

A Validation and Reliability Study
of
Counterintelligence Screening Test

1. of the 10 false positives 4 were later to
be lying ^{1. ed level} ^{2. date of birth} ^{1 omitted previous} ^{employment}
2. cannot use BI's as criterion of ground truth
Further, Results not that bad when omit inconclusive

Personal Communication - Loren D. Noland,
Chief - INS COM Polygraph Program, US
Army, September, 1983.

Prepared by
MAJ Gordon H. Barland (Ph.D.)

Security Support Battalion
902d Military Intelligence Group
Fort George G. Meade, Maryland 20755

12 May 1981

INTRODUCTION

The polygraph has been used by the federal government since the early 1950s as a screening technique in lieu of, or as an adjunct to, formal investigation into the background of certain individuals, particularly foreign nationals, when adequate conventional background investigations were impossible, usually for geographical or political considerations. Most often some variant of the relevant-irrelevant test is used when multiple issues must be addressed, as in screening. For a number of theoretical reasons, one would expect a probable-lie control question (PLCQ) test to be more accurate than the relevant-irrelevant test, but conventional PLCQ cannot be applied in many screening situations, for it is difficult to devise an adequate conventional control question which would not itself be relevant.

In an effort to obtain during screening testing the theoretical precision in chart interpretation that control questions should give, MI examiners developed the Counterintelligence Screening Test (CIST) in 1971, which incorporated directed lie control questions (DLCQ). DLCQs are a type of control question which the subject is directed to lie about on the test, after acknowledging that his/her answer would be a lie. DLCQs are designed in such a manner that they are not relevant to the issues of the test, e.g., Have you ever lied to your mother? Directed lie answer: No. The size of the reaction on the DLCQ, when the subject is known to be lying, could then be used as a criterion against which any reaction on the relevant question could be compared. However, the DLCQ concept has never been validated. Because the size of the DLCQ reaction would be expected to be dependent upon how the examiner introduces it, words it, and emphasizes it, the use of the DLCQ is questioned as to validity by some examiners. This study was designed to determine the accuracy of the polygraph when the CIST format with directed lie control questions is used in a mock screening situation, and incorporated three different methods of interpreting the test charts: zone comparison, greatest control comparison, and the relevant-irrelevant method of chart interpretation.

METHOD

Subjects

The 56 subjects who volunteered for this study consisted of 38 military and 18 civilian employees of the US Army assigned to intelligence duties at Fort Meade, Maryland. All had been subjected to background investigations. Forty were men and sixteen were women. They ranged in age from 21 to 55, with a mean of 35 years. The educational level ranged from 12 to 17 years, with a mean of 14.

Examiners

The three polygraph examiners who conducted the tests in this were trained at the US Army Military Police School polygraph course and were certified by the Department of the Army. They had 3, 6, and 9 years of polygraph experience. All examiners were thoroughly familiar with the CIST. To assure standardization of the testing procedure, one examiner was selected to set the standards. A video recording was made of his technique and was shown to the other examiners. Examinations were monitored by the Experimenter to assure that the standard was being followed.

Apparatus

Five different models of Stoelting and Lafayette field polygraphs were used. The polygraphs included the 3-channel all-mechanical Stoelting Executive model 22532, the 4-channel all electronic Stoelting Executive Polyscribe model 22776, the 5-channel combination electronic/mechanical Stoelting Ultrascribe model 80545X, the 4-channel Lafayette model 76056-A with mechanical respiration and electronic cardio, and the 5-channel combination electronic/mechanical Lafayette Pentograph model. All polygraphs recorded respiration, the skin resistance response, and relative blood pressure by means of a cardio cuff.

Procedure

Volunteers were solicited by a written request circulated throughout the US Army Intelligence and Security Command and by personal contact by a member of Polygraph Branch, Security Support Battalion (Provisional). The purpose of the study was explained to each Subject, who was told that the testing would be limited to the Subject's date of birth, place of birth, education, employment and residences. Some Subjects would be instructed to furnish the examiner with false information. Each Subject was informed that the examiner would not conduct any interrogation, but that he would try to determine which Subjects had furnished false information by using only the polygraph. Those Subjects who still desired to participate in this study were instructed to enter truthful information on the biographical data sheet, but to include no information subsequent to the date they had submitted their application for a background investigation. The information on the data sheets was verified by Experimenter by comparing it with the results of the background investigation. The Experimenter then made an appointment for each Subject to take a polygraph examination. Immediately prior to the polygraph examination, Experimenter met each Subject and had Subject draw a slip of paper from a hat to determine whether he was to answer all questions truthfully or not. Those assigned

to the deceptive category then rolled a die to determine the one question to be falsified:

<u>Die number</u>	<u>Background area</u>
1	Date of birth
2	Education
3	Place of birth
4	Employment
5	Residence

All Subjects, both truthful and deceptive, completed a new biographical data form in order to keep from giving the examiner any clue as to the Subjects' treatment condition from the date or condition of the form itself. All Subjects were told that they would later be asked by the polygraph examiner to sign a security pledge (Appendix B). In order to motivate the deceptive Subjects, they were told they would get a \$20 reward if they were able to appear truthful on the polygraph test. All Subjects were briefed on the general nature of the polygraph technique, after which they were escorted by the Experimenter to the examination room, where they were introduced to the polygraph examiner.

Conduct of the Polygraph Examinations

The examinations were conducted utilizing the standards and procedures applied to polygraph examinations conducted in support of intelligence investigations or operations as delineated in the Instructions to Examiners Participating in the Validation Study of the Counterintelligence Screening Test, (Appendix C). Each subject was given a pretest interview during which the purpose of the examination was explained as being a part of a validation and reliability study. An explanation of test procedures, the polygraph instrument, and physiology as it pertains to the polygraph, was given to each subject, after which he was asked about his present physical condition, medical history, history of psychiatric or nervous disorders, the amount of sleep the night prior to testing, and whether he had any personal or work problems of great concern. The information was entered on the examiners worksheet (Appendix D).

The first chart was an acquaintance test. The examiner explained that the acquaintance test was the most important chart made during the examination, because the examiner would have an example of the subject's capability of response when attempting deception. The examiner instructed the Subject to write a number unknown to the examiner but within a series of 10 numbers,

and then to lie about what number he had written. The examiner employed no trickery or subterfuge in conducting the acquaintance test. The first two questions in the number sequence were not scored, and served to absorb the orienting responses. They were explained as providing the examiner with a sample of the Subject's physiological pattern when he is answering truthfully prior to telling a lie. The last question or two in the number sequence were also padding questions, and were explained as providing a sample of the Subject's physiological pattern when he is answering truthfully following a lie. The next question was, "Did you lie on this test about the number you wrote on that paper?" Subject was instructed to lie by answering "No," so as to provide the examiner a sample of his physiological patterns when the examiner knew he was lying. The Subject was then instructed to answer truthfully all questions that followed. The examiner then identified the number the Subject had selected by asking, "Did you write the number ___ on that paper?"

An example of how the acquaintance test was administered is as follows:

1. Regarding the number you wrote on that paper, did you write the number 1? No.
2. Did you write the number 2? No.
3. Did you write the number 3? No.
4. Did you write the number 4? No.
5. Did you write the number 5? No.
6. Did you write the number 6? No.
7. Did you write the number 7? No.
8. Did you write the number 8? No.
9. Did you write the number 9? No.
10. Did you write the number 10? No.
11. Did you lie to me on this test about the number you wrote on that paper? No.
12. Now answer truthfully all my questions about the number you wrote on that paper.
Did you write the number 6? Yes.

The purpose of this test was to demonstrate the competence of the examiner and to determine whether or not the Subject was, in fact, testable by polygraph at that time. It also served to channel the reactivity of the truthful subject to the control questions and that of the deceptive subject to the relevant question to which he intended to lie during the relevant testing. After completion of the acquaintance test, the Subject was shown his polygraph chart and the critical reactions were pointed out to him, whereupon he executed the Special Polygraph Research Examination Consent Statement and Privacy Act Advisement Form (Appendix E).

The examiner next reviewed the biographical data sheet with the Subject item by item. No attempt was made to question or interrogate the Subject.

The CIST is derived from the federal version of the zone of comparison test. Differences include the use of directed lie control questions (DLCQ) instead of probable lie control questions, and the inclusion of non-related relevant questions. A DLCQ can be defined as a question to which the subject has agreed to lie and to which the examiner knows that the subject is lying. The DLCQ was introduced as follows:

Examiner: "I am now going to ask you a question that will become a very important part of the test. I want you to answer this question truthfully, but I don't want you to give me any details. Do you understand what I want you to do?"

Subject: "Yes I do."

Examiner: "Then my question is this: 'Have you ever lied to your wife about anything?'"

Subject: "Yes, I have."

Examiner: "During the test I will ask you the question, 'Have you ever lied to your wife?' I want you to answer that question by saying, 'no.' You know that a NO answer will be a lie and I know the answer will be a lie, but your lying in answering this question will play an important part in this polygraph test. Do you understand what I want you to do?"

Subject: "Yes, I do."

Examiner: "Now let us practice this question. Did you ever lie to your wife?"

Subject: "No."

The CIST format used in this study consisted of 13 questions, with relevant questions at 5, 6, 8, 9, and 12. DLCQs were at 4, 7, 10, and 13.

Symptomatic questions were at 3 and 11. Question 1 was an irrelevant question and question 2 was a sacrifice relevant question. All relevant and symptomatic questions were the same for all subjects, but control and irrelevant questions were tailored to fit each subject. A typical test sequence was as follows:

1. (Irrelevant) Is today 7 August 1979?
2. (Sacrifice relevant) Do you intend to truthfully answer all questions about your background?
3. (Symptomatic) Are you sure I will not ask you any surprise questions on this test?
4. (DLCQ) Have you ever driven a car after using alcoholic beverages?
5. (Relevant) Did you put false information about your date of birth on that form?
6. (Relevant) Did you put false information about your education on that form?
7. (DLCQ) Have you ever lied to your parents?
8. (Relevant) Did you put false information about your place of birth that form?
9. (Relevant) Did you put false information about your employment on that form?
10. (DCLQ) Have you ever lied to make yourself look good to someone else?
11. (Symptomatic) Are you afraid I will ask you a question on this test about something we have not discussed?
12. (Relevant) Did you put false information about your residences on that form?
13. (DLCQ) During the past three months, have you deliberately broken any traffic regulation?

The polygraph test consisted of a minimum of three charts during each of which all questions were asked. If after three charts the examiner was not able to make a decision concerning the subject's truthfulness, he conducted up to three additional charts. If after six charts the examiner still could not make a definite decision, the examiner called the examination inconclusive.

Upon completion of the testing, the examiner explained the purpose of the security pledge and requested the subject to sign the form. The subject was thanked for participating in the study and was excused.

Quantification of the data

Following the tests the examiner evaluated each set of charts using three different methods: the zone method, the greatest control method, and the relevant-irrelevant method in accordance with the detailed instructions contained in Appendix C. The results were recorded on the form shown in Appendix F.

Zone method: Relevant questions were evaluated against the larger of either control question in its zone on a channel by channel basis. Zone one consisted of questions 4, 5, 6, and 7 in which questions 4 and 7 were control questions; zone two consisted of questions 7, 8, 9, and 10 in which questions 7 and 10 were the controls; zone three consisted of questions 10, 12, and 13 in which questions 10 and 13 were the controls. Each physiological measure for each relevant/control question pair was rated on a 7-point scale ranging from plus 3 (clearly truthful to the relevant question) through zero (inconclusive) to minus 3 (clearly deceptive to the relevant question), using interpretive criteria taught at the Polygraph Course, US Army Military Police School. On any chart the scores for any individual question could range between plus or minus nine. The scores for each relevant question were summed across all charts. If the total score was plus three or higher, the subject was called truthful for that relevant question. If the total score was minus three or lower, the subject was called deceptive to that relevant question. If the total question score was between plus or minus two, inclusive, the result for that question was inconclusive. In the event that the greatest reaction on a chart was at one of the symptomatic questions (questions 3 or 11) the chart was considered inconclusive because of an over-riding outside issue.

Greatest control method: The same methodology as in the zone method was used, except that all five relevant questions on a chart were evaluated against the single control question on that chart which had the largest overall reaction. In the event the greatest reaction on the chart was at one of the symptomatic questions, that chart was considered inconclusive because of an over-riding outside issue.

Relevant-Irrelevant method: Each relevant question was evaluated without making reference to the control question. Emphasis was placed on the size and consistency of reactions at the relevant questions. The questions were not scored numerically; rather, the examiner made holistic decisions of

deception indicated (DI), no deception indicated (NDI) or inconclusive based upon his subjective impression of the charts generally. In this method, the purpose of the control questions was seen to allow the subject a place to vent excessive emotionality. In the event the greatest reaction on the chart was at one of the symptomatic questions, that chart was considered inconclusive.

Blind evaluations

The 56 sets of polygraph charts were evaluated by 6 other MI polygraph examiners who had no opportunity to observe the subjects or to gather any other information that might yield a clue concerning the subjects' truthfulness. A copy of the letter of instructions to the reviewing examiners is attached as Appendix G. The accuracy of the blind evaluations has not been analyzed and so is not included in this report.

RESULTS

Accuracy of test results

Twenty-six of the 56 subjects answered all five relevant questions truthfully. The other 30 subjects lied to one of the five relevant questions and answered the other four relevant questions truthfully. The initial series of analyses examined how accurate the three evaluation methods were in categorizing the subjects as either no deception indicated (NDI) or as being deceptive to any of the relevant questions (DI). In the initial analyses, if a subject was in fact deceptive to any relevant question, and he reacted deceptively to any of the questions, it was considered a hit even though the examiner may have misidentified which relevant question the subject was deceptive to. The examiner's accuracy in identifying truthfulness on individual questions is analyzed in a later section.

Zone method: Examiner evaluation of the test charts using the zone method of analysis resulted in an overall accuracy rate of 66% and an error rate of 18% when the inconclusive tests were included. The accuracy rate was 79% when the inconclusive tests were excluded. Including the inconclusives,

Table 1

Accuracy of Examiner's Decisions of Test Results with Zone Method

		<u>Examiner's Decisions</u>			
		NDI	DI	Incl.	Total
<u>Subjects</u>	Truthful	16	5	5	26
	Deceptive	5	21	4	30
	Total	21	26	9	56

=====
 62% of the truthful Subjects were correctly identified and 70% of the deceptive Subjects were correctly identified. Exclusion of the inconclusive cases resulted in accuracy rates of 76% for the truthful Subjects and 81% for the deceptive Subjects. Binomial tests on the accuracy of the decisions (excluding inconclusives) indicated that the zone method was successful in detecting both truthfulness ($p = .013$) and deception ($p < .002$).

Greatest Control Method: Examiner evaluation of the test charts using the greatest control method resulted in an overall accuracy rate of 62% and an error rate of 20% when the inconclusive tests were included. The accuracy

Table 2

Accuracy of Examiner's Decisions of Test Results with Greatest Control Method

		<u>Examiner's Decisions</u>			
		NDI	DI	Incl	Total
<u>Subjects</u>	Truthful	20	4	2	26
	Deceptive	7	15	8	30
	Total	27	19	10	56

rate was 76% when the inconclusive tests were excluded. Including the inconclusives, 77% of the truthful Subjects were correctly identified, but only 50% of the deceptive Subjects were called DI. Exclusion of the inconclusive cases resulted in an accuracy rate of 83% for the truthful Subjects, but only 68% for the deceptive Subjects. The binomial test indicated that the greatest control method was able to detect truthfulness ($p = .001$), but it was unable to detect deception above chance levels ($p = .067$).

Relevant-Irrelevant Method: Examiner evaluation of the test charts with the relevant-irrelevant method of chart interpretation resulted in an overall accuracy rate of 77% and an error rate of 18% when the inconclusive tests were included. The accuracy rate was 81% when the inconclusive tests were excluded. Including the inconclusives, 73% of the truthful Subjects were correctly identified as were 80% of the deceptive Subjects. Excluding the inconclusives,

Table 3

Accuracy of Examiner's Decisions of Test Results with the Relevant-Irrelevant Method

		<u>Examiner's Decisions</u>			
		NDI	DI	Incl.	Total
<u>Subjects</u>	Truthful	19	6	1	26
	Deceptive	4	24	2	30
	Total	23	30	3	56

76% of the truthful Subjects and 86% of the deceptive Subjects were correctly categorized. Binomial tests indicated that the relevant-irrelevant method was able to detect both truthfulness ($p = .007$) and deception ($p < .001$).

Comparison of all methods

Table 4 compares the effectiveness of all three evaluation methods with the truthful Subjects, deceptive Subjects, and all Subjects combined.

Table 4

Comparison of all evaluation methods by examiners on test results

a. Truthful Subjects

	<u>Examiner's Decisions</u>			
	Right	Wrong	Incl	Total
Zone	16	5	5	26
Greatest	20	4	2	26
R-I	19	6	1	26

b. Deceptive Subjects

	<u>Examiner's Decisions</u>			
	Right	Wrong	Incl	Total
Zone	21	5	4	30
Greatest	15	7	8	30
R-I	24	4	2	30

c. All Subjects

	<u>Examiner's Decisions</u>			
	Right	Wrong	Incl	Total
Zone	37	10	9	56
Greatest	35	11	10	56
R-I	43	10	3	56

=====
 Although the chi square test results must be treated with caution with these figures because the rows are not independent of each other, it is interesting to note that the R-I method produced significantly fewer inconclusives in the deceptive Subjects than did the greatest control method (chi square = 6.495, df = 2, p<.05). The same trend approached significance with all Subjects (chi square = 4.637, df = 2, p<.10). When inconclusives were excluded, every evaluation method was able to detect truthfulness and able to detect deception at rates well above chance levels, except that the greatest control method was not able to detect the deceptive Subjects (binomial test, p = .067).

Accuracy of Question Results

The preceding section dealt with the gross identification of truthful and deceptive Subjects. If a Subject was deceptive to question 5 but was called deceptive to question 8, it was scored as a hit. Let us now examine the accuracy of the three evaluation methods in identifying the Subjects' truthfulness on the individual questions. The 26 truthful Subjects were truthful to each of five questions. The 30 deceptive Subjects were each truthful to four questions and deceptive to one question. There were thus 250 questions answered truthfully and 30 questions answered deceptively.

Zone Method: Examiner evaluation of the individual questions using the zone method resulted in an overall accuracy of 75% and an error rate of 10% when the inconclusive results were included. The accuracy rate was 92% when the inconclusive questions were excluded. Including the

Table 5

Accuracy of Examiner's Decisions of Individual Questions

		With the Zone Method			
		<u>Examiner's Decisions</u>			
		NDI	DI	Incl	Total
<u>Questions</u>	Truthful	192	18	40	250
	Deceptive	10	17	3	30
	Total	202	35	43	280

=====
 inconclusives, 77% of the truthful questions and 57% of the deceptive questions were correctly identified. Exclusion of the inconclusive results yielded accuracy rates of 91% for the truthful questions and 63% for the deceptive questions. The zone method was unable to identify the programmed deceptive questions any better than chance ($z = 1.155$; $p = .125$).

Greatest Control Method: Examiner evaluation of the individual questions using the greatest control method resulted in an overall accuracy rate of 81% and an error rate of 6% when the inconclusive questions were included. The accuracy rate was 93% when the inconclusive questions were excluded.

Table 6

Accuracy of Examiner's Decisions on Individual Questions with the
Greatest Control Method

		<u>Examiner's Decisions</u>			
		NDI	DI	Incl	Total
<u>Questions</u>	Truthful	213	7	30	250
	Deceptive	11	13	6	30
	Total	224	20	36	280

=====
 Including the inconclusive questions, 85% of the truthful questions and 43% of the deceptive questions were correctly identified. Exclusion of the inconclusive questions resulted in accuracy rates of 97% for the truthful questions and 54% for the deceptive questions. The greatest control method was totally unable to identify the programmed deceptive questions any better than chance.

Relevant-Irrelevant Method: Examiner evaluation of the individual questions

Table 7

Accuracy of Examiner's Decisions on Individual Questions
With the Relevant-Irrelevant Method

		<u>Examiner's Decisions</u>			
		NDI	DI	Incl	Total
<u>Questions</u>	Truthful	219	20	11	250
	Deceptive	9	20	1	30
	Total	228	40	12	280

using the Relevant-Irrelevant method of evaluation resulted in an overall accuracy rate of 85% with an error rate of 10% when the inconclusive questions were included. The accuracy rate was 89% when the inconclusive questions were excluded. Including the inconclusive questions, 88% of the truthful questions and 67% of the deceptive questions were correctly identified. Exclusion of the inconclusive questions resulted in accuracy rates of 92% for the truthful questions and 69% for the deceptive questions. The relevant-irrelevant method of evaluation was able to identify both the truthful and deceptive questions at levels beyond chance expectation (for the deceptive questions, $z = 1.86$, $p = .031$).

Comparison of all methods: Table 8 compares the effectiveness of all three evaluation methods with the truthful questions, deceptive questions, and all questions combined. With the truthful questions, the relevant-irrelevant method had the fewest inconclusives, whereas the greatest control method had significantly fewer errors than either the zone method (chi square = 5.699, $df = 1$, $p < .02$) or the relevant-irrelevant method (chi square = 5.566, $df = 1$, $p < .02$). The only method of evaluation which was able to successfully identify the deceptive questions was the relevant-irrelevant method (binomial test, $p = .031$).

Error Analysis: Test Results

Of the 56 examinations, 26 (46%) were programmed truthful and 30 (54%) were programmed deceptive. Thus, 46% of all errors would be expected to be false positives (FPs) and 54% would be expected to be false negatives (FNs). The FP/FN ratio would thus be expected to be 0.85/1. As can be seen in table 9, the zone method of analysis gave the closest fit to the theoretical value. Similar analyses on the results for the individual questions were not made because of a lack of time.

Table 8

Comparison of all evaluation methods by examiners on question results

a. Truthful Questions

	<u>Examiner's Decisions</u>			
	Right	Wrong	Incl	Total
Zone	192	18	40	250
Greatest	213	7	30	250
R-1	219	20	11	250

b. Deceptive Questions

Examiner's Decisions

	Right	Wrong	Incl	Total
Zone	17	10	3	30
Greatest	13	11	6	30
R-I	20	9	1	30

c. All Questions

Examiner's Decisions

	Right	Wrong	Incl	Total
Zone	209	28	43	280
Greatest	226	18	36	280
R-I	239	29	12	280

Table 9

FP/FN Error ratios: Test Results

	Total Errors	No. FP	No. FN	FP/FN ratio
Zone	10	5	5	5/5 = 1/1
Greatest	11	4	7	4/7 = 0.57/1
R-I	10	6	4	6/4 = 1.5/1

Error Analysis: Question Results

When analyzing the test errors, it became apparent that most of the question errors were occurring with the deceptive Subjects. Since the deceptive Subjects were answering four relevant questions truthfully and were deceptive to one, both FP and FN errors could occur on the questions. There were a total of 130 questions being answered truthfully by the truthful subject (5 x 26 = 130), and a total of 120 questions being answered truthfully by the deceptive subjects (4 x 30 = 120). Table 10 compares the accuracy of the zone method in identifying the questions being answered truthfully by the truthful and deceptive groups.

Table 10

Accuracy of the Examiner's Decisions in Identifying the Truthful Questions
with the Zone Method

	<u>Examiner's Decisions</u>			Total
	NDI	DI	Incl	
Truthful Subjects	110	6	14	130
Deceptive Subjects	82	12	26	120
Total	192	18	40	250

The differences between the two groups were significant (chi square = 9.298, df = p<.01). The same finding occurred with the greatest control method, but with the relevant-irrelevant method there was no significant difference between the two groups.

Table 11

Accuracy of the Examiner's Decisions in Identifying the Truthful Questions
with the Relevant-Irrelevant Method

	<u>Examiner's Decisions</u>			Total
	NDI	DI	Incl	
Truthful Subjects	120	7	3	130
Deceptive Subjects	99	13	8	120
Total	219	20	11	250

Heart Rate Differences

It was hypothesized that there may have been a difference in the mean heart rate between the truthful and deceptive Subjects. Specifically, it was felt that the deceptive Subjects may have had a faster heart rate than the truthful Subjects. An analysis was therefore made of the mean heart rates for the two groups. The heart rate (HR) of the truthful Subjects ranged from 42 to 90, with a mean of 69.3 beats per minute (BPM). The HR of the deceptive Subjects ranged from 48 to 96, with a mean of 73.2 BPM. The difference approached, but did not reach, significance ($t = 1.30$, $df = 54$; $p < .10$ (1-tailed)). However, it was noted that of the 12 Subjects with a HR of 80 BPM or higher, 10 were deceptive and only two were truthful. This was significant (chi square = 5.439, $p < .02$).

Acquaintance Tests

The examiners involved in the study noted that the acquaintance test seemed less accurate in the study than it seemed in real-life cases. Accordingly, an analysis was made as to how many charts were required for the examiner to correctly interpret the acquaintance test charts. If the examiner's first or second choice was in fact the number selected by the Subjects, only one chart was run. If neither the examiner's first or second choice was correct, the acquaintance test was repeated, requiring more than one chart. An equal number of acquaintance tests conducted in real-life screening tests by each of the three examiners involved in this study was obtained. Table 12 compares the number of cases in which one chart was sufficient for the acquaintance test in both the study and live cases.

The chi square analysis showed that the acquaintance test was significantly

Table 12

Number of Acquaintance Tests Charts Required in Experimental and
Real-Life Examinations

	<u>No. of Charts Required</u>		Total
	1 chart	More than 1 chart	
Experiment	38	18	56
Real-Life	51	5	56
		19	

easier to interpret in real-life examinations than it was in this study (chi square = 9.247, df = 1; $p < .01$). In order to determine whether that result might have been an artifact due to differing rates of truthful or deceptive polygraph outcomes between the two conditions, a comparison was made of the number of acquaintance test charts required in this study, between the truthful and deceptive subjects. Of the 26 truthful Subjects, 17 (65%) required only one chart. Of the 30 deceptive Subjects, 21 (70%) required only one chart. The difference was not significant.

To test the belief that a difficult acquaintance test (i.e., one which required more than one chart) may be associated with a difficult (i.e., inconclusive) or inaccurate polygraph result on the main issue under investigation, a similar comparison was made between the number of acquaintance test charts and the accuracy of the main polygraph test. The results are shown in table 13. The differences were significant (chi square = 6.55, df = 2; $p < .05$).

Table 13

Relationship Between Ease of Acquaintance Test and
Accuracy of Main Polygraph Test Outcome

Accuracy of main polygraph examination	<u>Acquaintance Test</u> <u>No. of charts Required</u>		<u>Accuracy of main</u> <u>polygraph</u> <u>examination</u>
	1 chart	More than 1 chart	
Entirely Correct	22	4	
Entirely Incorrect	6	4	
Inconclusive or partially incorrect	10	10	

DISCUSSION

There are a number of significant findings in this study. Perhaps the single most important is that the CIST format, utilizing directed lie control questions, is able to detect both truthful and deceptive subjects using either the zone comparison or relevant-irrelevant methods of chart analysis.

The CIST was about 80% accurate overall, excluding inconclusive tests. Because of the way the study was designed, it cannot be determined how the CIST compares with other polygraph screening techniques, such as the relevant-irrelevant test, as that would require an additional study.

With the greatest control method of interpreting the charts, all relevant questions were compared to the single greatest control question reaction. It was therefore not unexpected that this method of chart interpretation was very effective in identifying truthful subjects and truthful questions. Because 250 (89%) of the 280 questions in the study were being answered truthfully, the greatest control method had a high overall accuracy rate in this study. It therefore needs to be emphasized that the greatest control method was unable to detect either the deceptive subjects or the deceptive questions at greater than chance levels. Therefore it should not be used in real-life situations unless future research is able to demonstrate that it is able to detect deception.

One of the more intriguing findings was that the polygraph technique as used in this study was less accurate in determining the precise question to which the deceptive subjects were lying than was expected. Backster's theory of psychological set, upon which the control questions test is predicted, states that the subject tends to react the most to that question which presents the greatest threat to his well-being. That is, if a subject is lying to only one of five relevant questions, he should react the most to that question. This did not seem to necessarily be the case in this study. A number of the deceptive subjects reacted more to relevant questions they were answering truthfully than they did to the relevant question to which they were lying. In fact, only the relevant-irrelevant method of chart interpretation was able to correct identify the precise questions the deceptive subjects were lying about at level greater than would be expected by chance alone. There are two hypotheses as to why this result occurred. First, it may be that the deceptive subjects showed a generally higher level of reactivity than the truthful subjects, thereby creating numerous spontaneous reactions which could have made it difficult to identify the precise question being lied about. This hypothesis receives some support from the observation that 10 of the 12 subjects who had the fastest heart rates were deceptive. Unfortunately, time did not permit an analysis to be made of the apparent arousal level observed on the truthful versus deceptive subjects' charts. The second hypothesis is that the deceptive subjects may have reacted to a number of the relevant questions because of difficulty in identifying which relevant question was being asked.

All of the five relevant questions were worded much the same: "Did you put false information about your _____ on that form?" Consequently, the deceptive subjects were able to identify the question as being relevant a second or two before they knew whether it was one they were supposed to lie to or not. In order to avoid that possibility it might be better to have the relevant questions worded in such a way that the deceptive subjects are able to recognize the precise question being asked early in the question. This is not much of a problem in single issue testing where the deceptive subject is lying to all relevant questions, but does seem to have posed a problem in multi-issue screening situation as was the case in this study.

The relevant-irrelevant method of chart interpretation did surprisingly well in this study. There are a number of theoretical reasons why it might be expected to be less precise than the zone comparison method of scoring using control questions, and why it might be expected to produce a disproportionate number of false positive errors. Neither supposition was borne out in this study. The relevant-irrelevant method was just as accurate as the zone comparison method in correctly identifying deceptive subjects, and was in fact the only method of the three used which was able to correctly identify the precise question to which the deceptive subjects were lying. Moreover, it must be mentioned that the number of inconclusive results was minimized using the relevant-irrelevant method, and that the increase in the number of decisions was not made at the expense of increasing the percentage of errors, either false positives or false negatives. In interpreting these results, however, it should be noted that the examiners did not randomize the sequence in which the charts were interpreted. In most cases, the relevant-irrelevant method of chart evaluation was the last of the three evaluations made, a circumstance which would tend to bias the relevant-irrelevant results towards a greater accuracy than it might otherwise have had. Nonetheless, there is some evidence suggesting that the examiners did make an effort to make the three evaluations independently of each other. In theory, the greatest control method of evaluation should have resulted in numerical scores for each relevant question which should always have been equal to or more positive than the scores obtained with the zone comparison method. Yet, there were a number of instances in which the greatest control method resulted in a more negative score than that obtained with the zone comparison method, suggesting that the different evaluations made by the same examiner were somewhat independent of each other.

The heart rate data is of both theoretical and practical importance. No significant difference was found in the mean heart rates of the truthful and deceptive subjects, although the 4 BPM difference did approach significance. The study was conducted in a relatively low-stress environment, judging from the comments made by a number of the subjects when they were later debriefed. Because of the near significance of the 4 BPM, it is possible that in a higher-stress, real-life situation the HR of deceptive subjects may prove to be significantly higher than that of truthful subjects. There was

such a great variability in heart rate within both the truthful and deceptive subjects, however; that the mean heart rate would not be expected to be an effective discriminator. The fact that 10 of the 12 fastest heart rates in the study (those above 80 BPM) were with deceptive subjects seems not only to be of statistical significance, but may have some diagnostic value if such a finding holds up in future research. That is, if a subject's HR is found to be above some empirically determined threshold, perhaps that fact should be incorporated as one of many bits of data upon which a decision of deception (but not truthfulness) should be based. If the HR is below that threshold, that knowledge would at present seem to be of no diagnostic significance. It would be premature to consider 80 to be an appropriate cutoff in real-life situations, although it was effective in this situation. First, any such threshold arrived at a posteriori must be verified in an independent study before it could be utilized for predictive purposes. More importantly, it would seem reasonable that in a higher stress real-life situation the HR of both truthful and deceptive subjects might be higher than in this study. It is therefore impossible to generalize this finding to other situations at present. Nonetheless, this finding suggests additional data should be collected to confirm or disconfirm this result because of its theoretical and practical significance. One of the reasons why the control question method is considered superior to the relevant-irrelevant method is that with the control question technique each subject serves as his own control. Subject's nervousness does not affect his probability of being called truthful or deceptive. Some adherents of the relevant-irrelevant method have contended that a heart rate above some threshold level, often considered to be about 100 BPM in a criminal investigation, is an indicator of deception. Critics of the relevant-irrelevant technique have pointed out that looking at such physiological base levels of arousal could lead to false positive errors and should therefore be excluded from consideration. The two related findings of this study--that the HR was able to discriminate between truthful and deceptive subjects when it exceeds a threshold level, and that the relevant-irrelevant method decreased inconclusives without any significant increase in false positive errors--suggest that is an issue worthy of serious research.

To what extent can the results of this study be generalized to real-life screening situations? Military Intelligence examiners conduct screening tests in a variety of situations involving many different populations. The sample of subjects selected for this study would seem to be representative of American personnel involved in military intelligence duties. Caution is indicated when trying to extrapolate to foreign nationals, especially when the screening involves operational issues rather than biographical background data as was the case in this study.

The accuracy of the polygraph technique as established in this study is perhaps worst case figures. That is, the technique's effectiveness would probably be greater in real-life screening situations for a number of reasons.

First, the examiner was prevented from questioning the subject in this study. In the field situations the examiner would be able to ask subjects why they reacted to any questions; thereby giving them the opportunity to identify sources of concern they might have, thus reducing the number of false positive errors. Second, real-life subjects would be expected to be more emotionally involved with their deception, thereby decreasing the false negative error rate. Third, the deceptive subjects were directed to lie to one of the relevant questions by the Experimenter and were then being directed to lie to the Directed Lie Control Questions by the examiner. It would seem reasonable that having the deceptive subjects directed to lie to both the relevant question and directed lie control questions would weaken the technique in the experimental situation, probably by increasing the false negative error rate. Certainly, the psychodynamics of the subject's lie(s) to the relevant question(s) in a real-life situation would be different. This supposition is supported by the fact that the acquaintance test could be correctly interpreted on the first chart significantly more often within the context of real-life examinations than was the case in this study. That suggests that the polygraph examination may be more accurate in real-life situations.

CONCLUSIONS

It is concluded that within the context of the mock screening paradigm the Counterintelligence Screening Test incorporating Directed Lie Control Questions was about 80% accurate in differentiating between truthful and deceptive subjects when inconclusive results were excluded. There is some evidence which suggests that it may be more accurate in real-life situations than it was in this study. The greatest control method of chart evaluation was unable to detect deceptive subjects and should not be used at this time. The relevant-irrelevant method of chart evaluation was the only one of the three evaluation methods capable of pinpointing the specific questions to which the deceptive subjects were lying, and had the advantage of minimizing inconclusive results without significantly increasing errors.

Additional research should be conducted to compare the effectiveness of the CIST with other polygraph screening techniques such as the relevant-irrelevant test. The polygraph charts used in this study were independently evaluated by other polygraph examiners who did not see the subjects. Additional analyses of the data should be made in order to determine whether the examiners who conducted the examinations may have been influenced to some degree in their interpretation of the charts by what they knew of the subjects' demeanor and behavior patterns. In those cases in which the conducting examiners and reviewing examiners might disagree in their interpretation of the charts; who is more likely to be correct? Such an analysis has obvious implications for the concept of quality control as currently utilized by Military Intelligence

in real-life cases. Finally, additional research is vitally needed to determine whether physiological base level measures of arousal, such as blood pressure, heart rate, and electrodermal resistance levels, can discriminate between truthful and deceptive subjects, since this could affect what physiological data should be considered when making decisions.

ABSTRACT

The Counterintelligence Screening Test (CIST) was developed by Military Intelligence polygraph examiners in 1971. Although it differed from previous polygraph screening techniques in several ways, the most controversial change was the use of the directed lie control question (DLCQ) to serve as a criterion for evaluating the subject's level of reactivity. Neither the validity of the DLCQ nor the validity of the CIST format had been established under controlled conditions. The purpose of this study was to determine whether the CIST can accurately differentiate between truthful and deceptive subjects in a mock screening situation. In addition, three different methods of evaluating the polygraph charts (zone comparison, greatest control, and relevant-irrelevant) were compared to determine which gave the most accurate results.

Fifty-six subjects were given CIST polygraph examinations to determine their truthfulness to five relevant questions concerning their personal background. Ground truth had previously been established by a background investigation. The 56 subjects were randomly assigned to one of two groups: truthful and deceptive. The truthful subjects (n = 26) were instructed to answer all five relevant questions truthfully. The deceptive subjects (n = 30) were instructed to falsify their answer to one of the five relevant questions (selected at random), but to answer the other four relevant questions truthfully. The deceptive subjects were offered \$20 if they could beat the polygraph. The polygraph examiner's task was to determine whether each subject was truthful or deceptive, and if deceptive, to which question(s).

Using the zone comparison scoring system, the examiners correctly categorized 37 (66%) of the 56 subjects, made no decision in 9 (16%) of the cases, and erroneously categorized 10 (18%) subjects (5 false positive and 5 false negative errors). Excluding the 9 inconclusive cases, 79% of the examiners' decisions were correct ($p < .001$). All three chart evaluation methods were able to identify the truthful subjects, but only the zone comparison and relevant-irrelevant methods were able to identify the deceptive subjects at greater than chance levels.

All three evaluation methods were able to correctly identify the individual questions being answered truthfully, but only the relevant-irrelevant method was able to identify the precise questions the deceptive subjects were lying to at greater than chance levels, because the deceptive subjects appeared to be more reactive to several relevant questions.

The results indicated that the CIST technique, incorporating the directed lie control questions, was able to differentiate between truthful and deceptive subjects. However, the greatest control method of chart interpretation was inferior to the zone comparison and relevant-irrelevant methods in that it was unable to identify the deceptive subjects. Overall, the zone comparison and relevant-irrelevant methods appeared about equally useful. The relevant-irrelevant method minimized inconclusive results and was the only evaluation method capable of determining the precise question to which the deceptive subjects were lying, whereas the zone comparison method appeared to give the best FP/FN error ratio. Additional research is needed to assess the accuracy of the CIST technique relative to other polygraph screening formats.

APPENDIX A

BIOGRAPHICAL DATA SHEET

INSTRUCTIONS: Read the certification at the end of this questionnaire before entering the required data. Print or type all answers. All questions must be answered. If the answer is "None" so state.

1. First Name - Middle Name - Last Name			2. Permanent Mailing Address:		
3. Date Of Birth:		4. Place Of Birth:		5. U.S. Citizen: Yes: No:	
Height:	Weight:	Color Of Eyes:	Color Of Hair:		
Present Grade:		<u>MILITARY SERVICE</u>			Date Current Act Duty Started:
		Service and Component:		Organization & Station:	

EDUCATION

<u>Month and Year</u>		<u>Name And Location Of School</u>	<u>Graduate</u>	
From-	To-		Yes	No

EMPLOYMENT

From-	To- (Month & Year)	Name & Address of Employer:

APPENDIX B
SECURITY PLEDGE

SECURITY PLEDGE

Realizing the importance of this Department of Defense directed polygraph research study, I hereby agree not to discuss with anyone, the procedures and instructions given or the questions asked of me during my participation as a volunteer. This is necessary so as to preclude any compromise of the integrity and objectivity of this study.

DATE

SIGNATURE

APPENDIX C
INSTRUCTIONS TO EXAMINERS

REFERENCE OR OFFICE SYMBOL

AGPA-F-OPTP

SUBJECT

Instructions to Examiners Participating in the Validation Study of the Counterintelligence Screening Test

Chief, Polygraph Branch

FROM

Polygraph Study Coordinator

DATE

25 May 1979

CMT 1

References:

- a. DoD Directive 5210.48.
- b. Army Regulation 195-6.
- c. Polygraph Branch SOP.
- d. Memorandum for Deputy Secretary (DA Review Boards Personnel Security), Office of the Undersecretary of Defense, subject: Request for Approval of Polygraph Study, Feb 79.

Technical Division, 902d-MI Group has been directed by paragraph 1d above to conduct a reliability and validation study of the polygraph test format known as the Counterintelligence Screening Test (CIST). The purpose of the research is to determine the validity of the known-lie control question and the polygraph test format known as the Counterintelligence Screening Test (CIST), whether an individual who attempts deception can be accurately identified and whether an individual who does not attempt deception can be accurately identified. Polygraph Branch is tasked to conduct polygraph examinations of approximately 100 volunteers concerning portions of their background utilizing the CIST and within the constraints established by reference paragraph 1 above and to conduct evaluations of polygrams collected during this study. All testing will be accomplished by two selected certified examiners or intern examiners specially trained using the CIST.

Polygraph Testing.

a. Polygraph testing will be conducted in the INSCOM interview rooms located on the third floor of building 4553, Wing B. The television monitoring system will be activated during all testing. When polygraph testing is conducted on female volunteer examinees, the examination must be monitored. It shall not be necessary to monitor examinations conducted on male volunteer examinees.

b. The polygraph examiner, who will not know how the examinee has been programmed, will be introduced to the examinee by the controller in the examination room. During this introduction, the examiner will be furnished the volunteer's biographical data form. After the controller departs from the examination room, the examiner will again explain the purpose of the examination as being part of a reliability and validation study of a polygraph testing technique and request the examinee to execute the special Polygraph Research Examination Consent Statement and Privacy Act Advisement form. The examiner will then give the examinee an explanation of the polygraph test procedures, polygraph instrument, and physiology as it pertains to polygraph. The first chart given will be an Acquaintance Test to determine the examinee's suitability for testing. The examiner may take up to three Acquaintance Tests to determine the examinee's

SUBJECT: Instructions to Examiners Participating in the Validation Study of the Counterintelligence Screening Test

suitability for testing. If, in the examiner's opinion, the Acquaintance Test cannot be interpreted, the examinee will be rescheduled. The examinee may be rescheduled later the same day or on another day at the discretion of the examiner. If the examiner suspects any of the conditions listed in paragraph 1-5, AR 195-6 exist, testing will be terminated and the examinee rescheduled or excused from further participation in the study at the discretion of the examiner.

c. After the examiner has determined the volunteer is a suitable subject for polygraph testing he will review the volunteer's biographical data form with the volunteer.

d. The examiner will take a minimum of three charts during the CIST testing phase, but has the option of taking as many as six charts in order to have collected sufficient data to render a decision. If the examiner collects a polygraph chart, but does not use it in making a determination as to truthfulness or deception, a notation will be placed on the chart with a red felt tip pen indicating that the chart was not used and explaining why. Examples of some of the reasons a chart might not be used in making a decision include but are not limited to the following:

- (1) Polygraph instrument malfunction:
- (2) Excessive outside noise.
- (3) The examinee becoming unsuitable for testing because of being too tired, becoming sick, etc.
- (4) Excessive examinee induced distortion in the chart.

e. The examiner should attempt to resolve all problems that develop during the testing phase and arrive at a conclusion as to deception or non deception of each examinee. If the problem cannot be immediately resolved e.g., the examinee has become too sleepy, the examiner should attempt to reschedule the examinee for further testing after the problem has been corrected. In the event the problem cannot be corrected, the examiner will render a conclusion of "No Opinion" and explain his reasons on the reverse side of the Polygraph Examiner Worksheet form.

f. The polygraph examiner will complete a Polygraph Examiner Worksheet form for each volunteer. Personal information required by the form and the control questions used will be entered on the form. This information may be legibly hand-written in ink or ball point pen. No reference to the examiner's decision will be made on the form if the examiner makes any conclusion other than "No Opinion."

g. After completion of the testing phase, the examiner will inform the examinee that although the charts taken during the testing phase will be evaluated

SUBJECT: Instructions to Examiners Participating in the Validation Study of the Counterintelligence Screening Test

by other examiners, no information will be available to the reviewers to identify him with the charts and that all personal information furnished by the volunteer will be destroyed after completion of their polygraph examination. The examiner will not inform the examinee of his conclusions after completion of testing, but will say that the charts will be evaluated in detail after the examinee has left and that disclosure of the results of the test might have an adverse affect on future volunteers. The examinee will again be informed of the need for the examinee not to discuss the polygraph test with anyone or whether the examinee had been programed to furnish truthful information or false information. At this point the examiner will have examinee read and sign the Security Pledge. The examiner will then thank the volunteer for participating in the study and escort him to stairway leading away from the INSCOM interview rooms. The examiner will then complete the 902d MI Group Forms in accordance with instructions contained in paragraph 4 below, and give the polygraph charts, biographical data form and all forms generated as a result of testing to the study coordinator.

4. Evaluation of polygraph charts.

a. Request each reviewer complete 902d MI Group Forms 54 as indicated below and that examiners sign each form and place his polygraph certificate number after his name. An intern examiner may evaluate charts as part of this study only if he has been specifically trained in the use of the CIST.

b. Evaluate all charts the examiner utilized in making his decision. Charts not used will be so indicated. All examinees will have a minimum of three charts, although some may have as many as six charts taken during the testing phase. Use the attached 902d MI Group Forms 54 to record the results.

c. Conduct an evaluation of each test using an evaluation rating of up to +3 or -3 for each component utilizing criteria taught at USAMPS by a zone method, i.e., relevant questions will be evaluated against either control question in the zone. Zone one will consist of Questions 4, 5, 6, and 7 with Questions 4 and 7 being control questions and Questions 5 and 6 being relevant questions. Zone two will consist of Questions 7, 8, 9, and 10 with Questions 7 and 10 being control questions and Questions 8 and 9 being relevant questions. Zone three will consist of Questions 10, 12, and 13 with Questions 10 and 13 control questions and Question 12 the relevant question. If, in your opinion, the examinee's psychological set to be on the symptomatic questions, 3 or 11, evaluate the entire test as inconclusive and explain your evaluation on the lower right hand corner of 902d Form 54. Use the back of 902d Form 54 to place any comments you may have concerning the charts. Place the word "Zone" on the lower left hand corner of 902d Form 54 to indicate this form reflects your evaluation results using the zone method of evaluation. Indicate in the conclusions section of 902d Form 54 the results of your evaluation of each relevant question e.g., DI: 6; NDI: 5, 8, and 9; INCL: 12. In the event your evaluation results in the examinee being deceptive

SUBJECT: Instructions to Examiners Participating in the Validation Study of the Counterintelligence Screening Test

to more than one relevant question, draw a circle around the number reflecting which question you feel is the question to which the examinee has directed his psychological set. For the purpose of this study an evaluation of +3 is sufficient to declare a question NDI and a -3 is sufficient to declare a question DI.

d. Conduct an evaluation of each test by comparing relevant questions against the strongest control question on each chart utilizing ratings of up to +3 or -3 as taught at USAMPS. Select the control question which in your opinion has the greatest overall reaction, and compare the reaction at all components of this question with the reaction of each relevant question i.e., 5, 6, 8, 9, and 12. If in your opinion, the examinee's psychological set to be on the symptomatic questions, 3 or 11, evaluate the entire test as inconclusive and explain your evaluation on the lower right hand corner of 902d Form 54. Use the back of the form if necessary. Use the back of 902d Form 54 to place any comments you may have concerning the charts. Place the words "Greatest Control" on the lower left hand corner of 902d Form 54 to indicate this form reflects your evaluation results using the greatest control method of evaluation. Indicate in the conclusions section of 902d Form 54 the results of your evaluation of each relevant question, e.g., DI: 6; NDI: 5, 8, and 9; INCL: 12. In the event your evaluation results in the examinee being deceptive to more than one relevant question, draw a circle around the number reflecting which question you feel is the question to which the examinee has directed his psychological set.

e. Conduct an evaluation of each test by evaluating each relevant question without reference to the control questions utilizing the personnel screening techniques with emphasis placed on degree and consistency of response. If, in your opinion, the examinee's psychological set to be on the symptomatic questions 3 or 11, evaluate the entire test as inconclusive and explain your evaluation on the lower right hand corner of 902d Form 54. Use the back of the form if necessary. Use the back of 902d Form 54 to place any comments you may have concerning the charts. Place the letters "PSS" on the lower left hand corner of 902d Form 54 to indicate this form reflects your evaluation results using the personnel security screening method of evaluation. Indicate in the conclusions section of 902d Form 54 the results of your evaluation of each relevant question, e.g., DI: 6; NDI: 5, 8, and 9; INCL: 12. In the event your evaluation results in the examinee being deceptive to more than one relevant question, draw a circle around the number reflecting which question you feel is the question to which the examinee has directed his psychological set.

IAGPA-F-OPTP

25 May 1979

SUBJECT: Instructions to Examiners Participating in the Validation Study of the Counterintelligence Screening Test

5. Request completed 902d Forms 54 and polygraph charts be returned to Technical Division expeditiously to enable the charts to be forwarded to other examiners for their participation in this study.

6. For additional information contact CW4 Diduch, Coordinator.

Stephen C. Diduch

STEPHEN C. DIDUCH
CW4, USA
Coordinator

APPENDIX D

POLYGRAPH EXAMINER'S WORK SHEET

POLYGRAPH EXAMINER'S WORKSHEET

SUBJECT (NO.): _____ DATE: _____

TIME IN: _____ TIME OUT: _____ POLYGRAPH INSTRUMENT USED: _____

NO. OF QTS CONDUCTED: _____ NO. OF RELEVANT TEST CHARTS CONDUCTED: _____

COOPERATIVENESS: YES _____ NO _____

SEX: MALE _____ FEMALE _____ AGE _____ HEIGHT _____ WEIGHT _____ BUILD _____

EDUCATIONAL LEVEL: _____ YEARS

MEDICAL/MENTAL HISTORY: _____

TEST QUESTIONS

ANS.

NO.

1. Is today _____ 1979?
2. Do you intend to truthfully answer all questions about your background?
3. Are you sure I will not ask you any surprise questions on this test?
- 4.
5. Did you put false information about your DOB on that form?
6. Did you put false information about your education on that form?
- 7.
8. Did you put false information about your POB on that form?
9. Did you put false information about your employment on that form?
- 10.
11. Are you afraid I will ask you a question on this test about something we have not discussed?
12. Did you put false information about your residences on that form?
- 13.

APPENDIX E
POLYGRAPH RESEARCH EXAMINATION CONSENT STATEMENT
AND
PRIVACY ACT ADVISEMENT

POLYGRAPH RESEARCH EXAMINATION CONSENT STATEMENT
AND
PRIVACY ACT ADVISEMENT

PLACE:	DATE:	TIME:
EXAMINEE:	UPOB:	

PART I

The purpose of this polygraph examination has been thoroughly explained to me by _____, who informed me that he (she) is a polygraph examiner of United States Army Intelligence. The examiner explained that this statement is being completed in connection with my desire to volunteer for this research polygraph examination. This examination will be limited to verification of my date of birth, place of birth, education, employment and residences as listed on that form. The nature of this examination has been thoroughly explained to me and I understand that I cannot be required to take such an examination without my consent. I was further advised that the examination room does contain an observation device and that the examination will be monitored. Understanding my unqualified right to refuse, I, _____ do hereby, this date, voluntarily and without duress, coercion, unlawful inducement, or promise of reward, consent to undergo this polygraph examination.

EXAMINER: _____ EXAMINEE: _____

PART II - PRIVACY ACT ADVISEMENT

1. AUTHORITY: National Security Act of 1947 (50 USC 493)
2. PURPOSE/USE: Disclosure of personal information relative to this study is voluntary. All personal information concerning you will be destroyed upon completion of the polygraph examination process. Only statistical data will be compiled from the test results and utilized to establish the validity and reliability of the polygraph techniques employed.

DATE: _____ SIGNATURE: _____

APPENDIX F
COUNTERINTELLIGENCE SCREENING TEST
EVALUATION SHEET

CHART I	5	5	5	5	12
PNEUMO					
GALVO					
CARDIO					
SUB-TOTAL					

CHART II	5	6	8	9	12
PNEUMO					
GALVO					
CARDIO					
SUB-TOTAL					

CHART III	5	6	8	9	12
PNEUMO					
GALVO					
CARDIO					
SUB-TOTAL					

QUESTION TOTALS					
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SUBJECT _____ CONCLUSION _____
DATE _____
REVIEWER _____

902d MI Gp Fm 54
dtd 1 Apr 79

APPENDIX G

INSTRUCTIONS TO REVIEWERS



DEPARTMENT OF THE ARMY
US ARMY INTELLIGENCE AND SECURITY COMMAND
SECURITY SUPPORT DETACHMENT FORT HEADE
902D MILITARY INTELLIGENCE GROUP
FORT GEORGE G. HEADE, MARYLAND 20755
TECHNICAL DIVISION

JAGPA-F-OPTP

14 June 1979

SUBJECT: Polygraph Reliability and Validation Study

1. Technical Division, 902d MI Group is conducting the DoD approved polygraph study to determine reliability and validity of a testing format known as the Counterintelligence Screening Test (CIST) for use in a personnel screening situation. Your cooperation is solicited in the conduct of this study. Request that each certified examiner assigned to your office evaluate the study examinations.

2. Specific instructions for evaluating the tests:

a. Evaluate all charts the examiner utilized in making his decision. Charts not used will be so indicated. All examinees will have a minimum of three charts, although some may have as many as six charts taken during the testing phase. Use the attached 902d MI Group Forms 54 to record the results.

b. Conduct an evaluation of each test using an evaluation rating of up to +3 or -3 for each component utilizing criteria taught at USAMPS by a zone method, i.e., relevant questions will be evaluated against either control question in the zone. Zone one will consist of Questions 4, 5, 6, and 7 with Questions 4 and 7 being control questions and Questions 5 and 6 being relevant questions. Zone two will consist of Questions 7, 8, 9, and 10 with Questions 7 and 10 being control questions and Questions 8 and 9 being relevant questions. Zone three will consist of Questions 10, 12, and 13 with Questions 10 and 13 control questions and Question 12 the relevant question. If, in your opinion, the examinee's psychological set is on the symptomatic questions, 3 or 11, evaluate the entire test as inconclusive and explain your evaluation on the lower right hand corner of 902d Form 54. Use the back of the form if necessary. Use the back of 902d Form 54 to place any comments you may have concerning the charts. Place the word "Zone" on the lower left hand corner of 902d Form 54 to

SUBJECT: Polygraph Reliability and Validation Study

indicate this form reflects your evaluation results using the zone method of evaluation. Indicate in the conclusions section of 902d Form 54 the results of your evaluation of each relevant question e.g., DI: 6; NDI: 5, 8, and 9; INCL: 12. In the event your evaluation results in the examinee being deceptive to more than one relevant question, draw a circle around the number reflecting which question you feel is the question to which the examinee has directed his psychological set. For the purpose of this study an evaluation of +3 is sufficient to declare a question NDI and a -3 is sufficient to declare a question DI.

c. Conduct an evaluation of each test by comparing relevant questions against the strongest control question on each chart utilizing ratings of up to +3 or -3 as taught at USAMPS. Select the control question which in your opinion has the greatest overall reaction, and compare the reaction at all components of this question with the reaction of each relevant question i.e., 5, 6, 8, 9, and 12. If, in your opinion, the examinee's psychological set to be on the symptomatic questions, 3 or 11, evaluate the entire test as inconclusive and explain your evaluation on the lower right hand corner of 902d Form 54. Use the back of the form if necessary. Use the back of 902d Form 54 to place any comments you may have concerning the charts. Place the words "Greatest Control" on the lower left hand corner of 902d Form 54 to indicate this form reflects your evaluation results using the greatest control method of evaluation. Indicate in the conclusions section of 902d Form 54 the results of your evaluation of each relevant question, e.g., DI: 6; NDI: 5, 8, and 9; INCL: 12. In the event your evaluation results in the examinee being deceptive to more than one relevant question, draw a circle around the number reflecting which question you feel is the question to which the examinee has directed his psychological set.

d. Conduct an evaluation of each test by evaluating each relevant question without reference to the control questions utilizing the personnel screening techniques with emphasis placed on degree and consistency of response. If, in your opinion, the examinee's psychological set to be on the symptomatic questions, 3 or 11, evaluate the entire test as inconclusive and explain your evaluation on the lower right hand corner of 902d Form 54. Use the back of the form if necessary. Use the back of 902d Form 54 to place any comments you may have concerning the charts. Place the letters "PSS" on the lower left hand corner of 902d Form 54 to indicate this form reflects your evaluation results using the personnel security screening method of evaluation. Indicate in the conclusions section of 902d Form 54 the results of your evaluation of each relevant question, e.g., DI: 6; NDI: 5, 8, and 9; INCL: 12. In the event your evaluation results in the examinee being deceptive to more than one relevant question, draw a circle around the number reflecting which question you feel is the question to which the examinee has directed his psychological set.

14 June 1979

IAGPA-F-OPTP

SUBJECT: Polygraph Reliability and Validation Study

3. Request each reviewer sign each 902d Form 54 completed in the space provided on the lower left hand corner of the form. Request the reviewer be a certified polygraph examiner and his certificate number be placed after his signature. Request that only polygraph examiners who were either trained at the US Army Military Police School (USAMPS) or who are thoroughly familiar with test evaluation techniques taught at USAMPS participate in this study. Request examiners who participate in this study evaluate all polygraph tests taken during the study.

4. Request completed 902d Forms 54 and polygraph charts be returned to Technical Division expeditiously to enable the charts to be forwarded to other examiners for their participation in this study.

5. For additional information contact CW4 Diduch; Coordinator, Phone: 677-8583/4026.

STEPHEN C. DIDUCH
CW4, USA
Coordinator