

## Relevant Issue Gravity (RIG) Strength – a New Concept in PDD that Reframes the notion of Psychological Set and the Role of Attention in CQT Polygraph Examinations<sup>1</sup>

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### Abstract

The ideas presented in the article are based on the notion that the best way to detect people who lie to the relevant issue on the test, and differentiate them from those who are truthful in this regard, is to look for certain characteristics that are distributed differently in the populations of the “liars” and the “truth-tellers”, and measure their specific values in the examinees. According to the specific value found in the examinee, it is possible to deduce probabilistically whether the examinee belongs to the population of “liars” or “truth-tellers”.

There are reasons to believe that as a whole, those examinees who lie on the test in the relevant questions are attached psychologically to the relevant issue in a different way than the truth-tellers. An essential difference is the strength by which the suspect’s attention is directed, focused and bound to the relevant issue. These aspects of attention in the context of polygraph examination are coined, Relevant Issue Gravity (RIG) Strength, and it is not depended on the presented stimuli per-se, but rather on the internal state of mind that the examinee holds when arriving at the test and during its conductance. It is assumed to distribute differently among the liars in comparison to the truth-tellers and eventually affects the differential reactivity to the relevant vs. comparison questions. According to the Psychological Set theory, the differential reactivity is based on the notion that the examinee focuses on the particular issue or situation that presents the greatest threat to the legitimate security of him while filtering out lesser threats. However, in a regular specific case CQT examination, both the guilty and the innocent examinees start their journey in the relevant domain, and in order for the innocents to shift their attention and concerns to the domain of the comparison questions, they first have to detach themselves from the relevant domain. The easiness by which this diversion of attention occurs is heavily depended on the RIG strength that the examinees carry and the differential reactivity to the relevant vs. the comparison questions, in a way, signifies the value that they have on the RIG strength variable. Some supporting data and a few implications of this approach are presented and discussed.

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<sup>1</sup> Based on presentation at the APA annual seminar in New Orleans, August 2007

We all, polygraph professionals, hopefully know by now that the so-called “Pinocchio Effect”<sup>2</sup> (Carlo Collodi, 1883), does not exist in real life.

No guilty person is expected to expose his or her guilt by presenting a nose enlarging while lying. Nor should we expect to find any other unique characteristics that unequivocally always indicate the belonging of a person to either the “Guilty” or the “Innocent” populations. It is therefore, that we have to settle for a less distinct identification in separating liars from truth-tellers and concentrate on identifying characteristics that are distributed differently between these two populations, even though the two separate distributions are expected to overlap to a certain degree.

To clarify my point I would like to use a metaphor. Suppose we know that in a minute a man would step in our office. For some good reasons, we know for sure that this person is going to look as a typical (average) adult man of his country. We also know, ahead of seeing him that the person belongs either to the Vietnamese or the Netherlands nations. Having these two pieces of reliable information, one should expect that upon seeing the guy stepping to our office we would immediately recognize his nationality with 100% accuracy. That is because some of the physiognomies of a typical person of these two populations are different in a non-overlapping manner, and includes mutually exclusive characteristics.

Now, suppose that at the entrance of our office there is a semi-transparent curtain and the person will spend a few seconds beyond it, before stepping fully into the room. While standing beyond the curtain we expect to see a vague silhouette of him with no details. What are the odds that we will be able to spot his nationality at that point?

Contrary to what most people tend to think intuitively, the odds will still be 100% as long as the two pieces of information mentioned above, exist, and we know how to rely on them. The mean difference in height between men in these two populations is about 8” (Wikipedia, 2009), and since our reliable information says that with regards to his physical appearance the person is going to be a typical (average) man of his nation, it means that this difference in height will show up. This is a difference that it

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<sup>2</sup> “The Turquoise Fairy asks Pinocchio where the gold coins are. Pinocchio lies, saying he has lost them. As he tells this lie (and more) his nose begins to grow until it is so long he cannot turn around in the room. The Fairy explains to Pinocchio that it is his lies that are making his nose grow long, then calls in a flock of woodpeckers to chisel down his nose. “There are two kind of lies, lies with short legs and lies with long noses. Yours...happen to have long noses” (Wikipedia – Pinnocchio”, 2009)

is practically impossible not to notice even when all we can see is a vague contour of the person.

Now, let us take another step in this metaphor. Suppose the pieces of information we have are somewhat different. All we know is that lotteries were conducted in each of these two countries among all the adult male citizens, to win a prize that should be picked by the winners, one from each country, in our office today. We know that the first winner is about to enter our office, and of course he will be for sure either a Vietnamese or a Dutchman. Unfortunately, we are still having the situation in which we won't be able to see him clearly but rather only to watch his vague silhouette upon his arrival. What are the chances that we will be able to spot his nationality upon his entrance to our office while he is still beyond the curtain?

Assuming we only rely on the heights of these two gentlemen, we are facing a problem that can be solved only in probabilistic terms. We know that the difference in height between the two populations is about 8", but that reflects the average difference. For sure, the distributions of heights in these two countries overlap. So, all we can deduce from our basic knowledge is, for instance, that if we encountered an approximately 6'4" tall contour of a person, there is a very high probability that he is Dutchman rather than Vietnamese and vice versa if the contour is only of 5'4". The exact probability depends on the actual distributions of heights in these two countries, and the exact probabilities of the specific heights in each distribution. Thus, if we found that 20% of the male adult Dutchmen are 6'4" tall or higher, and only 2% of the Vietnamese are that high, we can predict with a probability of about 0.9 (90%)<sup>3</sup>, that behind the 6'4" person contour, stands a Netherlander.<sup>4</sup> Theoretically, we can never reach a 100% confidence because in each of the distributions, there are some individuals with very extreme heights, both ways. But, as a general rule, the higher the contour will be, the higher will be the probability that it is representing a Dutchman, and vice versa. That means that in the middle heights we might face equal probabilities for both nationalities. One can phrase it that the chances are the same for, let us say, a 5'10" contour to belong either to a relatively short Dutchman guy or relatively tall Vietnamese guy.

Let me just remind you that the reason for applying this probabilistic approach is our lack of having any clear cut, unequivocal, mutual exclusive information which can

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<sup>3</sup>  $20/22=0.909$ .

totally eliminate the possibility that the vaguely seen guy might related to either one of the populations. The approach that is applied in such situations is to look for some characteristics that are distributed differently in the relevant populations provided that their specific values or measures can be detected.

Figure 1 illustrates the essence of this approach with the “height metaphor”.

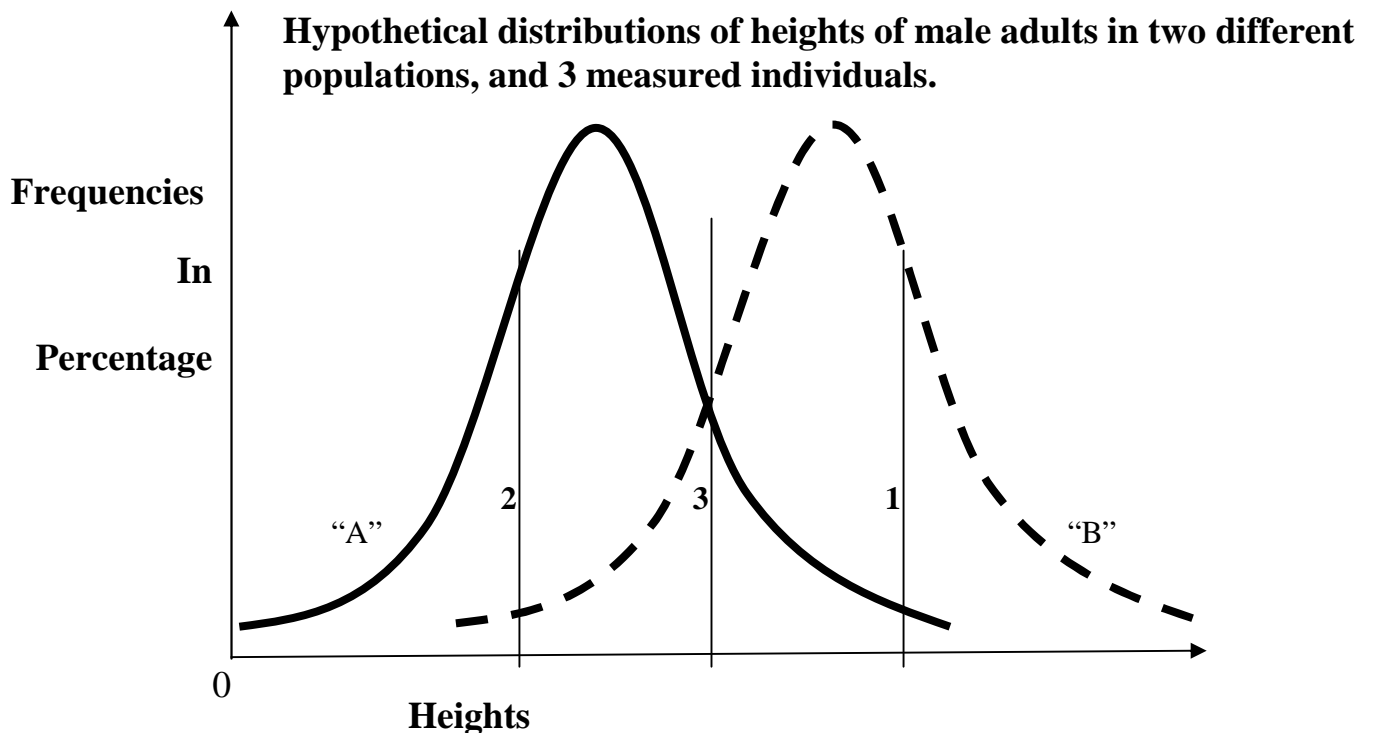


Figure 1 : The above figure demonstrates the possibility to make probabilistic inferences about each individual's belonging to one population or the other. Roughly speaking, there is a 90% chance that person number 1 belongs to population “B” and number 2 belongs to population “A”, while number 3 has 50% chances to belong to either one of them.

The reason I use this metaphor lays in the very fact that the task of correct identifying the nationality of the entering person represents in a way our task as polygraph examiners to decide whether an examinee is telling the truth or lies. Another way to put it is to say that our task is to identify whether the examinee belongs to the truth tellers' population or to the population of the liars (not as a personality trait but with regard to the relevant issues that are under inquiry). As long as “Pinocchio Effect” which might differentiate with no reservations between liars and truth tellers, exist only in fairy tales, the tactic that we must adopt is the same probabilistic tactic that has been presented above.

<sup>4</sup> I purposely do not want to get into the conditional probability issue since it is irrelevant to the metaphor.

Adopting this strategy means that we should look for one (or more) characteristic that its distribution in the Truth-tellers' population is different from what we believe to be its distribution in the population of Liars. Then we should have a way to measure the value that a certain examinee holds on this distribution and that will enable us to estimate the probability that this person belongs to the deceptive or the non-deceptive populations.

In the context of Psychophysiological Detection of Deception, a reasonable candidate for this role could be a certain aspect of Attention, (as a mental process or state of mind), namely, the strength in which the suspect's attention is directed, focused and bound to the relevant issue (e.g. the investigated crime). The dynamic behind this process assumes that the higher the intensity of this on-going preoccupation of the mind, (cognitively and emotionally), with the relevant issue, the stronger is the suspect's investment of attention and its various processes around the issue, leading to an increased focus on it, and in turn affect the preoccupation of the mind in a positive feedback loop. This positive feedback loop is a trap for attention and the attracting force that stands behind it, I would term the **“Relevant Issue's Gravity”**.

The regular examinee in a specific issue examinations<sup>5</sup> and in particular a naive one, whether guilty or innocent, arrives at the test knowing that the examination to be conducted on him/her, aimed to test his/her veracity with regard to involvement in the specific case which is under investigation. At this point, the examinee's internal attention is probably focused on the forthcoming examination and its possible consequences. Both the guilty and the innocent are busy consciously and pre-consciously in cognitive and emotional mental processes related to these apprehensions. They identify the relevant issue and the process of being questioned about it as posing a great threat for their well-being. It is frightening for both of them and probably resulting in mental preoccupation with this issue. This mental and emotional preoccupation involves much more than just the fear of the test's consequences, It contains also memories, images, a stream of associations, elevated motivations etc., and probably had started even before the option of polygraph test

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<sup>5</sup> At present only “classic” examinees are discussed i.e. suspects.

surfaced, because it is built on a non trivial event that the examinee has experienced, one way or another.

The strength of the so called “Relevant Issue’s Gravity” that indicates the degree to which the suspect’s attention is attracted to and stuck in the relevant issue, is a product of many circumstantial and personal factors. However there are good reasons to believe that it is distributed differently between the Truth-tellers and the Liars populations. On the average, it is hypothesized that the “Relevant Issue’s Gravity” for the Liars is stronger than it is for the Truth-tellers. For one reason for instance, it is because the Truth-tellers do not have any real memory about the investigated events. For them, it is but an abstract issue, a suspicion that probably endangers their well-being but still they have no real experience with the event, in contrast to the real memories that the liars have about the actual occurrences with which they deny having any involvement. This difference in memories is probably one of the most important factors in inducing the different distributions between the liars and the truth-tellers in the strength of the “Relevant Issue’s Gravity”.

Figure 2 presents the two assumed distributions of the “Relevant Issue’s Gravity” (“RIG”) in a similar manner that the heights distributions were presented in the aforementioned metaphor.

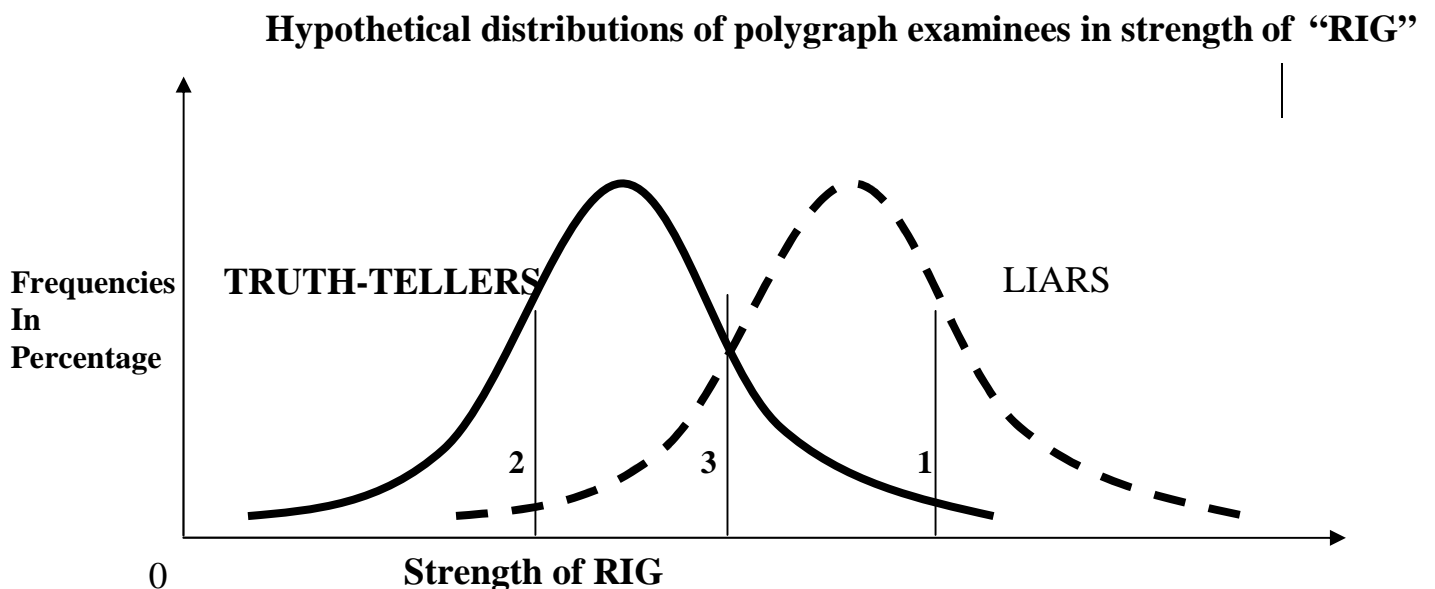


FIGURE 2: Hypothetical distributions of strength of “Relevant Issue’s Gravity” (“RIG”) in Truth-tellers and Liars, with values of 3 individuals. It is assumed that the RIG’s strength is higher for the population of liars and roughly speaking there are 90% chances that #1 is a Liar and #2 is a Truth-teller while #3 has equal chances to belong to either one of the populations.

Assuming that this hypothesis of different distributions of the strength of “Relevant Issue’s Gravity”(“RIG”) between the Truth-tellers and the Liars population is correct, we are still facing the need to find a way to measure the value on this characteristic for each examinee. If we find that an examinee is very high in RIG strength, we can conclude with a certain high probability that he/she belongs to the Liars population, and vice-versa for an examinee presenting a low value in RIG strength.

One way to measure RIG strength is to find how much it takes to distract the examinee’s attention away from the relevant issue. The harder it is, the stronger is the “RIG” that the examinee experiences and holds. This can be achieved by introducing “baits” to attract the attention of the examinee. The baits can take various forms with different levels of attraction, and within the set of the CQT polygraph examination it is introduced by the examiner in the form of what is known to be the comparison questions and the pretest interview that leads to their formulation (for overview of CQT see Raskin & Honts, 2002). Whether the baits were successful in attracting the examinee’s attention and divert it from the relevant issue to the issues covered by the comparison questions, is something to be found by comparing the examinee’s psychophysiological reactions to the relevant vs. the comparison questions, which indicate the relative salience of these two categories of questions for the examinee at that particular moment (Krapohl 2001). The higher is the success of these baits to attract the attention, the stronger will be the impact of the comparison questions and the psychophysiological reactions to them. It is not necessarily because they have gained more attention per-se, rather it can be because paying more attention resulting in increase of the salience of the stimuli or that attracting more attention indicates that the stimuli has become more salient due to the pre-test interaction. However one way or another, the success in gaining the examinee’s attention by the baits presented to him, and divert it from the relevant issue towards the comparison questions is positively correlates with the degree of impact that the comparison questions induce. It should be remembered that practically if the bait is big enough it might attract almost any person’s attention in almost any circumstances and if it is very weak it might fail in attracting the attention even in cases and circumstances that contain a very weak RIG. It is just a matter of dosage that a professional examiner must take into account.

How does the RIG strength concept relates to the concept of Psychological Set as applied in Polygraph theory?<sup>6</sup>

Psychological Set is a concept used in various fields of psychology (Matte and Grove, 2001). It closely resembles a state of mind of expectancy comprising a range of mental processes that characterized it. One can describe it as “Context-sensitive mental processes that follow a direction matching the assumed context.” (The Thinkerer web site, 2007) or as “Orientation or readiness for some kind of behavior” (Marx, M.H., 1976), or in another version “An adaptive preparedness to a certain kind of action or experience usually caused by instructions”, (Hilgard & Atkinson 1967, translated back from the Hebrew edition). A more general definition can be found in the Penguin Dictionary of Psychology (Reber 1995) –“Any condition, disposition or tendency on the part of an organism to respond in a particular manner. .... one may have an attentional or perceptual set for particular kinds of stimuli....”. The concept of “set” has been used in different areas and schools in psychology (not that much during the last twenty years), and therefore one may find more specific definitions which include different qualifier for prefixes such as: Perceptual Set - “A mental predisposition to perceive one thing and not another”; Mental Set –“ A tendency to approach a problem in a particular way...” (Myers, D.G., 1986); Sensory Set - “Preparation for a response by concentrating on perceiving the stimulus (signal) rather than making the response” (Marx, M.H.,1976). And so forth.

This state of mind or mental processes, positively affects perception and/or response to certain stimuli or issues (functioning as stimuli) at the expense of adversely affecting the perception and/or response to other stimuli or issues. At the risk of stretching its limits beyond the originally meant intentions, one can use the Psychological Set term to describe a psychological state of mind that has been set in the individual, based on his past experiences, to change the probability of perceiving

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<sup>6</sup> In the last few years a case has been presented against the use of the Psychological Set concept for explaining the theoretical basis of CQT and the rationale behind this technique (e.g. Honts, 2000; Krapohl, 2001; Handler and Nelson, 2007). However most of the critique was about the “unfortunate” using of this term in a different meaning that it has in Psychology, and only a little was dealt with its rationale. This article is not intended to address the first point, and the main ideas presented in it should not be affected by replacing the term Psychological Set with another term, more compatible with current psychology as long as it keeps the same rationale. Moreover, replacing the Psychological Set term by another term such as “Salience” or “Differential Salience” (as recommended by some of the critics) that presents a somewhat different rationale and supposedly explains a wider scope of aspects found in the polygraph arena, is irrelevant to the claims presented in this article.



certain stimuli or to react in a certain way in certain circumstances. It is a sort of selective attention built up, which is manifested by lowering the threshold for perceiving the consciously or pre-consciously expected cued stimuli and interpreting them within the assumed context, while at the same time raising the threshold for other stimuli or other possible contextual interpretations, resulting in ignoring them.<sup>7</sup>

While in most instances it helps the person in adapting to the environmental claims, the “Psychological Set” inherently contains a danger due to the mind’s ability to “see” what it’s expecting to see rather than what the senses actually sense.

Psychological Set is a general concept but its manifestation is always specific and relates to certain characteristics or circumstances that a person experiences or holds during a certain period of time. A pregnant woman, for instance, might notice other pregnant women on the street in a higher rate in comparison to her pre-pregnancy days because her special condition has set her psychological dynamics to be very sensitive in detecting cues that signify pregnancy. Similarly, the number of a certain car model perceived on the roads by a person who has just bought one, is probably changed, compared to his earlier perception. These are due to their specific psychological sets that have tuned their expectancies, with or without their awareness. The psychological set that a person who had been attacked by a dog, might have developed, won’t be the same as the one developed by a person who had been previously caught in a fire, although both of them relate to fears, anxieties and risks. Thus, it is clear that the exact psychological set is highly built on past experiences and each person has quite a few psychological sets in his arsenal. Then, in turn, according to the circumstances one of them takes over and becomes the active psychological set at that point. It is common to relate only to this active phase as a state in which one is

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<sup>7</sup> As pointed by Krapohl (2001), selective attention in psychological research is usually relates to situations in which a person who is exposed simultaneously to two or more stimuli tends to perceive and react to one stimulus and relatively ignores the rest of them due to some internal psychological factors. By so doing he indicates that at that specific constellation the attended stimulus is more salient to him than the others. When the stimuli are presented one at a time there is no clear competition between them to gain the attention yet one kind of stimuli might gets more attention than others, indicating its greater salience to the perceiver. This kind of “positive discrimination” can be assumed to occur partly due to similar internal psychological factors that affect the attachment of attention to stimuli in the simultaneous situation. Selection processes occur in simultaneous situations as well as in serial ones.

In a common paradigm used in set research, the subject is exposed simultaneously to two or more stimuli and demonstrates a selective attention performance related to his set. However the effect of lowering threshold to one kind of stimuli at the expense of raising the threshold to other kinds is demonstrated also in paradigms in which the stimuli are presented one at a time rather than parallel. (Woodworth & Schlosberg 1956).

under the influence of a specific Psychological Set while the other are in a dormant state.

Psychological Sets differ from each other not only by content or context but also by strength, and the stronger the active set is, the harder it is to distract a person from its influence. The strength of a psychological set can be changed by new experiences or circumstances, but it is also determined by the on-going internal mental processes that relate to the contextual issues. Up to a point, the higher the intensity of these internal processes the stronger is the psychological set. These include memories, thoughts, associations, emotions and motivations that build up the set and its strength.

Returning to the polygraph arena, the difference in direct experiences with regard to the issues under investigation clearly separates the liars from the truth-tellers. The formers have done the suspected actions or own suspected knowledge while the latter suspects have not. Even on this ground alone, their specific psychological sets with regard to the investigated issue must be different. If we could spot these differences directly, we would have a great tool to separate liars from truth tellers. However, this is not the case.

The Psychological Set theory of the CQT polygraph test that was first introduced to the field by Cleve Backster in the early Sixties of the previous century (Matte and Grove, 2001)<sup>8</sup>, states that:

“Psychological Set: Also known as selective attention, it is an adaptive psychophysiological response to fears, anxieties, and apprehensions with a selective focus on the particular issue or situation which presents the greatest threat to the legitimate security of the examinee while filtering out lesser threats.”

(Matte, 1996 – Forensic Psychophysiology using of the Polygraph)

The underneath assumption of this statement is that every single individual carries an endured and constant readiness to detect cues which signify threat to his well-being, and react to it. While this might be considered a necessary mechanism built in the organism for the sake of securing its existence, in itself it is not Psychological Set.

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<sup>8</sup> The readers are encouraged to read a debate about the role of “Psychological Set” in polygraph theory, between Matte & Grove and Krapohl, in POLYGRAPH,(2001), Vol 30, 3, Pp. 196-205.

The Psychological Set in this context is the product of the specific way in which this self-preservation mechanism has actually been pre set to function in every individual. Namely, based on his unique past experience and personality, what are the tendencies or dispositions that he holds? What kind of stimuli is he sensitive to, and what kind of reaction, they trigger in him for coping with the specific threat to his well-being on that specific occasion.

It is argued by Backster and his followers that above the individual differences there are main factors that separate between the guilty and the innocent examinees by affecting their Psychological Sets. According to this theory when going through a CQT examination, the relevant issue and the relevant questions pose for the liar the greatest threat to his well-being or self preservation, while it is the control (comparison) questions that are posing the greatest threat for the truth-tellers. In line with what has been said before, one can interpret this claim to say that the liars and the truth-tellers hold different specific psychological sets in accordance with their different experiences regarding the issues covered by the questions, and this difference is manifested through their identifying different sets of questions as posing the greatest threat for them.<sup>9</sup>

However, a close look at the process of polygraph examination reveals a difficulty in using this psychological set theory to fully explain the CQT dynamic.

As mentioned above, a naive examinee, whether guilty or innocent, in specific issue examinations, arrived at the test knowing that the examination to be conducted on him/her, aimed to test his/her involvement in the specific case, which is under investigation. At this point, the examinee's psychological set is focused on the relevant issue and both the guilty and the innocent are busy in cognitive and emotional mental processes related to this issue and the possible consequences of the examination. Both of them identify the relevant issue and the questioning about it as posing the greatest threat for their well-being. It is frightening for both of them and probably resulting in mental preoccupation with it. Both, the guilty and the innocents have an active psychological set related to the relevant issue. Thus, even though the Psychological Set theory might contribute a lot to understand the CQT rationale, the

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<sup>9</sup> To be more precise, the theory in its simplistic and in my opinion somewhat naive form, states that what is threatening the examinees is the possibility that their lies will be detected. Thus, since the truthful examinees supposedly lie only in the comparison questions they perceived these questions as posing the greatest danger to their well-being. While, for the deceptive examinees who lie to the

very fact that both the guilty and the innocent start their journey in the relevant field, needs to be addressed. That is because in order to realize that the comparison questions pose a threat as well, they must first be able to detach themselves from the relevant issue, or in a more general phrasing, in order for a person to reorient, they first would have to disengage, or to take attention away from where it is currently focusing. At this point, the “Relevant Issue’s Gravity” approach is taking its place. As mentioned above, the idea is that the Relevant Issue’s Gravity (RIG) strength tends to be stronger for the guilty examinees compared to the innocents, resulting in a relative difficulty to shift their attention from the relevant issues to the issues presented in the comparison question, while the innocents are relatively free to bite the baits presented to their attention by the comparison questions.<sup>10</sup> It is interesting to mention that on 2007 Offe & Offe have reported some findings that support the notion that the differential reactivity is achieved mainly through differential significance of the relevant questions only and not through the comparison questions. These findings are in line with the RIG strength hypothesis.

How much of the final scores or results can be attributed to the kind of selective attention process suggested by the Psychological Set Theory and how much is due to the “RIG”’s different distributions between the Liars and the Truth-tellers population, is not a simple case to answer but in support of the viability of the “RIG” approach, results of some minor unpublished researches and analysis of a few known facts in the field are presented herewith.

### **Time factor and crucial events along it**

This is something that many polygraph examiners know from experience. To the best of my knowledge it has never been tested scientifically in the polygraph area, but yet I believe it is a very reliable phenomenon, and we can use introspection to identify its existence.

It is a common knowledge and experience shared by most people that when something very significant occurs, we keep thinking about it and our mind is preoccupied with it. Then, with time, in most cases it fades away gradually. However,

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relevant questions, even though they are also lying to the comparison questions, the greatest threat is to be caught for lying on the relevant issue.

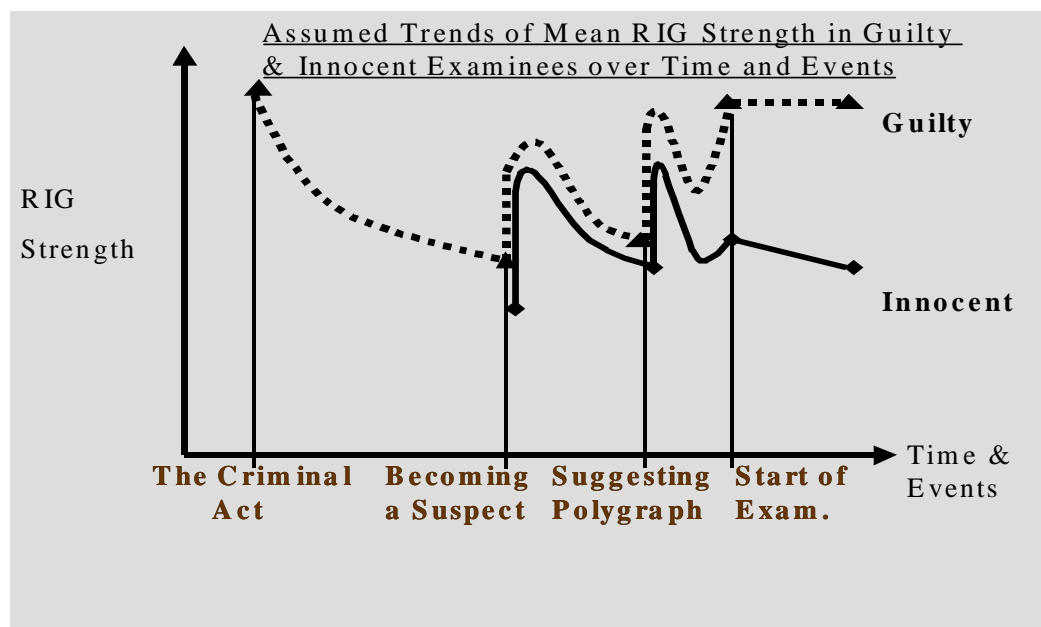
<sup>10</sup> It should be stressed that this is applied only to specific issues tests, or periodic tests that uses some version of CQT in which the examinees get to know before the exam takes place what are the issues they are about to be tested. That is not the case for pre-employment or other types of screening tests in which the issues and the questions are presented to the examinee for the first time at the pre-test interview.

if another significant event, related to the first one, takes place, there is a sharp increase in our mind's preoccupation with both of them, followed again by a gradual decline of their impact.

Now, what our experience as polygraph examiners tells many of us, is that if we polygraph examinees immediately after being involved with a significant event related to the investigation, they are prone to a higher rate of error and in particular FP. Therefore, we usually postpone the test by days or at least by hours before running the test. This observation led, for instance, in Israel Police Polygraph Section to adopt the general rule not to test an examinee in CQT on the same day that the criminal action took place, and not even on the same day that a polygraph examination was officially suggested to the suspect.<sup>11</sup>

This phenomenon is compatible with the RIG concept. Within the framework of the RIG concept, it is explained by the fluctuations and differentiations of the RIG strength in guilty or innocent examinees that occurs in time and with related events, as demonstrated in the following figure. Only when the difference in the assumed RIG strength between the guilty and the innocent predicts a safe gap, one can run a CQT polygraph examination with reasonable confidence that it will work without too many FP results.

**Figure 3**



### Polygraph examinations of victims

Another supportive point has to do with polygraphing victims. The rate of FP is known to be higher in examining victims in comparison to the usual FP rate (Ginton,1993,1997;Horwath 1977; Raskin 1986). This difference is compatible with the RIG strength hypothesis, which predicts it to occur due to the very fact that contrary to a “regular” examinee, it is the truth teller i.e. the real victim who tells the

<sup>11</sup> Internal Regulations and Guidance (1991 in Hebrew) – , Israel National Police, Scientific Interrogation Laboratory, Behavior Section, Division of Criminal Identification and Forensic Sciences. Written by Chief-Superintendent (at the time) Dr Avital Ginton and Major (at the time) Shmuel Zoltak

truth, that has the genuine memories from the investigated event and therefore, her/his RIG strength is higher compared to a fake victim. This higher strength of RIG causes difficulty in diverting the attention from the relevant issue to the comparison questions' domain.

**Possible effective use of bizarre comparative questions such as “Do you like blue in particular?” (Ginton,1982)**

More than 25 years ago, the Israel Police Polygraph Lab was involved for a few months in a serious investigation of an ongoing serial arsons case that kept the news' headlines busy. Almost 300 suspects were polygraphed throughout the investigation. As the head of the lab, when the number of examinees who have passed the test exceeded one hundred, and I got bored, I took the liberty to use the case for a small field study in which I compared various types of control (comparison) questions. I used a generic CQT technique with 3 relevant questions (primary involvement, secondary involvement and a knowledge, questions.). For control, I used one regular control question for arson cases, that related to past deeds of the examinees, one hypothetical control that related to the possibility of future mal deeds of the examinees and one bizarre control that was phrased as follows “Do you like blue in particular?” (Before I explain more about this “color” question, let me just add that in most cases, there was also a “suspect” question to control for the knowledge question).

Before the “color” question was introduced to the examinee I made an introductory remark as follows:

“ Look Ron, I am about to ask you a question now that might look a kind of bizarre to you. But believe me, it is a very important question, otherwise I would not waste my time to ask it. So, think very carefully before you answer me. – Do you like the color of blue in particular?”.

Now, regardless of the examinee's answer, the interview went on to discuss the “blue” issue for another few minutes, relating to his/her habits and personality traits and by so doing increased the salience of this question.

The formal decision for the criminal investigation was based only on comparing the relevant questions to the “regular” main control and the “suspect” control. There were about 25 examinees that went through this procedure. Most of them were called NDI and very few INC. The ground truth was that all of them were indeed innocents. What is important from the research perspective was that there were not real differences between the effects of the three control questions – the Regular, the Hypothetical and the Bizarre. Using any one of them gave quite similar results. In the serial arsons case, the phenomenon was demonstrated only with regards to innocent examinees, however later on, I used similar approach in a few small cases of various crimes, and got some DI results as well, when compared the relevant questions to the regular control. Here again the three types of control appeared to have similar effects. Unfortunately, in these extra cases the ground truth has never been established in any of them. This phenomenon is compatible with the RIG strength concept that expects the guilty examinees to be under a stronger influence of the RIG relatively to the innocents, and predicts the relative easiness by which the attention of the innocent examinees can be diverted away from the relevant issue by any kind of stimulation.<sup>12</sup>

<sup>12</sup> In this serial arsons case, there were two other forces that might have influenced the easiness of diverting attention away from the relevant issue. On one hand for most of the examinees, it was more

I believe that the success of the directed lie CQT technique is mainly based on the same phenomenon that was demonstrated in the “arsons case” study.

Non-critical/non-relevant items are better remembered by Innocent subjects compared to Guilty.

Additional support came from an unpublished laboratory experiment that I conducted about 20 years ago. The experiment was designed to test the hypothesis that when taking a polygraph examination, the attention of guilty subjects is focused and stuck in the relevant issue to a higher degree than the attention of the innocent subjects. This idea has been lately incorporated into the RIG concept.

It was predicted that a stronger RIG held by the guilty, would result in lowering the attention to the non-relevant stimuli and adversely affect their memory traces.

33 subjects were randomly assigned to Guilty (16) or Innocent (17) groups. All of them were instructed to go to a certain place outside the lab, and open a box, which contained 3 small items (a tea spoon, a pen, and a matchbox) and blank page. They had to write the name of the items on the page, fold it and hide it in their possessions. If they had been assigned to the Guilty group they also had to take and hide in their possessions the 3 items, while the innocent subjects were instructed to leave the items in the box.

Then, all of them had to take a “polygraph test to proof their innocence”, in the following procedure. They were attached to a polygraph, and a slide contained 20 scattered small items, each marked with a number (1-20), was presented to them. Three of the items were the relevant items from the box while the rest were non-relevant regular items. The same slide has been used for all subjects. When the slide was turned on the subject was asked, “ What item do you see in number 8?” and following his/her reply another question was asked “ Did you take this item with you?”. Then, the slide was turned off for a few seconds and turned on again with a new question “What item do you see in number 6?” and so on. This question set was repeated for 13 times with 13 different items, to include the 3 relevant items and 10 non-relevant. The polygraph set aimed to induce in the subjects an experience of being tested on a polygraph test but no real physiological analysis took place.

Three categories of items were shown in the slide on the “test” :

- A) Critical/Relevant “polygraphed” items – Items that were in the box, and asked about during the test. While in the box, all subjects saw them but only the Guilty group took them (3)<sup>13</sup>.
- B) Non-relevant “polygraphed” items – Items that all subjects were asked about in the test but no one saw them in the box or took them, and the first time they saw them was in the slide show during the test (10).
- C) Non-relevant “peripheral” items - Items that were not in the box, were shown in the slide but were not asked about during the test (7).

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of an elimination project with no real specific suspicious aimed at them, and psychologically this is resulted in lessening the anxiety that usually a sole suspect is carrying with him to the examination room. On the other hand the case was a very high profile case expecting to increase the examinees’ anxiety. Since they were expected to push to opposite directions, they are assumed to nullify their influence as a whole.

<sup>13</sup> The numbers in parentheses are the number of items in each category.

At the end of the 13<sup>th</sup> set of questions, the subjects were urged to recall as many items as they could remember from the slide show.

The items of the first category were obviously recalled by all subjects. The numbers of recalled items of the two other categories are presented in Table 1.

**Table 1 - Mean numbers of recalled items\***

	<b>Innocents n=17</b>	<b>Guilty n=16</b>	<b>t</b>	<b>df</b>	<b>Significance (two tailed)</b>
<b>Non-relevant “polygraphed” Items (10)</b>	<b>7.125 (71%)</b>	<b>5.29 (53%)</b>	<b>3.32</b>	<b>31</b>	<b>P&lt;0.01</b>
<b>Non-relevant “peripheral” items (7)</b>	<b>2.69 (38%)</b>	<b>2.59 (37%)</b>	<b>0.28</b>	<b>31</b>	<b>n.s.</b>
<b>Z (test for proportions)</b>	<b>2.80</b>	<b>1.33</b>			
<b>Significance – (two tailed)</b>	<b>P&lt;0.01</b>	<b>n.s.</b>			

\* From Ginton et al. (1986) -Unpublished research –Tel-Aviv University & Israel Police

It can be seen from the table that the Non-relevant items that had been specified by the questions and in a way resembled some characteristics of control questions have been recalled to a higher degree by the Innocents than by the Guilty subjects. That is compatible with the idea that the RIG strength is higher for the Guilty not to allow enough free attention to be directed to the non-relevant control items and increases their salience to the same degree as was established in the innocent subjects. This increase in salience is manifested by the difference between the percentage of the recalled Non-relevant “peripheral” items and the Non-relevant ‘polygraphed’ items, in both groups of subjects. Notice, however, that statistically a significant difference in this regard was found only in the Innocent group, which again supports the RIG notion. It should be clear that although the innocent examinees knew which items were stolen, they did not have the experience of taking them and hiding them in their possessions. No difference was found between the numbers of the “peripheral” items recalled by the subjects of the two groups. This reflects the basic ability to perceive and process stimuli to a certain level in a passive manner, even under significantly reduced attention, which considered to be an essential mechanism in implicit learning (Shanks, 2005). The predicted effect of the differential RIG strength is expected to show up mainly when some sort of an activity takes place to divert attention from the relevant issue to other domains.



Some concluding remarks

The Psychological Set Theory as presented by Backster and his successors, cannot ignore the fact that both the Guilty and the Innocent start their journey in the relevant field. It must accommodate to this fact.

Accepting the idea that a difference in the distributions of RIG strength between the populations of Liars and Truth-tellers, enables us to tell in probabilistic terms, whether a person belongs to one population or the other, given that we have a good way to measure his/her value on these distributions, implies that:

(a) CQT in its common format is but one option and other formats are plausible.

(b) The way by which the Comparison Questions are developed is more crucial than the content of the questions, the specific type of them or the kind of answers given to them.

(c) Various optional ways are plausible in trying to indicate the belongings of a person to the population of “liars” or “truth-tellers”, and different yardsticks to measure the RIG strength values are within a reaching distance. It should not be limited only to tests built upon questioning. There might be other methods to find how much it takes to divert the examinee’s attention away from the relevant issues, different kind of baits to attract attention, and perhaps other ways altogether to evaluate the strength of the RIG without using baits at all.

(d) Base on the same logic of looking for variable that are distributed differently between the population of “liars” and ‘truth-tellers”, we might find other variables besides the RIG and develop new tests or techniques compatible with them.

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