scientific methodology that lead to Mr. Matte's irresponsible claims of ~100% accuracy. Mr. Matte's assertion that sample size relates to the generalizability of conclusions is simply wrong. Sampling method does affect generalizability, and generalizable results can sometimes be obtained from small studies that make use of proper sampling methods. Generalizable results cannot be obtained from even large studies if the sampling methodology is flawed.

Mr. Matte's misunderstanding of the principles of psychology, physiology and scientific testing are evident in his continued convenient reliance on the false hypothesis of fear as the basis of the polygraph test, along with his false assumption of clairvoyance around the reason for the emotion of fear, and the false assumption that present day or historical polygraph recording devices can discriminate fear from other emotions such as anger, hope, disgust or joy or love. The evidence is abundant that fear is not a sufficient basis to understand responses to polygraph stimuli, and that the polygraph cannot discriminate between different emotions or their causes. (Despite these limitations, the polygraph has been shown to discriminate truth and deception at rates significantly greater than chance, though less than Mr. Matte's published claims of ~100% accuracy.)

Mr. Matte's misunderstanding of scientific research, and his views on laboratory and field studies, is plainly inconsistent with many decades of scientific research. Fundamentally, Mr. Matte appears to be confused about the difference between ecological validity and external validity. External validity – whether real world results are likely to be similar to the study results – has been shown to be not wholly contingent on the ecology of field studies. There are countless examples in every field of science and testing for which the results from laboratory studies have at times correlated well with results observed in real world settings. To suggest otherwise is to suggest that all laboratory research should be abandoned. A more realistic view would simply ask whether laboratory results do or do not agree with field study results. Additional questions might address whether laboratory or field study results are more likely to be incorrect when there is disagreement, and whether study results do or not agree with real world experience. An inherent limitation of field studies is that it is impossible to sufficiently control all variables to study research questions about causality. Although field studies can be used to study correlation, questions about causality can only be studied under controlled laboratory conditions. All types of research design can have some value and purpose. However, I do not believe that Mr. Matte's report-

ed claims of ~100% accuracy are consistent with real world experience, for which we can reasonably conclude there is some observable and measurable margin of error.

To illustrate how field studies and sampling methodology can lead to erroneous results that are not generalizable, consider an example in which a study sample is selected based on field cases that are confirmed by confession. This sample is at risk for selection bias because false-positive cases will be systematically excluded unless the innocent person makes a false confession. At the same time, false-negative errors will be systematically excluded unless a guilty person confesses after successfully passing a polygraph. It will then be no surprise that the result of this field study with a confession-confirmation sample will be ~100% accurate because the study sample includes no error cases. These results will not be generalizable and will not be observed in real-world settings. The conclusions from such as study are of no real value.

In the case of Mr. Matte's research, his reported "field study" results showing of ~100% accuracy prove nothing in reality and are not likely to ever be consistent with field accuracy. In reality, it would be naïve to expect to achieve ~100% deterministic perfection from a test of amorphous psychological and social phenomena, and it will lead only to frustration, aggravation and wholesale mistrust of the polygraph if polygraph professionals mislead the agencies, countries and communities we serve into believing they can somehow achieve certainty or perfection or the absence of decision all errors. Instead, it is the obligation of tests and testing professionals to develop and use replicable procedures to realistically quantify the margin of uncertainty and to constrain errors to within acceptable tolerances. Laboratory studies that have predicted polygraph accuracy rates at something less than perfection are far more likely to be consistent with reality that Mr. Matte's published claims of ~100% accuracy.

Because deterministic perfection is not likely to be observed in reality, it will likely lead only to frustrated expectations and frustrated responses from referring professionals and policy makers, along with cynical and skeptical responses from scientists if the polygraph profession were to take seriously Mr. Matte's published claims of ~100% accuracy. More importantly, members of the public are likely to feel harmed by the polygraph when they inevitably discover that the polygraph cannot provide certainty deterministic perfection, but serves only as a probabilistic test in the same what that every other scientific test provides a probabilistic measure of uncertainty surrounding a phenomena that cannot be subject to simple deterministic observation or direct physical measurement. Mr. Matte's published claims of ~100% accuracy therefore do not advance or benefit the polygraph profession, and in reality represent a liability for the profession and a hazard for agencies, communities and individuals.

Regarding Mr. Matte's objections to the Nelson and Handler (2015) article, we note that the table in Appendix P is calculated from the statistics published by Mr. Matte on page 98 of his 1998 study (co-authored with Mr. Reuss), which recommends cutscores of -5 and +3 per chart, and includes an instruction to average the scores for all charts in order to use these recommended cutscores. Mr. Matte's suggested cutscores for 2, 3 and 4 charts are linear multiples of the cutscores from his 1998 publication. More importantly, this illustrates another of Mr. Matte's scientific shortcomings. Every graduate student in every accredited university in the U.S. and every other country will learn that standard deviations – though they use the same unit of measurement as the data and mean scores – are not subject to linear addition, subtraction, multiplication or division in the same way as mean or average scores. Mr. Matte's use of simple linear multipliers for recommended cutscores – calculated from mean and standard deviations – is therefore mathematically and statistically incorrect. Mr. Matte's calculations and cutscores are actually incapable of informing us of the level of statistical significance of the test result. Although Mr. Matte's misunderstanding of science, research and statistics is well beyond the scope of what can be addressed in this letter, the correct procedure for this situation would involve the recalculation of cutscores at a desired level of significance after first squaring the standard deviation values before applying a linear multiplier for the number of charts and than once again taking the standard deviation as the square root of the multiplied statistic. Instead of attempting the seemingly impossible task of correcting his statistical and scientific misunderstandings we elected to simply recalculate the distributions from Mr. Matte's own published mean and standard deviations per chart, and to republish the formulations using Mr. Matte's recommended per chart cutscores – including the instruction to average the score for all charts – from the 1989 publication that he co-authored with Mr. Reuss.

In response to Mr. Matte's arguments in favor of the IZCT format, for which studies included in the APA (2011) report also concluded an essentially ~100% perfect accuracy level, it begins to appear that these responses may be motivated by mere vanity in response to detailed criticism of the scientific shortcomings of those published claims of ~100% accuracy. Although I cannot read minds any more effectively than Mr. Matte, it is my view that Mr. Matte and others are simply unhappy with a skeptical view of the published claims of achieving ~100% perfect accuracy (i.e., certainty). Although it may be interesting to ponder what motivation supports the publication of claims of ~100% accuracy or deterministic perfection, it would benefit readers more to focus the discussion strictly on whether the scientific and procedural assumptions are or are not sufficient to support Mr. Matte's reported conclusions. An even more productive effort would focus solely on realistically quantifying the probabilistic margins of uncertainty in the lie detection context. The core of the

issue is whether the reported conclusions of ~100% accuracy are realistic and replicatable by others. Most importantly, it would advance the profession more to discuss whether broader scientific and statistical principles do or do not concur with the assumptions and procedures employed in the research on the MQTZCT and IZCT formats. It is my position that Mr. Matte's assumptions, procedures and conclusions are not consistent with science, including psychology, physiology, test theory, information theory, statistical decision theory and other areas of science. Although other evidence does support the polygraph as highly accurate, field examiners throughout the world are not likely to achieve the ~100% perfect accuracy as claimed in publications on the MQTZCT and IZCT.

I do not know whether Mr. Matte and others do or do not actually believe in the published claims of ~100% accuracy using his technique. Mr. Matte is simultaneously the author of his eponymously named technique, the purveyor to the public and professional marketplace that may wish to engage in commercial transactions involving the technique, the "researcher" who published claims of ~100% accuracy, and also a participant in the data collection as testing examiner. As Mr. Matte's professional model is merely a complex extension of a *expert-practice* model (in which the effectiveness and validity of a technique is largely dependent on the persona, experience and expertise of the practitioner – and less reliant on the application of recognizable scientific psychology and test theory), his reported claims of ~100% accuracy, premised on a misunderstanding of the mathematics of statistical decision theory, amounts to little more than the publication of Mr. Matte's personal testament that he views his technique and perhaps himself in a superlative light. This has very little, if anything, to do with science, and does not benefit the profession in any way replicable scientific way. In contrast, an *evidence-based practice* model will emphasize the validity of a technique is supported not by personal prowess or wizardry but by the correct application of methods and procedures that have been shown to work at known level of effectiveness as function of the correct application of the principles of science.

I believe the scientific community will look with suspicion and concern at Mr. Matte's claimed results of ~100% accuracy, at his mis-understanding of statistical principles, at his deeply flawed research, and his idiosyncratic and proprietary psychological formulations involving the measurement and discrimination of the different emotions of fear and hope – something that the psychophysiological researchers have not yet achieved, and something that known to be inconsistent with the technological and recording capabilities of the polygraph instrument. Mr. Matte's psychological formulations are so inconsistent with the reality of scientific psychology that it can be regarded as nothing short of magic or divination or clairvoyance to suggest that

we can reliably discriminate the experience of fear and hope, or dissimulation and dishonesty in the expression of fear and hope, simply by asking questions about fear and hope while recording physiological responses with a device that cannot in reality discriminate or record any physiological differences between fear and hope. A cynical view would suggest that it appears to be an opportunistic insult to the public and to the intellect of the polygraph profession for Mr. Matte to expect others to endorse or accept his claims of ~100% lie detection accuracy regarding amorphous social and psychological phenomena (fear and hope) for which the polygraph cannot actually record and discriminate. I will leave it to readers to ponder for themselves what form of motivation prompts these unrealistic claims. The most important consideration at this time is this: who will benefit from the re-publication of Mr. Matte's assertions.

If Mr. Matte is correct, then perfect lie detection has already been achieved by Mr. Matte's divinations. Scientists need not apply, because there would be no need for any further research or publication. If Mr. Matte and others are incorrect – if ~100% lie detection accuracy has not yet been achieved and cannot be realistically expected in field settings – then Mr. Matte's publications advance us nothing and add nothing but confusion and noise to the professional knowledge base pertaining to the instrumental and scientific detection of deception.

Perhaps what is more important is whether the editors of European Polygraph will continue to provide Mr. Matte with a forum to inject confusion and misinformation into the professional and scientific literation on lie detection and polygraph. I believe the polygraph profession that will be better served by the publication of more generalizable and replicatable analysis from authors who are less interested in esoteric mysticism and proprietary vanity, and more familiar with the application of mainstream scientific and statistical concepts in the polygraph testing context. It would seem like an unfortunate failure of the editorial and scientific publication process to allow the continuation of this needless and noisy discussion to cause any further negative impact on the profession.

Reprinting of Mr. Matte's letter to the editor serves primarily to provide Mr. Matte an opportunity to republish his proprietary brand of impossible mind-reading, amateur psychologizing, and pseudoscientific ideas (i.e., ideas that purport to be scientific but are actually inconsistent with science). Reprinting of fictitious conclusions in support of previous publications claiming ~100% accuracy will do nothing in reality to advance the polygraph profession and may only lead to increased skepticism among scientists regarding the scientific competence of the polygraph profession. Additionally, re-publishing all or part of the same material might amount to what some academics and scientists would call self-plagiarism, which is a form of plagiarism that is viewed by some as ethically questionable. Reprinting of previously

published material may also bring into question the copyright ownership of the twice-printed material, for which editors generally require either permission from the original publisher or some declaration that the material has not already been previously published in whole or part in another location. At the very least, republication of Mr. Matte's unscientific critique and misapplication of the principles of science will amount a moment of vanity and an opportunity for Mr. Matte repeat himself, but it will ultimately and add only friction and confusion to the professional discussion. Most importantly, if the polygraph profession is to advance, it will be increasingly important to divest itself from unscientific ideas and unrealistic claims of ~100% accuracy supported only by the force of individual persona and verbosity, and not by a correct understanding of the principles of scientific research, or correct application of scientific theories from psychology, physiology, statistical decision theory and test theory.

June 30, 2015

* * *

From the Editor

Science thrives by exchanges of arguments and disputes, even if caustic. In principle, they are useful, should only the dispute be based on factual argumentation and not arguments *ad hominem*. We have decided to publish both the texts: criticism by James A. Matte and Raymond Nelson's reply. The arguments of both the challengers have now been presented to the readers of *European Polygraph*; here the argument ends, as we consider the subject exhausted.

The Editor

Book review

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Bartosz Wojciech Wojciechowski, Opiniowanie i psychologiczna analiza wyjaśnień [Literally: "Issuing opinions and psychological analysis of testimonies"] [in:] *Modele psychologicznego opiniowania w sprawach karnych, ed. D. Rode,*

Uniwersytet Śląski w Katowicach
– Gdańskie Wydawnictwo Psychologiczne,
Sopot 2015, pp. 355–381.

Attempts at psychological ąanalysis of testimonies and interviews are actually attempts at non-instrumental detection of deception. From the earliest days of the criminal procedure and interrogation, the interrogator has tried to assess whether the interrogated tells the truth, lies, or conceals certain facts. As early as nearly a century ago Edmond Locard, one of classics of European criminalistics, recommended that interrogators pay attention not only to the content of the statement(s) of the interrogated person, but also to the way how that person speaks, and what behaviours accompany the speech (including mimics and gestures). However, he believed that a correct reading of such behaviour is possible only when one knows well the psyche

of the interrogated: personality traits, experiences, etc. In this way, Locard suggested that the specific behaviour accompanying lie is individual, and everyone has his or her individual style of lie-accompanying behaviours.
Allowing to use behaviour to draw conclusions about the deception in utterance, establishment of the dependency between lie and behaviour is an interesting and important research problem in forensic psychology. In the recent years, the problem has been a subject of numerous studies, whose results are as interesting as encouraging.

Thus, besides polygraph studies, which (together with EEG and recently also fMRI and observation of facial temperature changes through infrared camera) can be counted among the instrumental methods of detection of deception, are developed in parallel to its non-instrumental methods of detection. These include both methods based on observation of lie accompanying behaviours (verbal and non-verbal, i.e. behavioural) and content analyses of statements. Beginning with the second half of the 20th century, the latter has been the subject of research among forensic psychologists, especially German (Udo Undeutsch, Friedrich Arntzen, Max Steller) and Swedish (Günter Trankell), and has focused predominantly on the testimonies of children witnesses (and victims) of sex crimes.

The reviewed study is devoted to this non-instrumental method of lie detection.

Statement analysis is an approach that is generally known today, and the best-known methods are Statement Validity Assessment (SVA) and Criteria-Based Content Analysis (CBCA).

In the recent years, methods of non-instrumental lie detection, especially those based on statement analysis, have been subject of plentiful research, also conducted by Polish forensic psychologists.

On the one hand, the reviewed work is a digest of studies in the area, ranging from Undeutsch to Vrij, and on the other presents the achievements of the Department of Clinical and Forensic Psychology of the Silesian University concerning creating a new model of testimony content analysis.

The first task has been performed meticulously, with the author synthetically presenting the entire applicable state of the art, and the presented bibliography sufficient to be considered exhaustive.

What raises certain doubts, however, is the proprietary concept of building a new Multivariable Adults' Statement Assessment Model (MASAM). The author states that the model uses, as one of the criteria of its assessment of testimony credibility (validity), the volume of such a testimony, amount of information shared by the

interrogated, and number of details, data, and descriptions (p. 375), which is to find its reflection among others in the length of the interrogation report made.

Yet, in contradiction of the author's belief, the volume and contents of a testimony as defined by the Polish Penal Procedure Code (Polish acronym KPK) depends to a large extent on the manner of interrogation, and the degree of the interrogator's attention and accuracy; and these are determined by the personality of the interrogator, his or her proficiency, familiarity with the case, etc. It is not so that the interrogated is allowed to speak at will. Thus, at least in Poland, it is impossible to distinguish clearly what the subject spontaneously revealed from what was provided as answers to the additional questions asked by the interrogator on the grounds of an interrogation report. It is so as the procedure does not require taking down the questions asked, and only the answers need recording. It also seems that the volume of the statement, and consequently the length of the interrogation report being its function, is to a degree determined by the personality of the testifying person. It is especially obvious that introverts are likely to speak less than extroverts, for which reason the criterion of volume must be contingent on the personality of the interrogated.

Briefly speaking, the use of such a criterion in assessing the validity of statement is at least doubtful in Polish conditions due to the report writing policy.

Two general remarks to close: first, generally denying or at best showing a largely reserved attitude to the scientific grounds of polygraph examinations, court psychologists believe that using their continuously improved non-instrumental methods of lie detection they are capable of obtaining results surpassing those achievable with polygraph examinations. This said, it must be remembered that the object of identification in content analysis methods differs from that of a polygraph examination. In the latter, depending on the technique used, the objective is to assess credibility (i.e. lack of deception) of a statement in an area defined by the test's critical questions, and even to assess credibility in answering individual test questions. The analysis of content of a statement leads to an assessment whether the entire statement is valid or not, without analysing which constituent sentences are true and which are not.

Secondly, as various works, especially by Vrij, suggest, the diagnostic value of all non-instrumental lie detection methods (including statement analysis) is far lower than that of a polygraph examination.

It seems incontestable that the two methods of detection of deception (i.e. instrumental and non-instrumental) are not competitive for each other and, on the contrary, they can be mutually complementary.

At the same time, it must be admitted that plenty of empirical studies have been devoted in the recent years to non-instrumental methods of detection of deception (experimental ones included); disproportionally more than to polygraph examinations. Little wonder that the progress of science in this area has been significant.

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For example (in references):

Reid J., Inbau F. (1966), *Truth and Deception: the Polygraph ("Lie-detector") Techniques*, Williams & Wilkins, Baltimore.

Abrams S. (1973), *Polygraph Validity and Reliability – a Review*, Journal of Forensic Sciences, 18, 4, 313.

and (Reid, Inbau, 1966), (Abrams, 1973) inside text.

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