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Essentials of the Relevant Issue Gravity (RIG) Strength: A Theoretical Framework for Understanding the Comparison Question Test (CQT)

A detailed outline version

Сущность значения «Relevant Issue Gravity» (RIG): теоретические основы для понимания «Comparison Question Test» (CQT)

Key words: polygraph, deception detection, lie detection, Comparison Question Test, CQT, Relevant-Issue-Gravity, RIG

Abstract

The essentials of the Relevant Issue Gravity (RIG) theoretical framework for explaining the Comparison Question Test (CQT) (Ginton, 2009), is presented here in a detailed outline format. It is based on the notion that 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 atten-

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tion in the context of polygraph examinations are coined, Relevant Issue Gravity (RIG) Strength. The RIG strength is assumed to distribute differently between the liars and the truth-tellers. There is reason to believe that liars hold a stronger RIG compared to the truthful subjects, and eventually, that affects the differential reactivity to the relevant vs. comparison questions. The following describes the rationale behind the RIG concept, some supporting data, and the theoretical as well as practical implications.

Preface

In 2009 Avital Ginton published an article in *Polygraph*, the American Polygraph Association scientific journal, under the title:

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 – (POLYGRAPH, 2009, 38 (3)).

Over the years, the author has realized that there is a need to clarify, widen, and strengthen the RIG concept, and this is the aim of this paper. Since it is not clear how familiar the readers are with this concept and its rationale, the following presentation repeats some of the old stuff, including some basic material that helps to understand the context in which the RIG concept was developed.

Everything starts with the fact that although we would like very much to discern truth from falsehood, we have no reliable way to differentiate with no reservation or mistakes between liars and truthful people or detect the act of lying from telling the truth.

As Long As the “Pinocchio Effect”, which might differentiate with no reservations between liars and truth-tellers, exist only in fairy tales, the strategy that we must adopt is a **Probabilistic Approach**.

Two basic phenomena lie behind our search for a psychophysiological method of deception detection.

Fact 1 – People tend to react with phasic physiological changes when lying. This phenomenon stands behind almost any polygraph usage for lie detection.

Fact 2 – Many times, people react with similar phasic physiologically changes to questions posed to them also when they are not lying, and this stands behind the need to develop questioning methods based on comparing reactions to different questions. As very well known, in practice, the most common method that compares reactions to various questions is the **Comparison Questions Test**, the **CQT**.

In the **CQT** method, to make a call about the truthfulness of the examinee in a case under inquiry requires comparing responses to two kinds of questions: Relevant and Comparison. The basic premise suggests differentiation in the relative strength of reactions between these two categories of questions as follows:

- Deceptive Examinee $R > C$
- Truthful Examinee $C > R$

This is a basic premise of **CQT**, but by now, it is not only a premise but also a research-supported factual phenomenon (American Polygraph Association, 2011; Ginton, 2013; National Research Council, 2003; Raskin and Kircher, 2014). The observed phenomenon is that Deceptive subjects tend to react to the Relevant Questions with stronger reactions relative to their reactions to the Comparison Questions, and Truthful subjects tend to react in a reversed pattern. Thus, the differences in reactions' strength between the two types of questions distribute contrariwise in the two kinds of examinees, the Deceptive and the Truthful ones.

Understanding the CQT means first and foremost being able to explain the origin of this phenomenon, and my way to explain it starts by adopting a two-population paradigm.

The Two-Populations Paradigm in Polygraph Testing means that our task is to identify whether an examinee belongs to the truthful population or the population of the liars. (Not as a personality trait but concerning the relevant issues under inquiry).

Figure 1. Difference in Reactions Strength in two populations.

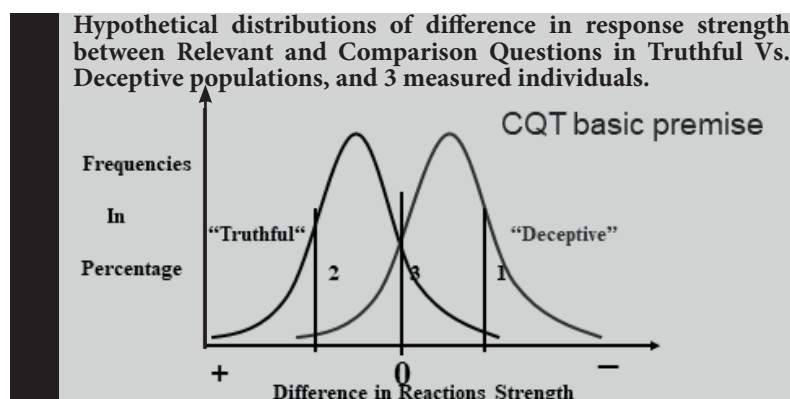


Figure 1: The above figure demonstrates the possibility to make probabilistic inferences about each individual's belonging to one population or the other. Roughly speaking, there is a 90% chance that person number 1 belongs to the RED population and number 2 belongs to the BLUE one, while number 3 has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

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 the Deceptive population, and number 2 belongs to the Truthful one, while number 3 has 50% chances to belong to either one of them.

Based on the two population approach, there are two different strategies to make progress: **A sheer empirical evidence-based and theoretical-based approaches.**

The Empirical Evidence-Based Approach is a purely observational driven attitude that is characterized mostly in the belief that unless something is proven scientifically, we should not treat it as something to rely upon and practically better to ignore it. It heavily depends on statistical theories and methods for examining observed phenomenon to the very fact of its actual existence but pays no direct attention to understand the essence of the phenomena.

The Empirical Evidence-Based Approach in its extreme manifestation totally Ignores the WHY; WHY certain phenomenon shows up? While Concentrating on the WHAT in the sense of "Can we trust that WHAT we get is a reliable phenomenon"?

Opting for the Evidence-Based strategy means concentrating on the Criterion Validity and the Accuracy Rate, as was manifested by conducting Monte-Carlo computations (e.g., Nelson&Handler,2008; Nelson, 2011; Raskin, Honts, Nelson & Handler 2015) and a variety of Meta-Analyses (e.g., American Polygraph Association, 2011; Honts, 2004; Kircher, Horowitz, & Raskin, 1988; National Research Council, 2003). However, this approach ignores the Construct Validity. Thus, even if we get very good results from these sophisticated statistical analyses, it might increase our confidence and, to a certain degree, direct our practice but would not advance our understanding of the CQT.

Some practical people would say that as long as this approach improves our practice, they do not really care about better understanding the CQT, let alone that many examiners are sure that the theoretical framework they were taught in their training is **God's Truth** or at least **Scientifically Good Truth. IS IT?**

The following presentation is not about evaluating the kind of evidence that the Empirical Evidence-Based Approach has relied upon in its important work to validate the polygraph tests, but it is clear that everything depends on the quality of these pieces of evidence and unfortunately, some world-leading scientists have questioned them (e.g., Iacono & Ben-Shakhar, 2019). Rather, the subsequent presentation is dedicated to the other strategy, namely, the Theoretical-Based Approach, which to my sorrow, its status is no better and in some senses, maybe even worse than the Empirical-Evidence-Based one.

The Theoretical-Based Approach. In contrast to the Evidence-Based Approach, the **Theoretical-Based approach deals, first and foremost, with the WHY question.**

WHY does a certain phenomenon exist? Not in the metaphysical, philosophical sense but from a scientific point of view?

Then come the questions of “WHAT” and “HOW”; WHAT causes the phenomenon, and HOW does it happen?

Adopting the Theoretical-Based Strategy, I decided to tap briefly on Four Basic Why Questions.

Four Basic WHY Questions

Why and What triggers the Autonomic Nervous System reactions?

- **Premise 1** – The function of the ANS is to increase the prospects of survival.
- **Premise 2** – This is done by keeping internal Homeostasis and reacting to current or anticipated significant changes in the external world.
- **Premise 3** – Two kinds of changes in the external world are relevant and may be significant to the survival of the organism – beneficial and detrimental.
- **Premise 4** – Facing such significant changes results in involuntary reactions of the ANS, aimed to adjust to the changes, and improve the chances to survive.

Why do people react with Autonomic Nervous System activity changes to Psychological stimuli?

- **Premise 1** – Other than pure physiological functions, attaching significance to stimuli is a psychological process, and most occurred or expected changes in the environment gain their significance from psychological functions and processes such as perception, memory, learning, feeling, etc.
- **Premise 2** – Two kinds of processes are involved in attaching significance to stimuli, Bottom-Up, and Top-Down. While Bottom-Up processes are mainly affected by the physical qualities of the stimuli, the Top-Down processes are driven by the individual state of mind and the psychological qualities of the stimuli.

Why do people respond with the Autonomic Nervous system when they Lie?

- During the years, several theories have been suggested to address this question. The following are some of them:
- **CONDITIONING** and other **LEARNING EXPERIENCES**.
- **INTERNAL CONFLICTS** – **COGNITIVE** and/or **MOTIVATIONAL**.
- **PERFORMANCE APPRAISAL APPREHENSION** – The accompanying tension of evaluating the success of the lying act to deceive.

- AROUSAL THEORIES (Increased cognitive arousal level) – OR; Vigilance; Meaningfulness; Salience; Cognitive load, etc.
- EMOTIONAL THEORIES – Fight, Flight or Freeze (FFF); Threat of potential exposure; Fear of consequences; Shame or embarrassment

Note 1 – The above are not necessarily mutually exclusive.

Note 2 – “Psychological set” targets the differential responses and not the mere response while lying.

And this my way to answer the question of why do people react with Autonomic Nervous system Changes when they Lie?

- **Premise 1** – The default in communication between people is transmitting the truth.
- **Premise 2** – Any act of communication that deviates from the default is a change that needs to be addressed by adjustment of the ANS activity, i.e., physiological reaction.
- **Premise 3** – Thus, in general, lying is a significant event that affects/changes the mind of both parties.
- **Premise 4** – Lying put the liar in a risky situation due to possible adverse rebound from the surroundings.
- **Premise 5** – All of the above are relevant to survival.
- **Premise 6** – Note however, that telling the truth might also be risky sometimes and certainly, significant on many occasions.

Let us turn to the forth WHY Question

Why do we witness the phenomenon that Deceptive Examinees tend to react to the Relevant questions with greater reactions than to the Comparison ones, whereas it is the opposite for the Truthful examinees?

- **Premise 1** – The reversed differential strength of reactions between Relevant and Comparison questions in Deceptive Vs. Truthful subjects depends primarily on the different states of mind between the two kinds of subjects that affects their perception of the questions as significant to their survival.
- **Premise 2** – There is a positive correlation, though far from being a perfect one, between the degree of salience and the importance of the stimuli to survival.
- **Premise 3** – For the Deceptive subjects, the relevant questions seem to be more salient/significant than the Comparison ones whereas, for the Truthful subjects, the relative salience order is reversed, though the “objective salience” stays the same for both groups.

OK, But Why?

While intuitively it seems logical to expect the deceptive subjects to perceive the Relevant questions to be more salient or more significant to their well-being than the Comparison questions, it is quite puzzling, why is the opposite hold for the truthful examinees?

Since it is not directly due to the act of lying (NRC, 2003; Vrij, 2008; Krapohl & Shaw, 2015), a rational way to look for the origin of this phenomenon is to identify related variables that it is sensible to expect them to form similar differential distribution in these two populations. Such similarity, if found, may point at a plausible origin of the reversed pattern of responses in Deceptive and Truthful examinees.

A reasonable candidate for this role may be “Attention” as a mental process or a state of mind and, in particular, the strength by which the suspect’s attention is directed, focused, and bound to the Relevant Issue at the expense of other issues or stimuli.

Upon arrival, and even before that, both the Guilty and the Innocent are busy consciously and pre-consciously in cognitive and emotional mental activity related to the Relevant Issue. It is frightening for both of them, and they are very much under its influence in a way that entraps their attention. This mental and emotional preoccupation with the forthcoming examination, regarding the relevant issues, involves much more than just the fear of the test’s possible consequences. It also contains memories, images, a stream of associations, elevated motivations, etc.

The higher the intensity of this on-going preoccupation of the mind (cognitively & emotionally), with the Relevant Issue, the more compelling the attention invested in it, which in turn increases the preoccupation of the mind in a positive feedback loop. The more you think about it, the more your attention is stuck in; the more your attention stuck in, the more you think about it.

It is a trap for attention resulting from what I’ve termed: The **Relevant Issue Gravity (RIG)**.

The more vital this on-going preoccupation of the mind, the higher the strength of the **RIG**.

The **Relevant Issue Gravity (RIG)** is a psychological force induced by aggregation of qualities that the relevant issue possesses, which attracts and binds the examinee’s attention to it.

This is the product of some general qualities that the relevant issue always possesses due to the very fact of being a relevant issue on the test, plus more specific, case-related characteristics, interacting with circumstantial and personal factors.

The journey of the examined person in polygraph testing always starts in the relevant sphere.

The relevant issue attracts and binds the attention of any normal examinee, whether deceptive or not, and as a by product causes considerable neglect of other issues or stimuli.

In order to pay attention to the comparison question one should first detach himself to a certain degree from the relevant sphere

The RIG strength indicates the degree to which the suspect's attention is attracted to and stuck in the relevant issues, and it is a product of many circumstantial and personal factors.

The RIG can take various levels of strength, and there are good reasons to assume that, on average, the RIG strength for the deceptive subjects is stronger than for the truthful ones.

A major reason for this relates to the existence or absence of relevant memories

In a regular case, Truth-tellers, have no episodic memory of the investigated event, since they were not involved with it. Contrary to that, Liars carry with them traces of memories and genuine emotions from their involvement in the actual occurrences.

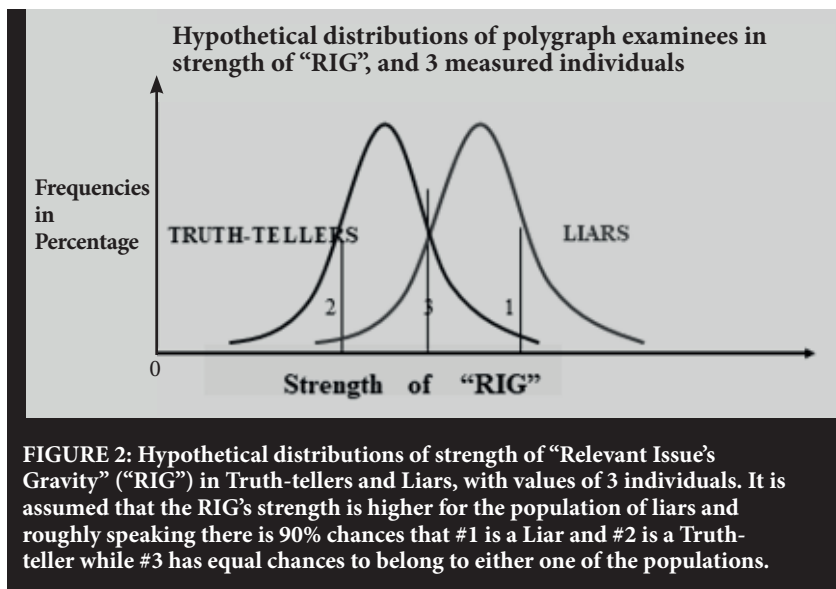
Other reasons for the Increased level of RIG in Deceptive Subjects:

- **The “Soft-Underbelly” factor** – The circumstances put the deceptive subjects in a situation in which their weakest and the most vulnerable point is by far the Relevant issue, resulting in a heightened self-focus on it and elevated RIG.
- **The Emotional factor** – On average deceptive subjects experience higher levels of emotions and motivations concerning their involvement with the relevant issue, and that increases the RIG strength for them.
- **The Cognitive factor** – Due to their effort to avoid detection, Deceptive subjects experience a higher cognitive load, which attracts their attention and binds it to the Relevant issue; thus, increases the RIG strength. The increased cognitive load when lying is spread from the actual act of lying to cover the whole situation in which a person has to keep his alertness to prevent exposure. This intensifies the RIG strength in the liars, resulting in less free resources for paying attention to the comparison questions or, for that matter, to any irrelevant stimuli”.

A few more words on the cognitive load factor

Deceptive subjects experience high Cognitive Load. The basic process of formulating a plausible lie may be cognitively difficult. Liars assuming that their credibility is suspected will monitor and attempt to control their appearance so that they appear truthful. Liars are also likely to monitor the examiner's reactions more carefully in order to assess their success in lying. Liars may focus on the task of acting and role – play as truthful. Moreover, liars must suppress the truth while they are lying, since speaking the truth often happens automatically. Finally, as compared to telling the truth, producing a lie is more intentional and deliberate and thus requires mental effort.

Under the two-populations-approach, the difference in RIG strength between the deceptive and truthful subjects is manifested in two different distributions of RIG strengths with some overlapping area, as shown in Figure 2.



Assuming the different distributions of RIG's strength between the Liars and the Truth-tellers, to assess the probability that a certain person in a certain circumstance belongs to one distribution or the other, one needs to find a way to measure the RIG's strength value for the examinee.

One way to measure the strength of the RIG for a certain suspect is to find, how much does it takes to distract the examinee's attention away from the relevant issue. The harder it is, the stronger the RIG that the examinee holds.

This shift or change in focus can be achieved by introducing baits to attract the attention of the examinee.

In principle, the baits can take various forms with different levels of attractions.

Within the set of polygraph examinations, the baits are 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. Since the RIG strength for deceptive subjects is high, it is hard to detach their attention from the relevant issue sphere and shift it to the comparison one, while it is much easier to succeed in this with truthful examinees whose RIG strength is weaker.

The most important task the polygraph examiner has in the CQT is managing the diversion of the truthful examinee's attention from the relevant sphere to the comparison ones with minimum effect on the deceptive examinees. A matter which is impossible to standardize without giving room to the existing variability among cases.

Whether the baits were successful in attracting the examinee's attention and divert it from the Relevant Issues to the issues covered by the Comparison Questions, is something to be found by comparing between the psychophysiological responses to the Relevant and the Comparison Questions.

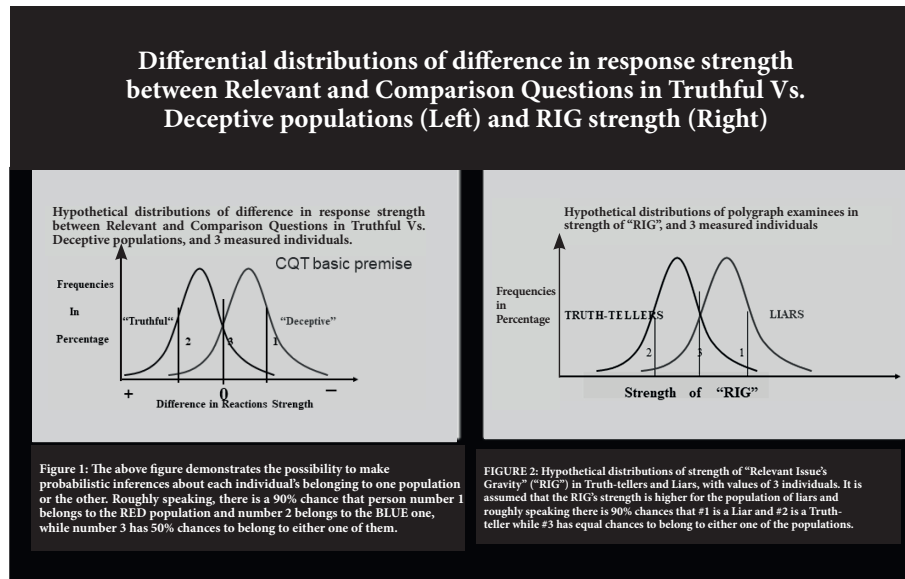
The higher the success of these baits to attract the attention, the stronger will be the impact of the comparison questions and the psychophysiological reactions to them.

According to the RIG strength theory, stronger reactions to the comparison questions indicates a lower level of RIG strength and, therefore, a higher probability that the examinee belongs to the truth-tellers distribution, i.e., he/she is probably a truthful subject and vice versa.

Note however, that if the baits are too big/strong, they might attract almost any person's attention and shift it to the comparison sphere in almost any circumstances. The opposite holds for too small or too weak baits that might fail to attract attention at all. It is just a matter of dosage that a professional examiner must take into account, and the preferred dosage of the Attention-Attracting-Baits should follow the Goldilocks Principle.

Before getting into the Goldilock Principle, let us have a look at the association between the RIG strength proposition and the basic premise of the CQT, which is manifested in the following illustration:

Figure 3. Similarity between the distributions of Response strength in CQT and RIG Strength



The distribution of the observed phenomenon in CQT that Deceptive subjects tend to respond to the Relevant Questions with stronger reactions relative to their responses to the Comparison Questions, and Truthful subjects tend to react in a reversed pattern looks similar to the expected hypothetical distributions of RIG strength.

Back to the Goldilocks principle. It is derived from a children's story "The Three Bears" in which a little girl named Goldilocks finds a house owned by three bears. Each bear has its own preference for food, beds, etc. After testing each of the three items, Goldilocks determines that one of them is always too much in one extreme, one is too much in the opposite extreme, and one is "just right".

Whatever the polygraph case is, this principle stays the same, but the actual values of the "just right" level of the attention-attracting-baits must be changed to fit the individual subject and the specific circumstances.

Not adjusting the size or the degree of the baits to the case means discarding the real meaning of the Goldilocks Principle.

The wise meaning of the Goldilocks principle for CQT

- “Too strong” or “Too weak” baits are not fixed objective values, but rather case-dependent matters, and so is the “Just Right.”
- The examiner should adjust the size or the degree of the baits to the case.
- The difference between typical and great examiners lies in their capability to master this delicate matter.
- “One size fits all or else we lose standardization”, is the motto of the Evidence-Based devotees in our profession, who, in the name of science, worship zealously the strict standardization that prevents chaos but also adversely affects flexibility and creativity. That means that one should not play with the amount or level of the Attention-Attracting-Baits from case to case, from one examinee to another.

Conversely, in line with the RIG strength rationale, it is recommended not be satisfied in following the Evidence-Based standardization blindly but rather keep some flexibility and invest in deepening our understanding of the CQT by asking “WHY”, developing new hypotheses, try them and put them into objective tests by unbiased open-minded researchers.

RIG and the Case of the Screening Tests

Many times for the truthful subjects in screening tests, there is no RIG at all since they can not identify any specific outstanding relevant issue, whereas the deceptive subjects identify their own relevant topic/s spontaneously and develop the RIG to them. For the truthful subject, in this case, we might say that there is a pseudo general RIG that revolves around passing or failing the test as a whole.

In some circumstances, when it is clear to the subjects that a certain issue is outstanding in its importance, a specific RIG can be developed around it also for truthful subjects.

Essentials of the RIG Construct and its Dynamic Role in CQT

1. The journey of the examined person in polygraph testing always starts in the relevant sphere.
2. The relevant issue attracts and binds the attention of any normal examinee, whether deceptive or not, and as a byproduct causes considerable neglect of other issues or stimuli.
3. In order to pay attention to the comparison question one should first detach himself to a certain degree from the relevant sphere.
4. The psychological force generating the attraction to the relevant issue was termed by me “Relevant Issue Gravity” (RIG).

5. The RIG is the product of some general qualities that the relevant issue always possesses due to the very fact of being a relevant issue on the test, plus more specific, case-related characteristics, interacting with circumstantial and personal factors.
6. The RIG's strength indicates the degree to which the suspect's attention is attracted to and stuck in the relevant issues, and it is the product of many circumstantial and personal factors.
7. There are good reasons to assume that, on average, the RIG strength for the deceptive subjects is stronger than for the truthful ones.
8. It is more difficult to detach deceptive examinees from the relevant issue and divert their attention to the comparison questions due to their stronger RIG effect and vice versa.
9. The attempt to divert the attention from the relevant sphere to the comparison one is done by the dynamic of formulating and introducing the comparison questions to the subject.
10. The degree of success in diverting the attention from the relevant sphere to the comparison one is manifested in the difference between the strength of the physiological responses* to the two categories of questions.
11. Success in diverting the attention indicates relatively weak RIG which characterizes a truthful subject and vice versa.

Figure 4. The RIG construct and its dynamic role in CQT



* The origin of the ANS responses and general activity are fundamental living mechanisms "designed" to increase the prospect of survival

Since we assume that it is not the mere act of lying that produces the reversed pattern of reactions strength between Relevant and Comparison Questions in the two populations, the RIG strength is introduced as the missing link that explains this phenomenon.

Some Operational and Empirical Supports for the RIG Strength Theoretical Framework

- The need for having a reasonable time gap between the occurrence of the investigated events or the suspect's interrogation and the CQT test. Otherwise, the RIG is too strong for any examinee and produces Ceiling Effect, which interferes with the differentiation.
- It explains the success of the DLC which functions as a compatible bait for diverting attention from the relevant issue to the comparison sphere.
- Testing alleged victim – High rate of errors due to strong RIG for the truthful victim who carries traces of episodic memories from the event and relatively weak RIG for Deceptive examinee who does not have that memory traces (Horvath, 1977, Ginton, 2013).
- A higher proportion of FP in heavy criminal offenses compared to weak offenses (Elaad & Shterzer, 1985) – Explained by the difference in RIG strengths.
- The bizarre “Blue question” (Ginton, 2016) – Successful bait for diverting attention from the Relevant sphere to the Comparison one without using lie questions.

A word on the bizarre “Blue question” (Ginton, 2016)

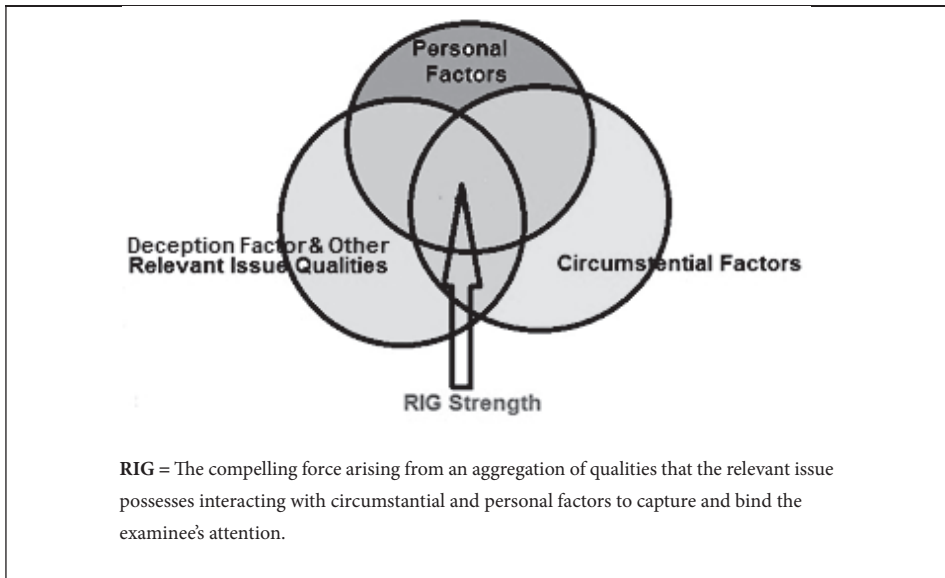
- In a serial arsons case back in the 1980s, I used next to conventional comparison questions also the following one: “Do you like Blue Color in particular?”. However, before I introduced the question, I made the following introductory remark:

“Look Ron; I am about to ask you a question that might look a kind of bizarre to you. But, believe me, it is a highly important question; otherwise, I would not waste my time asking it. So, think very carefully before you answer me, – Do you like the blue color 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. In case the examinee answered that blue is his favorite color, the examiner asked him whether he

considered his attraction to blue to be abnormal or pathological in its nature. The final phrasing of the question was in accordance with this conversation, aiming to get a “NO” answer. Thus, either it was “Do you like the color of blue in particular?” or “Do you consider your attraction to blue to be abnormal?” and eventually, the chosen answer by the examinees was always “NO”. All of them turned out to be truthful subjects, as the real arsonist was caught. The point is that this question was as effective as the more conventional ones in indicating True NDI.

It should be stressed that the Deception Factor is not the only factor affecting the strength of the RIG, and there are a variety of personal and circumstantial factors that also affect it, as shown in the following illustration:

Figure 5. Factors affecting the RIG strength



We should be aware of the existence of such factors in each case, and when we encountered a heavy loaded factor in a certain case, we must not ignore it in the name of objectivity and standardization, rather we should relate to it and adjust the pretest interview to suit that specific situation.

In particular, we should maneuver the level or the size of the bait that we are presenting in our effort to divert the examinee's attention from the relevant to the comparison sphere. That is to say, that the examiner should play with the amount of emphasis we/she put on the Comparison vs. the Relevant questions to balance the assumed effect of the identified extra factor on the RIG strength. In fact, this is the meaning of how to use the Goldilocks principle wisely, in presenting the "Just Right" bait for optimizing the CQT outcomes.

This might be a seed for developing in the polygraph profession a scientific-based approach that does not refer to all sorts of variability as something to ignore or "fix" statistically as if it were noise. Rather, variability should be recognized as a phenomenon that has to be treated with what I have termed "ADAPTIVE POLYGRAPHY", in which the polygraph testing procedures and dynamic will not be "one size fits all" but "Different Things to Different People and Different Circumstances".

Examples of Factors other than Lying Vs. Telling the Truth, that might affect the RIG strength

Issue's Factors

- Severity in terms of formal consequences (e.g., the expected punishment)
- Objective Emotional loads (e.g., minor sexual offense Vs. minor theft)
- Personal Factors
- Personality type or traits (e.g., Obsessive Vs. Scatterbrained)
- Previous criminal experience
- Previous polygraph experience
- Social status (e.g., a teacher Vs. a mechanic; celebrity Vs. "no-body")

Circumstantial Factors

- Strength of Existing evidence
- Depth and length of prior interrogation
- Public profile of the case (e.g., no one heard about Vs. daily headlines)

Concrete examples

- Alleged victim case
- Witness to a traumatic event
- Recidivist criminal
- High profile case
- Reexamination

- ADD/ADHD –Attention Deficit (Hyperactive) Disorder
- OCD subjects

For several decades, the theoretical framework for CQT suggested by Cleve Backster in the Sixty's – **The Psychological Set** – was almost the sole theory of CQT in the field of polygraph practice. In the last decade or so, several other theoretical frameworks have been suggested and spread among the polygraph examiners and researchers.

Proposed Theoretical Frameworks to the CQT

- Psychological Set
- Differential salience
- Relevant Issue Gravity – RIG strength
- Preliminary Process
- Cognitive Load

This article is dedicated to the RIG strength theory, but it is worth to say a few words about the others.

A Note on Psychological Set and Survival Mechanisms

- The tendency to approach beneficial stimuli or options and avoid detrimental ones is not a psychological set but rather an innate, instinctual underlying mechanism of survival. Examples of such tendencies include responding to a good or bad smell, responding to sexually arousing stimuli and responding to dangerous situations.
- In psychology, the term Set mostly relates to an acquired, context-sensitive tendency or readiness (sometimes built upon pre-wired mechanisms), to perceive or act in a certain way. In its active state, it may serve the basic survival mechanisms but not limited to that.
- Within the psychology realm, the expression Psychological Set should be taken as an overall umbrella term for a variety of Sets in psychology, which use different prefixes (e.g., Mental/Perceptual/ Response/Defensive/ Behavioral / Motor, etc.)
- Backster might have been wrong in using the term Psychological Set to explain the innate tendency to respond to the most threatening stimuli while ignoring the others, but was right in pointing out the phenomenon and also that identifying certain stimuli as more threatening than the others depends on the specific Sets that one holds.

A Note on Salience, Psychological Set and Survival Mechanisms

- Reacting to salient stimuli is also an underlying survival mechanism; however, determining which stimuli are more salient depends a lot on the specific psychological set that the person holds at the time.
- A main problem with the Differential Salience Theory for explaining the CQT is the existing of tautological reasoning as follows:
 - **Question:** What causes the difference in the relative strength of reactions to questions?
 - **Answer:** The relative salience of the questions.
 - **Question:** How can you tell the existence of differential salience between the questions?
 - **Answer:** By looking at the difference in the relative strength of reactions to the questions?
 - **Question:** What causes the difference in the relative strength of reactions to questions?
 - **Answer:** The relative salience of the questions.
- In order to solve this tautological reasoning, Salience must be defined independently, outside the loop.

In what respects the RIG theoretical framework presents an alternative to the Psychological Set, the Differential Salience, the Preliminary Process, and the Cognitive Load Theories?

- **Backster's Psychological Set** theoretical framework suggests that people respond with FFF kind of reactions to the most threatening stimuli during the test
- Threat causes physiological reactions.
- **Psychological Set** determines which category of questions presents the most threatening stimulus to the individual subject.
- Other prominent figures in the polygraph field promote the **Differential Salience Hypothesis** suggesting that People respond Physiologically to the Salience of the stimuli in direct relation to its degree.
- **Salience** attracts attention and causes physiological reactions.
- Differential Salience mechanism (it is not clear how it works in CQT) defines the relative salience of the two types of questions to the individual subject.

- The **Preliminary Process theory** deals primarily with the nature of the internal responding processes that affect the kind of physiological responses produced by lying. However, it fails to deal with the difference found in the pattern of responding between truthful and deceptive examinees (Ginton, 2015).
- The **Cognitive Load theoretical framework** attributes the physiological reaction to the amount of cognitive load invested in lying.
- Lying requires cognitive efforts, and cognitive effort stimulates the ANS activity.
- Truthful examinees do not lie on the relevant issue so, no cognitive load due to lying is developed when they face the relevant questions. However, they lie or being uncertain about the comparison questions, and that involves cognitive efforts that are manifested by the increased physiological reactions.
- In contrast, the main effect that the RIG framework attributes to the cognitive load is increasing the RIG strength and by that affecting the amount of free attention available to the comparison issues sphere.
- **RIG** is not a generator of reactions neither a direct stimulator or inhibitor of them.
- Reactions are triggered by survival-pertinent-stimuli (internal & external).
- **RIG** attracts and binds attention to the relevant issue, and its strength affects the balance of physiological responses between the two question categories by modulating the level of free attention available to the Comparison sphere.

The RIG strength offers a psychological mechanism by which the differential crossing of reactions strength that we see between the Relevant and the Comparison questions in the two populations – deceptive and truthful – occurs. Whereas the other theoretical frameworks concentrate on what causes the reactions, be it Salience, Threat, Cognitive Load, or Psychophysiological Processing, and claim that these factors affect the strength of the reactions in such a way that differentiates between the two populations, without suggesting the mechanism through which it occurs.

The current state of the RIG Strength theoretical framework needs proactive research support, and I call upon researchers to put their minds, efforts, and money in this challenge.

References

- American Polygraph Association (2011), 'Report of the Ad Hoc Committee on validated techniques'. *Polygraph*, 40(4), 196–305.
- Ginton, A. (2009), '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'. *Polygraph*, 38, 204–217.
- Ginton, A. (2015), 'Good intentions that fail to cope with the main point in CQT: a comment on Palmatier and Rovner'. *International Journal of Psychophysiology*, 95, 25–28. DOI: 10.1016/j.ijpsycho.2014.09.005.
- Ginton, A. (2017), 'Examining different types of comparison questions in a field study of CQT polygraph technique. Theoretical and practical implications'. *Journal of Investigative Psychology and Offender Profiling*, 14, pp. 1–13. DOI: 10.1002/jip.147.
- Honts, C.R. (2004), The psychophysiological detection of deception, [in:] Granhag, P. and Stromwall, L. (eds.), *Detection of Deception in Forensic Contexts*, Cambridge University Press, pp. 103–123.
- Horvath, F.S. (1977), 'The effect of selected variables on interpretation of polygraph records'. *Journal of Applied Psychology*, 62, 127–136.
- Iacono, W. G., & Ben-Shakhar, G. (2019), 'Current status of forensic lie detection with the comparison question technique: An update of the 2003 National Academy of Sciences report on polygraph testing'. *Law and Human Behavior*, 43, 86–98.
- Kircher, J.C., Horowitz, S.W., and Raskin, D.C. (1988), 'Meta-analysis of mock crime studies of the control question polygraph technique'. *Law and Human Behavior*, 12, 79–90.
- Krapohl, D.J., and Shaw, P.K. (2015), *Fundamentals of Polygraph Practice*, Elsevier Inc., Academic Press, San-Diego, Ca, USA.
- National Research Council, (2003), *The Polygraph and Lie Detection*, National Academies Press, Washington, D.C.
- Nelson, R. (2011), 'Monte Carlo Study of Criterion Validity for Two-Question Zone Comparison Tests with the Empirical Scoring System, Seven Position, and Three-Position Scoring Models'. *Polygraph*, 40, 146–156.
- Nelson, R., and Handler, M. (2008), 'Brute-Force Comparison: A Monte Carlo Study of the Objective Scoring System version 3 (OSS-3) and Human Polygraph Scorers'. *Polygraph*, 37, 185–205.

Raskin, D.C., Honts, C.R., Nelson, R., and Handler, M. (2015), 'Monte Carlo Estimates of the Validity of Four Relevant Question Polygraph Examinations'. *Polygraph*, 44, 1–27.

Raskin, D.C., and Kircher, J.C. (2014), Validity of Polygraph Techniques and Decision Methods, [in:] Raskin, D.C., Honts, C.R., and Kircher, J.C. (eds.), *Credibility Assessment; Scientific Research and Applications*, Elsevier Academic Press, San Diego.

Shterzer G. & Elaad E. (1985), Validity of the control question test in two levels of the severity of crimes. Proceedings of IDENTTA-'85, [in:] *Anti-Terrorism; Forensic Science; Psychology in Police Investigations* (pp. 155–166). Jerusalem, Israel.

Vrij, A. (2008), *Detecting Lies and Deceit, Pitfalls, and Opportunities*, Wiley and Sons, 2nd ed., Chichester, England.