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James Allan Matte*
Matte Polygraph Service, Inc.
Williamsville, New York
USA

Effect of the Stimulation Test Administered Before and After the First Relevant Chart of the Control Question Test

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During the pretest interview of a psychophysiological veracity (PV) examination, every effort is made to allay any fears the innocent examinee may have regarding the accuracy of the results of the examination, by explaining the scientific principles involved in the test, the sophistication of the polygraph instrument, and the complete objectivity of chart analysis through a numerical quantification system or computer algorithm. However, the best pretest interview by the most competent polygraphist may sometimes fail to convince an examinee of the accuracy and reliability of the PV examination. In these cases, an innocent examinee may be concerned that the test may reflect that he lied to the relevant or crime questions, which in turn will cause

* jamesallanmatte@mattepolygraph.com

the relevant questions to become a threat to his well-being. This threat will be competing with the control (comparison) questions rendering the charts more difficult to analyze and in some cases false positive or inconclusive findings may occur.

The Stimulation Test is designed to reassure the innocent examinee of the accuracy of the test and of the competency of the polygraphist administering the PV examination. It also serves to stimulate the innocent and guilty examinee. However the Stimulation Test also serves as a *control test* to establish the examinee's capability and manner of response to a known lie under controlled conditions. It is also important that the examinee perceives the *control-stimulation* test as the means by which the polygraphist acquires a *known deception exemplar* from the examinee, thus will not relate that role to the exclusive or non-exclusive control questions, which are used for comparison with their neighboring relevant questions. Otherwise the control (comparison) questions can become as strong as or stronger than their neighboring relevant questions if a guilty examinee perceives the control questions as the means by which a *known deception exemplar* is obtained for comparison with the relevant questions thus producing a greater threat from the control questions and an invitation to use countermeasures. (See Matte 1998, Matte & Reuss 1999). The control-stimulation test should be administered before any of the relevant tests related to the target issue so that each succeeding test will have been subjected to the same psychological influence. While this statement is not in agreement with those polygraph techniques of the Reid Technique persuasion that use the Stimulation Test as the second chart, between the first and second relevant test chart, the following published research and empirical data reveals a persuasive argument for its use as the first chart before the administration of the relevant tests.

It should be stated at the outset that the Backster Zone Comparison Technique (Adams 2012), the Quadri-Track Zone Comparison Technique (Matte, 1996, 2011), the Integrated Zone Comparison Technique (Gordon, 2012), the Utah Zone Comparison Technique (Handler & Nelson 2009), the Air Force Modified General Question Technique (APA 2011a) and the Federal Zone Comparison Technique (APA 2011b), all administer the Stimulation Test as the first chart, before any of the relevant tests are administered. In addition, Stan Abrams in his 1989 book "The Complete Polygraph Handbook" (P. 65-66)¹ stated that "although the majority of examiners who use a stim

¹ J. Widacki (2009; Abrams 1989, 120). Page 120 refers to the Stimulation Test as one of the six different test types used in the Reid Control Question Technique.

test prefer to position it after the first test, the writer feels that it is more appropriately administered first. Because the examinee has been told that the test's purpose is to determine the pattern of tracings when he or she responds deceptively and to ascertain whether the examinee is a fit subject for testing, it appears more logical to test him or her on this procedure prior to the actual examination. Moreover, this permits the polygraphist to separate this test from the chart and show it to the subject demonstrating how easily a lie is detected. This is more effective than simply informing him of the number on which the subject lied."

Abrams reiterated his use of the Stimulation Test as the first chart in "Polygraph Testing of the Pedophile" (Abrams 1983, P.66).

Furthermore Jerzy Konieczny, 2009; Richard Hickman, 1978; Keith Fingerhut 1978; Kenneth Scarce 1978; recommended administering the Stimulation Test as the first chart in the series of tests.

Logically, a sensitivity test should be conducted as the first test before any of the relevant tests. To do otherwise may raise an examinee's suspicion that something went wrong in the first relevant test, arousing the innocent examinee's fear of error, thus redirecting the truthful examinee's psychological set from the control questions onto the relevant questions.

However, several published studies regarding the effectiveness of the Stimulation Test were reported (Widacki, 2009) which indicated that the administration of the Stimulation Test as the second chart was indeed effective in increasing the strength and diagnostic value of the autonomic responses to the control and relevant questions for the innocent and deceptive respectively (Senese 1978; Decker 1978; Krzyscin 1980; Widacki 1982, 2008; Reid & Inbau 1966, 1977). Nevertheless, these studies did not address, calculate and compare countertrend scores produced by the use of the Stimulation Test as the first chart, second chart or no use of a Stimulation Test. Furthermore, the logic of its presentation as the first chart in acquiring a *known deception exemplar* to prevent its application to the control questions which would include the first relevant chart was not considered in aforementioned studies.

The lack of uniformity in the research construct and analog model of the various studies conducted on the Stimulation Test have not surprisingly produced varied results. Ellson, Davis, Saltzman and burke (1952) reported that examinees whose deception was detected and who were informed of this, were actually more difficult to correctly evaluate on subsequent tests, where-

as Gustafson and Orne (1963) found a tendency, although not statistically significant, for motivated subjects to be more difficult to accurately diagnose in later tests. Those examinees who had not been given any feedback or who had been told that their deception had been discovered, demonstrated no change in detectability. In a follow-up study, Gustafson and Orne (1965) indicated that "successful detection maximizes subsequent detection." Another study conducted by Barland and Raskin (1972) reflected limited success in establishing the validity of the Stimulation Test, stating "The manipulation of feedback on the card test failed to produce a reliable effect regarding detection of guilt or innocence." A study on the "Effect of the Location of the Numbers Test on Examiner Decision Rates in Criminal Psychophysiological Detection of Deception Tests" by Widup and Barland (1996) revealed that the location of the numbers test had no apparent practical effect on the distribution of polygraphists' decisions, but cautioned that the lack of ground truth and experimental control in real-life cases makes it difficult to draw firm conclusions. (See also Elaad & Kleiner, 1986). A study by Louis Senese (1978) involving thirty polygraph records from actual investigative cases which were equally divided with fifteen confirmed deceptive subjects and fifteen confirmed truthful subjects all of whom had been administered the Reid Stimulation Test as the second chart following the first relevant test, were reviewed by seven staff polygraphists from John E. Reid and Associates. None of the thirty cases were administered the Stimulation Test as the first chart before any of the relevant tests. The polygraphists were given the first relevant chart from each of the thirty cases for their analysis and conclusion. Subsequently, these same polygraphists were given the second relevant chart of the thirty cases administered after the conduct of the Stimulation test for their analysis and conclusion. The polygraphists were not informed on the accuracy of their first chart interpretation nor were they informed of the administration of a Stimulation Test. The results revealed that the accuracy in correctly detecting deceptive subjects and identifying truthful subjects in the first chart was 55.7 percent. However, after the Stimulation Test, the accuracy in the third chart (Second Relevant Chart) rose to 71.4 percent, increasing the level of accuracy by 28.12 percent. Incorrect judgments of identifying truthful subjects as deceptive, or deceptive subjects as truthful was 13.3 percent in the first chart evaluation. Incorrect judgment of truthful subjects as deceptive and deceptive subjects as truthful in the third chart evaluation decreased to 9 percent, reducing errors by 32.3 percent. The inconclusive rate, which is the percentage of cases in which a polygraphist could not evaluate a subject as being truthful or deceptive due to erratic or inconsistent responses, was 20.5 percent on the first chart evaluation. Results on the third chart evaluation

after the card test showed a reduction to 14.3 percent for the inconclusive rate, reflecting a 30.2 percent decrease in inconclusive results. Senese also measured subject unresponsiveness, the lack of significant emotional disturbances on the relevant, irrelevant or control questions. On the first chart 10.5 percent of the polygraphists' opinions were that the subjects were unresponsive. Results of unresponsiveness on the third chart evaluation decreased to 5.13 percent, yielding a 49.5 percent reduction in unresponsive results. While Senese's study reveals and confirms the effectiveness of the Stimulation Test administered as the second chart after the first relevant test chart, it offers no comparison with the Stimulation Test administered as the first chart before any of the relevant tests.

A field research study (Matte, Reuss 1989) involving 122 confirmed actual criminal cases investigated the effect of the Stimulation Test on the relevant chart that follows the Stimulation Test compared to the first relevant chart, and further investigated the effect of the Stimulation Test when administered as the first chart before the administration of any of the relevant test charts. In addition, the countertrend scores (scores that are inconsistent with ground truth) of subjects who were not administered a Stimulation Test were also considered and reported. In the aforesaid study, the Quadri-Track Zone Comparison Technique was used. Each chart has nine separate spots that are scored, three in the pneumograph tracing, three in the electrodermal tracing, and three in the cardiograph tracing. A minimum of two charts are required to reach a conclusion and as many as four charts are collected. Therefore two charts offer 18 spots, three charts offer 27 spots and four charts offer 36 spots for scoring. It is therefore not unusual for one or more spots to produce a score that does not follow the general trend consistent with ground truth, and these renegade scores are usually not strong enough to weaken the total tally of the general trend scores normally consistent with ground truth, into an inconclusive or false positive/negative conclusion. It is imperative however that countertrend scores be kept to a minimum.

In examining the countertrend scores, scores that do not follow the true trend as later established by ground truth, it was found that in the Innocent cases, 20 subject were administered the Stimulation Test after the conduct of the first relevant chart, experiencing a total countertrend score of -124 which averages at -6.2 per subject, whereas the 6 subjects who were administered the Stimulation Test as the first chart before the conduct of the first relevant chart experienced a total countertrend score of -27, an average of -4.5 per subject. The 32 subjects who were not administered a Stimulation Test nev-

ertheless experienced a countertrend score of -142 averaging -4.4 per subject. For the Guilty (as later verified) subjects, 40 subjects were administered the Stimulation Test after the first relevant chart for a total countertrend score of +110 averaging +3.0 per subject versus 20 Guilty subjects who were administered the Stimulation Test as the first chart with a total countertrend score of +39 averaging +2.0 per Guilty subject, while 4 Guilty subjects who were not administered a Stimulation Test had a total countertrend score of +4 averaging +1 per subject. See Table 1A for innocent cases and Table 1B for guilty cases regarding correlation to countertrend scores.²

When the Stimulation Test is given before chart one, the Innocent cases show a negative correlation (-.434) between the changes (between chart one and chart two) and the countertrend indicating the influence was positive and not related to a stimulation that produces a countertrend. The correlation of .1 for chart one values and the countertrend is quite low, also supporting this point. (See Table 1, A.1).

When the Stimulation Test is given before chart two, the higher positive correlation (.441) between the changes and the countertrend scores indicates that in the Innocent cases the Stimulation Test causes a significant influence counter to the final scores and counterproductive to the use of the polygraph. This supports the recommendation that the Stimulation Test is better given before the first chart rather than before chart two. (See Table 1, A.2).

For the Guilty subjects the changes have a negative correlation (-.002) to the countertrend when the Stimulation Test is given before chart one and a slight positive correlation (.108) when given before chart two. This indicates that the Stimulation Test is more effective if given before chart one and slightly counterproductive when given before chart two. (See Table 1, B.1.2).

The Guilty cases show significantly lower overall countertrend scores ($t(120) = 10.39, p < .001$) but nevertheless showed the same trend of +1 for Guilty examinees who were not administered a Stimulation Test, +2 for those Guilty examinees who were administered a Stimulation Test as the first chart, and

² An analogy can be made of the fact that when a significant change in a test question is made in between charts during the collection of the physiological data, at least two polygraph charts must be collected that include that change in order to make a decision of truth or deception, inasmuch as the chart(s) preceding that question change are different in content and thus must be treated as a separate test or excluded from the decision making process with justifiable explanation.

+3 for those Guilty examinees who were administered a Stimulation Test as the second chart. There was no statistical difference in countertrend scores between those Innocent examinees who were not administered a Stimulation Test and those Innocent examinees that were administered a Stimulation Test as the first chart (-4.4 vs. -4.5 respectively), $t(36) = -0.24, p = .812$. However, there was a statistical difference at the 10% level between Innocent examinees that were administered the Stimulation Test after the first relevant chart (-6.2) and those Innocent examinees that were not administered a Stimulation test (-4.4), $t(50) = -1.71, p = .093$. There were no significant differences between Innocent examinees administered the Stimulation test as the first chart and Innocent examinees who were administered as the second chart, ($t(24) = 0.70, p = .490$). However, we must take into heavy consideration the rather small number of Innocent cases (6) in which the Stimulation Test was administered as the first chart, versus 20 cases involving second chart Stimulation Tests in evaluating the aforementioned data. Further research in this area is recommended.

For the guilty, it would thus appear that the administration of the Stimulation Test as the first chart causes no statistically significant increase ($t(22) = -0.11, p = .916$) in countertrend scores compared to having no Stimulation test. Administration as the second chart also causes no increase in countertrend scores ($t(42) = 1.03, p = .311$) compared to having no Stimulation test. But there was a significant difference between guilty subjects who were administered the Stimulation Test after the first relevant chart and as the first chart on their countertrend scores, $t(58) = -2.16, p = .035$.

Nonetheless, the logic of administering the Stimulation Test as the first test or chart (rather than as the second chart) does not escape the astute examinee, especially the Innocent who may wonder why a test purportedly designed to determine the examinee's suitability for the test is being administered after the first relevant chart has already been conducted. The ensuing potential arousal of the examinee's *fear of error* regarding the first test or chart can only be felt by the Innocent examinee; inasmuch as the Guilty examinee hopes that an error will be made on his test. But this "fear of error" by the Innocent can result in a false positive or inconclusive finding. Furthermore, the administration of the Stimulation Test as the first test affects all relevant tests equally, whereas the administration of the Stimulation Test as the second chart has a psychological effect on those relevant test charts that follow it that is absent in the first relevant test chart preceding the Stimulation Test. In the latter instance, it could be argued that the scores from the first rel-

evant test chart cannot be added to the scores acquired from those relevant test charts collected after the administration of the Stimulation Test because of the psychological impact that the Stimulation Test had on the examinee during the relevant test charts following the Stimulation Test, which was absent during the administration of the first relevant test chart that preceded the Stimulation Test. Finally, the administration of the Stimulation Test as the first test provides the polygraphist with a Control Test of the examinee's capability and manner of response, and an opportunity to make necessary adjustments prior to the conduct of the relevant tests.

Table 1. Stimulation Test – Influence on the Charts

A. INNOCENT CASES			
1. Given Before Chart 1 N = 6			
	Change 1 to 2	Chart 1	Countertrend
Sum	-1	7	-27
Mean	-.17	1.17	-4.50
SD	6.55	5.46	3.83
Correlation to Countertrend	-.434	.100	
2. Given Before Chart 2 N = 20			
	Change 1 to 2	Countertrend	
Sum	-53	-125	
Mean	2.65	-6.25	
SD	6.08	5.69	
Correlation to Countertrend	.441		
B. GUILTY CASES			
1. Given Before Chart 1 N = 20			
	Change 1 to 2	Chart 1	Countertrend
Sum	-37	-126	17
Mean	-1.85	-6.30	.85
SD	3.76	2.49	2.70
Correlation to Countertrend	-.003	-.179	
2. Given Before Chart 2 N = 40			
	Change 1 to 2	Countertrend	
Sum	-33	103	
Mean	-.82	2.58	
SD	5.73	3.01	
Correlation to Countertrend	.108		

Table 2

A. INNOCENT CASES								
Given Before Chart 1 N = 6		Given Before Chart 2 N = 20		Not Given N = 32				
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
-4.50	3.83	-6.25	5.69	-	-	0.70	24	.490
-4.50	3.83	-	-	-4.16	3.12	-0.24	36	.812
-	-	-6.25	5.69	-4.16	3.12	-1.71	50	.093
B. GUILTY CASES								
Given Before Chart 1 N = 20		Given Before Chart 2 N = 40		Not Given N = 4				
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
0.85	2.70	2.58	3.01	-	-	-2.16	58	.035
0.85	2.70	-	-	1.00	1.41	-0.11	22	.916
-	-	2.58	3.01	1.00	1.41	1.03	42	.311

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