

# Polygraph

VOLUME 29

2000

NUMBER 3

## Contents

Department of Defense Polygraph Program Annual Report to Congress - Fiscal Year 1999	209
A Field Validity Study of the Integrated Zone Comparison Technique Nathan J. Gordon, William L. Fleisher, Hisham Morsie, Walid Habib & Khaled Salah	220
The Debate Over Polygraph in Poland Aleksander Krzyściń	226
Computer Algorithm Comparison Andrew B. Dollins, Donald J. Krapohl & Donnie W. Dutton	237
Identifi Comments on Dollins et al's Computer Algorithm Comparison W. Keith Hedges	248
CPS Comments on Dollins et al's Computer Algorithm Comparison John C. Kircher & David C. Raskin	250
JHU/APL Comments on Dollins et al's Computer Algorithm Comparison John C. Harris	253
A Response to Comments Donald J. Krapohl & Donnie W. Dutton	256
Polygraph in the Crimea: First Results and Future Perspectives Gennady G. Moskal & Vitaliy I. Egorov	258
A Critical Analysis of Amsel's Comparative Study of the Exclusive v. Nonexclusive Comparison Question James Allan Matte & Cleve Backster	261
Addendum to 1990 Field Study of the Friendly Polygrapher Hypothesis James Allan Matte & Thomas E. Armitage	267
Bibliography - The Published Works of Norman Ansley Genni Arledge	270

Published Quarterly

© American Polygraph Association, 2000

P.O. Box 8037, Chattanooga, Tennessee 37414-0037

## **A Field Validity Study of the Integrated Zone Comparison Technique**

**Nathan J. Gordon, William L. Fleisher, Hisham Morsie,  
Walid Habib and Khaled Salah**

### **Abstract**

This field study tested the validity of the Integrated Zone Comparison Technique (IZCT) designed for specific issue tests, utilizing 309 confirmed field cases by examiners of the Egyptian Government. During 1998 and 1999 the IZCT correctly identified 100% of the innocent examinees and 99.5% of the guilty examinees, excluding Inconclusives, or 94.8% of innocent examinees and 90.5% of the deceptive examinees, including Inconclusives. A detailed explanation of the technique is included in this report.

Key words: Egypt, field study, Integrated Zone Comparison Technique, validity

This field study is the first published research on the polygraph Integrated Zone Comparison Technique (IZCT). Its theory and methodology were published in the textbook, *Forensic Psychophysiology; Use of The Polygraph* (Matte, 1996). The IZCT is a modification of the Backster Zone Comparison Technique. The IZCT's structure is comprised of three probable-lie comparison questions and three relevant questions, similar to the technique used and validated by the University of Utah (Raskin, Barland, & Podlesney, 1977). In the Raskin et al. study the experimenters reported 95% accuracy for the technique in correctly identifying truth from deception. Like the Utah technique, the IZCT also starts with a number test, followed by a minimum of three crime charts. The IZCT has been taught at the Academy for Scientific Investigative Training since 1987, and is currently being used by law enforcement, government, and private examiners in the United States, Egypt, Israel, Switzerland, South Africa and France. The results of this study apply only to the IZCT when used without deviation. The IZCT may

be used in single-issue, as well as multi-issue tests.

Originally, Academy students were taught that, when they had an examination which only involved a single issue, they should use the Backster You Phase Zone Comparison Technique. If they had an examination which lent itself to a multi-issue format, they were instructed to use a Backster S-K-Y, Reid, MGQT, or Arther technique.

In 1987, the IZCT was originated by Nathan J. Gordon, Dr. William Waid, and Philip Cochetti. Dr. Waid suggested that a technique be designed which utilized sound formatting principles, but allowed the examiner the flexibility to use a common test structure in both single-issue and multi-issue cases.

The format for the IZCT is as follows:

1. Irrelevant                      Is your first name \_\_\_\_\_?
2. Outside Issue                Do you understand that I will only ask the questions I reviewed?

---

Nathan Gordon is the owner and principal instructor for the National Academy for Scientific Investigative Training, and regular contributor to *Polygraph*. Reprint requests should be sent to Nathan Gordon, Academy for Scientific Investigative Training, 1704 Locust, 2nd Floor, Philadelphia, PA 19103, or by e-mail to [truthdoctor@polygraph-training.com](mailto:truthdoctor@polygraph-training.com).

3. Weak relevant Do you intend to deliberately lie to any test question?
4. Irrelevant Were you born in \_\_\_?
5. Comparison During the first (-2 years from age at time crime was committed) years of your life, did you ever \_\_\_\_\_?
6. Flexible Relevant
7. Optional Irrelevant Is your last name \_\_\_\_\_?
8. Comparison In your entire life, did you ever (similar comparison issue as utilized in question 5)?
9. Flexible Relevant
10. Optional Irrelevant Is today \_\_\_\_\_?
11. Comparison During the (-2 years from age at time crime was committed) years of your life, did you ever (similar comparison issue as utilized in question 5)?
12. Flexible Relevant
13. Countermeasure Did you deliberately do anything to try and beat this test?

### Technique Description

The following describes the reasoning behind the questions utilized in the IZCT:

**Question 1:** Neutral question, used to acclimate the examinee to the test and to establish a norm.

**Question 2:** We believe that the traditional symptomatic questions (Q25: Do you believe me when I promise you I won't ask you a question we haven't gone over word for word?; Q26: Even though I promised I would not - are you afraid I'll ask you a question we haven't

gone over word for word?) developed by Backster (1979)) were very cumbersome. Gordon et al believe that reviewing two symptomatic questions may in some cases actually created distrust of the examiner, as the examinee contemplated the rationale for the questions. To address this problem, a simply worded outside issue question is asked at the beginning of the test as a safeguard against super dampening.

**Question 3:** In a polygraph examination we are attempting to monitor the flow of the examinee's psychological set to identify those question stimuli, comparison or relevant, that threaten the examinee the most. Since the problem is we sometimes have truthful people presenting deceptive charts (false positives), Gordon believe that starting the examination by directing the examinee only to the relevant questions with the traditional Backster Q39 (Regarding the relevant issue, do you intend to answer each question truthfully about that?) was inappropriately directing the examinee to focus only on the red zone (relevant questions). The reworded question in the IZCT (Do you intend to deliberately lie to any test question?), by its inclusive structure, forces everyone to lie equally to that question. Thus, Q3 allows examinees to self-set to their greatest threat, be it the red zone (relevant) or green zone (comparison), as they themselves perceive it.

**Question 4:** Used to reestablish a norm, after question number 3, and before the salient phase (comparison and relevant questions) of the test begins.

**Question 5:** Because the first chart of the examination employs a green - red format, an exclusive comparison question is used (Gordon, 1999), preventing the deceptive examinee from perceiving it as a relevant question. Going back two years in age, from the time of the crime, maximizes the comparison question time period, while separating it in time from the relevant issue time period.

**Question 6:** Depending on the needs of the case, the examiner can use a strong or medium relevant question which deals with either direct or secondary involvement.

**Question 7:** Reviewed irrelevant question, but not used unless needed to reestablish the norm during the test following a continuing physiological reaction or artifact.

**Question 8:** Inclusive comparison question is asked, since a relevant question precedes it. This comparison question may be used as a competitive comparison question, which is extremely useful in employee theft type examinations.

**Question 9:** Examiner can use a strong or medium relevant question that deals with either direct or secondary involvement, depending on the needs of the case.

**Question 10:** Reviewed irrelevant question, which is not used unless needed to reestablish a norm someplace during the test.

**Question 11:** Exclusive comparison question that maximizes the time period covered, ensuring a valid probable-lie issue.

**Question 12:** Examiner can use a strong or medium relevant question that deals with either direct or secondary involvement, depending on the needs of the case.

**Question 13:** Used as weak relevant to withdraw the examinee from the test mode, but often provides useful information for the examiner.

### IZCT Sequence

The examination begins with a known-number demonstration (stim) test. The examinee is asked to pick a number between 2 and 5, and reveal the choice. The examiner then administers a single chart instructing the examinee to answer "no" to every question from 1 to 6, including the number actually selected. The examiner then explains that this allows for evaluation to ensure that if he or she lies, the polygraph procedure can detect it.

The IZCT sequence is then administered as follows:

**Chart 1.** Silent answer format  
1, 2, 3, 4, 5, 6, 8, 9, 11, 12, 13

**Chart 2.** Mixed out loud sequence, rotating the positions of the relevant questions  
7, 2, 5, 12, 8, 6, 11, 9, 3, 13

**Chart 3.** Reversal of the comparison-relevant (green-red) sequence, to a relevant-comparison (red-green) sequence  
1, 2, 3, 9, 5, 12, 8, 6, 11, 13

### Silent Answer Test

The Silent Answer Test (SAT) format, originated by Reid and Horvath (1972), is used in Chart 1 with the IZCT. In the Reid technique this format is only used in the latter part of the testing process when the examiner is having problems making a decision. Reid and Horvath reported among other advantages, that the SAT produced enhanced electrodermal reactions, and, "even if the subject failed to react significantly on the SAT, it tends to induce greater responses on the later tests." The Utah technique also utilized the SAT on the fourth crime chart if the first three charts were not conclusive (Raskin, Barland & Podlesney, 1977.)

In the Integrated Zone Comparison Technique, the SAT is introduced as the first crime chart in the following manner:

"In this first test I am going to ask you the questions I just reviewed with you. During the test I don't want you to answer out loud. I just want you to listen to the questions one more time, get used to being attached to the instrument, and having me ask you questions. It is to make sure you have understood all of the questions, feel comfortable with them, and most importantly, that you have answered every question truthfully. If you remember anything you haven't told me about, you can tell me as soon as the test is over, but don't say anything out loud during this first test: just listen."

The purpose of using the SAT in the first chart is that most examinees do not consciously perceive the chart as a threat, since they are not answering out loud, and lying. Thus, they rarely attempt any type of mental or physical countermeasures. This not only results in an excellent chart of

physiological tracings, but also excellent reactions to the appropriate zone of questions where deception will be attempted. It is not the utterance of "yes" or "no" that creates sympathetic nervous system arousal. It is the examinee's cognitive recognition of the threat the questions pose to his or her well being in a format to which they will attempt deception.

Golden, in the Listen-Answer Technique (1992), hypothesized that maximum psychophysiological stress would be generated during the presentation of an incriminating question, when the person was instructed just to listen, and that vocalization to the same question would actually allow a degree of psychophysiological relief. He made the analogy that for the deceptive person, not to be able to utter his or her lie was like a person stubbing a toe and not being able to yell out in pain, thus resulting in greater psychophysiological reactions to take occur.

In Chart 2, the examinee is instructed to answer out loud each question truthfully. The examiner further instructs that lying to any question, regardless of which question it is, could result in the examinee failing the test. This verbal stimulation further helps self-set examinees to the zone that poses to them their greatest threat.

During this chart the relevant question positions are rotated to allow each relevant question to be next to a different comparison question. This will ultimately pair each of the relevant questions with each of the comparison questions once during the three-chart examination. Mixing of the question order is done as a safeguard against habituation and anticipation.

In Chart 3, the sequence of the chart is reversed from a green-red format (comparison-relevant), to a red-green format (relevant-comparison). Gordon and Cochetti (1982), assert that green-red testing formats leaned a test toward truthfulness, and red-green testing formats leaned a test toward deception. In the IZCT, the first two charts are biased toward a truthful outcome, and the third chart is biased toward a deceptive outcome. We believe that this reversal of the question order in the IZCT safeguards against both false positives and false negatives, giving the overall process a

more accurate and balanced conclusion. Furthermore, we do not believe that the IZCT test structure has any impact on the number of inconclusive outcomes.

## Procedure

As pointed out in Matte (1996), there is very little literature on validity and reliability of polygraph techniques in field cases. All polygraph examinations used in the present study were conducted by four examiners of the Egyptian Government from 1998 to 1999. All four examiners were trained at the Academy for Scientific Investigative Training. All of the examinations were single-issue tests, utilizing the format cited. Charts were scored by the Horizontal Scoring System (Gordon & Cochetti, 1987) and the Academy's Algorithm for Manual Scoring (Gordon, 1999).

The polygraph utilized in the examinations was the Lafayette LX 2000 Computerized System, which monitored thoracic and diaphragmatic breathing, electrodermal response, and cardiovascular activity.

## Results

Five hundred seventy-six examinations were conducted, 47 of which were re-examinations due to initial Inconclusive results. The 47 Inconclusive examinations had been classified as such because the numerical scores had not met the threshold established for the Horizontal Scoring System of a  $\pm 13$  (Honts & Driscoll, 1987), for a single-issue examination consisting of three relevant questions, administered over three charts. Of these 576 examinations 309 were confirmed by confession, or judicial convictions. Among the 309 verified cases, 288 were confirmed by confession, and 21 by judicial conviction. It should be noted that in the examinations confirmed by conviction, polygraph results played no part in the judicial decision.

Using the 309 confirmed cases, the decisions of the polygraphists were 210 Deception Indicated (DI), 74 No Deception Indicated (NDI), and 25 Inconclusive (Table 1). Of the 232 examinees that were later confirmed by confession or judicial conviction to be guilty, 210 were determined by the

polygraph examiners to be deceptive, 21 were called Inconclusive, and 1 was determined to be truthful. The polygraph examiners correctly identified 99.5% of the deceptive examinees in this sample, excluding Inconclusives, and 90.5% including Inconclusives. Of the 77 confirmed truthful examinees, 73 were called NDI by the polygraph examiners, and 4 were called Inconclusive. The polygraph examiners correctly classified 100% of the truthful examinees when Inconclusives were excluded, and 94.8% including Inconclusives.

One hundred three of the 309 examinations had documentation of the results of a second examiner's blind numerical analysis of the polygraph charts using either the Horizontal Scoring System, or the 7-position scale as utilized in the Utah System (Weaver, 1980). These blind evaluators reached the same conclusion as the original examiner 96 out of the 103 re-evaluations, or 93.2%.

**Table 1. Ground truth and polygraph decisions for 309 confirmed field cases.**

		<u>Ground Truth</u>		Total
		Deceptive	Nondeceptive	
<u>Decisions</u>	DI	<b>210 (90.5%)</b>	<b>0 (0.0%)</b>	<b>210</b>
	Inconclusive	<b>21 (9.1%)</b>	<b>4 (5.2%)</b>	<b>25</b>
	NDI	<b>1 (.4%)</b>	<b>73 (94.8)</b>	<b>74</b>
	<b>Total</b>	<b>232 (100%)</b>	<b>77 (100%)</b>	<b>309</b>

**Conclusion**

This validation study demonstrates the efficacy of the Integrated Zone Comparison Technique. The IZCT is an innovative and powerful technique which ethically directs the examinee to his or her proper zone of greatest threat, resulting in accurate determinations of truth or deception.

Because the present study was conducted within the Egyptian Government, raw data were not readily available to

independent evaluators. Future research could address the IZCT in a non-military setting. In addition, studies should also be undertaken to compare results with the IZCT testing method using scoring systems other than the Academy's Horizontal Scoring System, and Examiner Algorithm for Manual Scoring. In the interest of scientific replication, manuals explaining the IZCT and Academy's scoring systems are available through the Academy for Scientific Investigative Training, 1704 Locust Street, Philadelphia, PA 19103.

**References**

Backster, C. (1979) *Standardized Polygraph Notepack and Technique Guide*.

Golden, R. (1992). *Ready, Aim, Hire; The Riddle of the Lie; A Scientific Approach To Lie Detection* Pages 81 - 101. PerSysCo Publishing, Oak Brook, IL.

Gordon, N.J. (1999) The Academy for Scientific Investigative Training's Horizontal Scoring System and Examiner's Algorithm for Chart Interpretation. *Polygraph* 28(1), 56-64.

- Gordon, N.J. (1999) Inclusive vs. Exclusive Controls. *American Association of Police Polygraphists' Journal*.
- Gordon, N.J. and Cochetti, P.M. (1982). The Positive Control Concept and Technique. *Polygraph* 11(4), 330 - 342.
- Gordon, N.J., & Cochetti, P.M. (1987). The Horizontal Scoring System. *Polygraph* 16(2), 116-125.
- Honts, C.R., & Driscoll, L.N. (1987). An evaluation of the reliability and validity of rank order scoring and standard numerical scoring of polygraph charts. *Polygraph* 16(4) 241-257.
- Horvath, F.S. and Reid, J. E. (1972). The polygraph silent answer test. *Journal of Criminal Law, Criminology and Police Science* 63(2), 285 - 293.
- Matte, J.A.(1996). *Forensic Psychophysiology Using The Polygraph*. Williamsville, NY, J.A.M. Publications.
- Raskin, D.C., Barland, G.H., & Podlesny, J.A. (1977). Validity and reliability of detection of deception. *Polygraph* 6(1), 1 - 39.
- Weaver, R.S. (1980). The numerical evaluation of polygraph charts: Evolution and comparison of three major systems. *Polygraph* 9(2), 94 -108.