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CONTRIBUTIONS OF PHYSIOLOGICAL RECORDINGS IN THE POLYGRAPH TECHNIQUE

By

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While the polygraph profession has generally accepted that monitoring three physiological systems is better than monitoring one or two systems, it was not until 1975 that a study was conducted which actually evaluated the relative accuracy of each parameter independently (Slowik, Buckley 1975). In 1988 a study was conducted which duplicated the Slowik Buckley methodology, but which utilized numerical scoring (Ryan, 1988) - a procedure introduced by Backster in 1959 and which is considered by some examiners to increase the reliability of chart analysis (Raskin et al., 1978). In addition, other researchers, primarily using laboratory study designs have reported on the accuracy of individual physiological parameters in the context of detection of deception (Cutrow et al., 1972, Kircher, 1983, Raskin et al., 1978, Thackery et al., 1968).

There is a current interest within the detection of deception field to computerize polygraph chart interpretation. Statistical evaluation of polygraph records is certainly not a new concept and was first introduced for respiratory patterns by Benussi(1914). In 1958 research was published regarding statistical analysis of the cardiovascular recording (Hathaway and Hanscom). Szucko applied statistical analysis to all three parameters and found accuracies above chance levels (1981). Unfortunately, he used student trainees to administer polygraph examinations to college students who had committed a mock crime. As a result, this procedure provided a very poor and inadequate data base for analysis. In addition, by not allowing the examiners who reviewed the charts to render inconclusive opinions, and by requiring examiners to reach their conclusions on the basis of evaluating only one polygraph test (33% of the available data), Szucko did not duplicate field procedures in his study design.

The present study was conducted to evaluate the relative accuracy of thoracic and abdominal respiration, electrodermal resistance, and cardiovascular changes under field conditions in a manner which would provide data for computerized evaluation. The testing format utilized in all of the polygraph examinations in this study was the Reid Control Question Technique. In the context of "computerized chart interpretation" a distinction should be made between using the computer as a sophisticated calculator to generate findings based on human measurements of physiological responses, referred to as a semi-objective computer analysis, as opposed to a totally objective computer evaluation which involves a system whereby the computer not only calculates values of responses, but also measures and identifies significant arousal. In light of this distinction, it should be pointed out that this research is intended to contribute to the existing findings of semi-objective computer analysis of polygraph records.

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Within the control question technique, autonomic arousal is evaluated as a function of the proportion of arousal occurring to either relevant or control questions. The concept that a polygraph subject will psychologically focus his attention to those questions which present the greatest threat to his goal of the examination is the principle behind chart interpretation guidelines utilized by all control question techniques (Jayne, 1986). The theory relied upon in developing the methodology for this study takes this concept a step further, and involves comparing responses to relevant and control questions to the subject's "response potential". A response potential represents the subject's greatest degree of autonomic arousal to a test question asked during the course of a polygraph test (a single presentation of test questions). This approach to chart interpretation is similar in theory to the horizontal scoring system developed by Gordon and Cochetti (1987) and the rank order scoring system research by Honts and Driscoll (1988).

The calculations utilized in this study, while somewhat cumbersome, represent an attempt to obtain as objective a measure of chart responses as possible, and at the same time eliminate two criticisms of conventional numerical scoring - the use of adjectives to describe the significance of a response (somewhat larger, much larger, etc.), and the use of a seven point scale (-3 to +3) for scoring, wherein the examiner can greatly influence the final numeric outcome of a chart by assigning either 2's or 3's to relevant questions.

SAMPLE COLLECTION

The population studied in this research consisted of individuals who were administered specific issue polygraph examinations between 1986 and 1988 by licensed examiners employed by John E. Reid and Associates, Inc. All of the cases used in this study were verified through a corroborated confession. The polygraph instruments used to record the subject's physiological changes mechanically monitored two respiratory channels, cardiovascular changes, and, in the majority of the cases, also monitored unobserved muscular movements. In addition to the above, relative changes in electrodermal resistance was recorded. The control questions used for all of these examinations were non-exclusive crime specific.[1]

Polygraph records were excluded from this population if the initial examiner reported that the subject engaged in acts of purposeful non-cooperation throughout the examination. The reason for excluding these subjects was that due to the distortions in the recordings, meaningful analysis of autonomic arousal cannot be made.

To select a sample of 50 verified truthful polygraph charts and 50 verified deceptive polygraph charts, a central list from the files of John E. Reid and Associates was made which included every verified opinion between the dates of January 1, 1986 and December 31, 1988. The first 50 truthful subjects on that list as well as the first 50 deceptive subjects who satisfied the sample requirements, i.e., where confession verified and did not purposefully distort their polygraph tracings, were included in this study.

METHODOLOGY

After all subject identification on the 100 sets of polygraph charts selected for analysis was concealed, the charts were given to three reviewing examiners, each of whom had been trained in the Reid Control Question Technique, who then independently and blindly evaluated each chart. The examiners completed a separate data sheet for each test they evaluated. To make their evaluations the examiners measured, to the nearest millimeter, the response duration of significant respiratory and cardiovascular responses, as well as the height of significant electrodermal responses occurring on the relevant and control questions for each of the three or four tests contained within each subject's polygraph chart. In addition to the above mentioned quantitative evaluation of the polygraph charts, each examiner rendered an opinion of the subject's truthfulness based on numerical scoring of the polygraph charts.[2]

The Reid Control Question Technique utilizes three relevant questions which address the specific issue under investigation, and in some instances, a fourth relevant question which addresses a broader issue, but one similar to the issue under investigation. For example, in a case involving the theft of a $4000 deposit from a bank, the first three relevant questions would address whether or not the subject stole the missing $4000 deposit, while the fourth relevant question might investigate whether the subject knew who stole the missing $4000. This broader fourth question is a secondary relevant question and can be used diagnostically as a control question during chart interpretation (Reid and Inbau, 1977). In addition to the relevant questions, the Reid technique uses 2 control questions and 4 irrelevant questions.

After the 3 examiners completed data sheets on each of the 100 charts, the examiner's measurements of the subject's autonomic arousal were entered into a computer and the following calculations were made. The greatest measurement within each parameter on each test was used as the subject's response potential for that particular parameter on that test. This response potential could occur on either a relevant or a control question. On each test the measurements for the relevant and control questions were subsequently compared to the response potential, and a percent of the response potential was calculated. For example, if the measurement of the GSR response on the first relevant question was 25 mm., and the response potential within the GSR parameter for that test was 75 mm., 25 mm. is 33% of 75 mm. and therefore that particular GSR response would be 33% [25/75 x 100]. After each measurement was expressed as a percent of the response potential, the relevant questions were then compared to the corresponding control question, and the arithmetic difference between the relevant and control question was calculated. If the percent difference on the control question was larger than the percent difference on the relevant question, a positive difference was assigned to the relevant question. For example, if the percent difference for the GSR parameter on the second relevant question was 33% and the percent difference for the GSR parameter on the corresponding control question was 84%, the GSR for the second relevant question would be assigned a +51% measurement (84-33). On the other hand, if the percent of difference was greater on the relevant than the control question, a negative difference was assigned to that parameter (see Appendix I).

To collect the final data for each subject the percent differences for each parameter were summed across all of the tests administered providing a single value for each parameter. For each relevant question, the two respiratory parameters were averaged and that average was added to the total GSR and cardiovascular measurements to provide a single value for each relevant question. The total values for the first three relevant questions were then summed and divided by the number of tests administered during the examination to provide a total score for the chart.

The previously mentioned fourth relevant question was not included in this calculation because this question can diagnostically be used as a control question and does not necessarily address the specific issue under investigation.

RESULTS

RELIABILITY OF EXAMINER MEASUREMENTS

To evaluate the correlation between the three examiner's quantitative measurements of the 100 polygraph charts evaluated, a Pearson's r calculation was made within the total scores for each parameter, as well as the cumulative score for each chart. To calculate an average r, a z to r table was used. These findings are listed in Table A.

Table A
Correlation Between Examiner's Evaluations

	RESPIRATION	GSR	CARDIO	TOTAL
EXAMINER 1 - 2	.82	.83	.73	.85
EXAMINER 1 - 3	.67	.78	.66	.75
EXAMINER 2 - 3	.67	.75	.69	.75
AVERAGE	.73	.79	.68	.75

A one-tail t-test of each r value indicated no significant difference between the agreement of the three examiner's measurements in any parameter at $p < .01$.

On the other hand for examiner's numerical scoring of the charts, the agreement of opinions for the three examiners was 85%, where the criteria of agreement was complete consensus between conclusive opinions, e.g., if one of the three examiner's conclusive opinion disagreed with either of the other two examiner's opinion, this was considered a disagreement.

ACCURACY OF OVERALL OPINIONS

NUMERICAL SCORING OF CHARTS

Table B indicates the number of correct, incorrect and inconclusive opinions for the three examiners utilizing numerical scoring of the 100 polygraph charts selected for this study.

Table B
NUMERICAL SCORING OF POLYGRAPH CHARTS

	TRUTHFUL			DECEPTIVE		
	CORR.	INCORR.	INCONCL.	CORR.	INCORR.	INCONCL.
EXAMINER 1	40	6	4	41	1	8
EXAMINER 2	43	5	2	50	0	0
EXAMINER 3	40	2	8	32	8	10
AVERAGE %	82%	9%	9%	82%	6%	12%

QUANTITATIVE SCORING OF CHARTS

The quantitative measurements of all three examiners were evaluated to identify optimum cut-off levels for making truthful, deceptive and inconclusive opinions. The cut-off scores between truthful and deceptive opinions were identified through analysis of a frequency distribution table generated from the examiner's combined scores at the point where there appeared to be a natural break between truthful and deceptive subjects. In between these two scores, (the inconclusive range) the frequency of truthful and deceptive results were approximately equal. The cut-off scores used in this analysis were below -80 percent difference for deception, and above -21 percent difference for truthful subjects.[3]

Table C lists the number of correct, incorrect, and inconclusive opinions for the three examiners using the previously mentioned cut-off scores.

Table C
QUANTITATIVE EVALUATION OF TOTAL CHART SCORES

	TRUTHFUL			DECEPTIVE		
	CORR.	INCORR.	INCONCL.	CORR.	INCORR.	INCONCL.
EXAMINER 1	36	10	4	43	4	3
EXAMINER 2	43	4	3	48	0	2
EXAMINER 3	43	5	2	36	9	5
COMBINED %	81%	13%	6%	85%	9%	6%

A chi-square analysis comparing numerical scoring of the polygraph charts and scoring through quantitative measurements did not produce significant differences for any of the three examiners at $p < .05$, $v = 2$.

CONTRIBUTIONS OF INDIVIDUAL PARAMETERS

To evaluate the contribution of each parameter, the median rank score of each parameter was identified and used as a cut-off point. Consequently, half of the scores fell above this point and the other half fell below that point, allowing for no inconclusive opinions. This procedure was used to apply a universal criteria to all parameters so that direct comparisons between different parameters could later be made. Table D lists the average

scores for these findings for respiration, electrodermal resistance, and cardiovascular responses where the calculation of accuracy reflected the number of deceptive subjects with a score lower than the median and the number of truthful subjects with a score higher than the median. Using the median as a cut-off level results in zero inconclusive decisions and, therefore, the accuracy levels reflected in this table is comparable to considering inconclusive results as errors.

Table D
AVERAGE ACCURACIES FOR EACH PARAMETER

	DI MEAN	NDI MEAN	MEDIAN	% ACCURACY
RESPIRATION	- 77	77	- 8	84%
ELECTRODERMAL	- 49	10	-20	85%
CARDIOVASCULAR	- 75	24	-36	77%

FINDINGS[4]

RELIABILITY

The average inter-rater agreement for total quantitative scores between the three reviewing examiners was r = .75. The highest agreement was within the GSR parameter (r = .79) and the poorest agreement was within the cardiovascular parameter (r = .68). The examiner's agreement utilizing numerical scoring of the polygraph records was 85%. The high r value for GSR can probably be attributed to the low utility of that parameter, which contributed only 24% of the total measurable responses for truthful and deceptive subjects. Consequently with many zero measurements, one would expect a higher correlation.

ACCURACY

Excluding inconclusive opinions, numerical scoring of the polygraph charts produced an average accuracy of 92%, with a slight bias toward false positive results (3%). On the other hand, excluding inconclusive opinions, the accuracy of quantitative measurements, using a -80 to -21 cut-off score averaged 89%, with a 2% false positive bias. Numerical scoring resulted in a slightly higher inconclusive rate (7.3%) than quantitative measurements (6.3%). The differences in accuracy, inconclusive results and distribution of false positive and false negative errors between quantitative evaluation and numerical scoring was not statistically significant.

PARAMETERS

Averaging the examiner's quantitative results, and using median as a cut-off score, the respiration parameter produced the highest accuracy (84%) followed by the cardiovascular parameter (77%). The GSR produced the lowest average accuracy (65%). A chi-square analysis of the combined results yielded significant differences between all three parameters: (Resp - GSR = 28.5; Resp - Cardio = 5.10; GSR - Cardio 9.88). A goodness of fit

calculation, however, indicated that all three parameters produced significant results above chance levels (Resp x^2 = 78; Cardio x^2 = 46; GSR x^2 = 14).

Using the median as the criteria for a cut-off score provided a relative measure for each parameter, however did not necessarily represent the maximum possible accuracy within each parameter because there was no margin for inconclusive decisions. To provide a better estimate of the actual accuracy of each parameter, all three examiner's scores were combined and cut-off points were established which maximized accuracy and minimized inconclusive results within each parameter. The cut-off values used were -30 to +9 for respiration, -74 to -20 for GSR, and -49 to -1 for cardiovascular. The findings expressed in percentages using these cut-off points are listed in Table E.

Table E
OPTIMUM ACCURACIES FOR EACH PARAMETER

PARAMETER	TRUTHFUL			DECEPTIVE		
	CORR.	INCORR.	INCONCL.	CORR.	INCORR.	INCONCL.
RESPIRATION	75%	12%	13%	78%	11%	11%
GSR	69%	18%	13%	51%	35%	13%
CARDIO	70%	15%	15%	70%	13%	17%
COMBINED	71%	15%	14%	66%	20%	14%

When inconclusive opinions are excluded, the optimum accuracy for respiration was 87%. The GSR produced an optimum accuracy of 69%, and the optimum accuracy for cardiovascular was 83%. The respiration and cardiovascular measurements yielded no significant difference in accuracies between truthful and deceptive subjects. However, the GSR measurements yielded a false negative error rate of 41%, as well as a 21% false positive error rate. The difference between false positive and false negative error rates for the GSR was statistically significant (x^2 = 12, v = 1).

APPROPRIATE WEIGHT FOR EACH PARAMETER

As previously indicated, the three parameters each produced an independent accuracy which was significantly different from the other two parameters. This finding would suggest that the overall accuracy of chart interpretation should be improved if each parameter contributed a different weight to the total score. To test this theory, the combined results of the three examiner's measurements were re-evaluated, multiplying each parameter by a factor of its independent accuracy. From the previous table the following percentages were selected: Respiration = 87%; GSR = 69%; Cardio = 83%. The findings listed in Table F, under the heading of "adjusted findings," indicate the effect of this manipulation which is compared to unadjusted findings where each parameter was multiplied by 1.0. (ACC = Accuracy; INC = Inconclusive)

Table F
ACCURACY OF TOTAL SCORES COMPARING UNADJUSTED TO ADJUSTED SCORES

	CUT-OFF	NDI ACC.	NDI INC.	DI ACC.	DI INC.
UNADJUSTED	-21 to -80	87%	6%	91%	7%
ADJUSTED	-16 to -65	88%	6%	90%	7%

Adjusting each parameter by a factor of its accuracy did not significantly affect the results in any way. To determine whether or not multiplying a parameter by a numeric factor had any significant effect on the accuracy of quantitative evaluation of these records, 30 different permutations of numeric factors ranging from 90% to 10% were tested. Using the median as a cut-off score, the accuracy ranged from 86.67% to 80.67%. None of the permutations yielded an accuracy which was statistically different from unity (assigning a value of 1 to each parameter).

CONCLUSIONS

This research, involving quantitative analysis of 300 evaluations of 100 verified field polygraph records, indicates that respiration, electrodermal, and cardiovascular parameters each provide significant discrimination between truthful and deceptive subjects. Further, the combined evaluations of these three parameters provided an accuracy and conclusive rate which was higher than the analysis of any individual parameter. The respiration parameter yielded the most consistent and accurate discrimination between truthful and deceptive subjects. There was no significant different between false positive and false negative errors in the respiration or cardiovascular parameters. On the other hand, the GSR produced the greatest number of errors, the highest overall inconclusive rate, and had a statistically significant rate of false negative errors.

In an attempt to optimize the accuracy of the quantitative results, the total score of each parameter was multiplied by a factor of its independent accuracy. This procedure, however, did not significantly affect the accuracy of quantitative evaluations. After testing a wide range of different variables, it was determined that none of the permutations produced results which were significantly higher, or lower than unity.

DISCUSSION

The results of this research lend further support to the existing literature which indicates a high level of accuracy for field polygraph examinations. Especially examiners #1 and #2 used in this research produced results which, in general, were a little higher than other research using Reid charts and Reid examiners (Horvath and Reid, 1971, Hunter and Ash 1971, Wicklander and Hunter, 1975, Slowik and Buckley, 1975). One possible explanation for this finding is that both of these examiners were initially trained in a quantitative chart interpretation technique and consequently had utilized the same guidelines used in this research for three years. The third examiner, as well as the other examiners used in previous Reid studies, was initially taught a visual inspection technique for chart

interpretation. Consequently, quantitative measurements of chart responses, whether applied to numerical scoring or computer analysis, was a new procedure for this examiner.

The finding which was most unexpected was that the GSR parameter produced a significant number of false negative errors. This finding warrants further research to investigate whether or not this is the result of the psychophysiological nature of the GSR parameter, or perhaps the result of using the subject's response potential as a criteria for comparison. The low utility of the GSR finding in this study may also be a factor which distorts this finding.

Another finding which was not anticipated was the failure to affect the accuracy of quantitative evaluations by increasing or decreasing the weight given to different parameters within the evaluation. This finding appears to be incongruous with the finding that the accuracy for each parameter was significantly different when compared to the other two parameters. One possible explanation for this result is that many of the subjects who were incorrectly diagnosed as either telling the truth or not telling the truth quantitatively, had very low or very high total scores which would not be significantly influenced by weighting the parameters. In other words, the scores for a substantial number of subjects who produced erroneous results were not clustered around the median where their results could be influenced by assigning different weights to parameters. This finding refutes the belief held by some examiners that the accuracy of the polygraph technique is increased when numerical scores are greater. The findings from this study suggest that, at least outside of a certain range, that the accuracy of an examiner's opinion is not a function of the total numerical score obtained through chart interpretation.

At the outset of this research a fundamental question surfaced as to whether or not statistical analysis of polygraph records would produce a higher accuracy than human analysis of the same polygraph records. Two of the three examiners used in this study were more accurate in chart interpretation when they used numerical evaluation and the third examiner's accuracy was essentially the same between numerical or quantitative evaluations.

This finding, however, should not discourage the efforts of further research in the area of computerized evaluation of quantitative measurements; it does suggest that a simple factorial formula may only be part of the answer to optimize computer chart interpretation. To improve computer accuracy above human evaluation may require that further variables enter into the formula such as the distribution of responses across different tests or different types of questions, or perhaps intrinsic subject variables should enter into the equation.

It should be pointed out that the findings from this research may be limited in generalization to other techniques which differ from the Reid procedure. Perhaps one of the next steps in researching this area is to evaluate the generalization of these procedures by applying the same mathematical calculations and chart interpretation principles to techniques which are different from the Reid Control Question Technique such as the Zone Comparison technique.

Footnotes

[1] A non-exclusive crime specific control question is one which addresses the subject's past acts which are similar to the issue under investigation and also cover the subject's entire lifetime.

[2] The numerical procedure utilized by the reviewing examiners consisted of a -1, 0, or +1 score assigned to each relevant question, with no predetermined cumulative cut-off point. The final determination of the subject's truthfulness was based on the distribution and trend of plus or minus responses. For a thorough discussion of this procedure, see The Complete Polygraph Handbook, Abrams, 1989.

[3] These figures of -80 and -21 are totaled % differences for responses occurring between relevant and control questions. Therefore the unit of measurement is percent different. To simplify reading, future reference to total scores will simply reflect the numbers.

[4] Unless otherwise indicated, the level of significance for all statistical tests is $< .05$.

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APPENDIX I

	TEST 1			TEST 2			TEST 3			TOTAL
	mm	%	Dif	mm	%	Dif	mm	%	Dif	
R1	20	74%	+26	34	100%	-35	12	67%	+33	+24
R2	18	72%	+28	34	100%	-51	11	69%	+31	+ 8
RQ 1 GSR	36	100%	0	22	100%	-18	26	65%	+20	+ 2
CARDIO	37	100%	-24	8	42%	- 6	14	61%	+59	+29
R1	15	56%	+44	12	35%	+30	9	50%	+50	+124
R2	12	48%	+52	8	20%	+29	9	56%	+44	+125
RQ2 GSR	14	39%	+61	20	91%	- 9	40	100%	-15	+ 37
CARDIO	23	62%	+14	19	100%	-70	23	100%	0	- 56
R1	27	100%		22	65%		18	100%		
R2	25	100%		20	49%		16	100%		
CQ1 GSR	36	100%		18	82%		34	85%		
CARDIO	28	76%		7	36%		23	100%		
R1	16	59%	+11	11	32%	+27	5	28%	+28	+66
R2	16	64%	+12	9	22%	+22	0	0%	+63	+97
RQ3 GSR	12	33%	0	0	0%	0	0	0%	+15	+15
CARDIO	6	16%	-16	8	42%	+11	5	22%	+26	+21
R1	19	70%		20	59%		10	56%		
R2	19	76%		18	44%		10	63%		
CQ2 GSR	12	33%		0	0%		6	15%		
CARDIO	0	0%		10	53%		11	48%		

The above table illustrates the calculations used in the quantitative evaluations made in this study. The response potential for thoracic respiration on the first test occurred during the first control question (27 mm) whereas the response potential for the cardio parameter on that test occurred during the first relevant question. The column labels (%) indicates what percent of the response potential each of the parameter measurements represented. The (Dif) column is the arithmetic difference between the percent of potential where the first 2 relevant questions (RQ1 and RQ2) were compared to the first Control question (CQ1) and the third relevant question (RQ3) was compared to the second control question (CQ2). If the percent difference was larger on the control question than the relevant question, a positive value was assigned and, conversely, if the percent difference was greater on the relevant than control question, a negative difference was assigned. The scores for all three tests were summed, the respiration parameters average, and the total scores for the three relevant questions was divided by the number of tests administered. In this example, the total chart score was +90 (RQ1 = 47 + RQ2 = 106 + RQ3 = 118)/3.

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LAW ENFORCEMENT POLYGRAPH PROCEDURES

By

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During the past 25 years, the polygraph profession has been the focus of growing criticism in the media and the legislative arena. In 1964, the target of the Moss Committee Hearings was Federal Government use of polygraph. Listening closely to the criticisms that were advanced, federal officials increased the professionalism of their effort by putting into place standards and control which have become a model for our profession.

As a result, federal use of polygraph was saved.

This defeat caused the anti-polygraph forces to focus their efforts against our private sector colleagues who, because they lacked organization, were a more vulnerable target. In 1988 they achieved success in the form of "The Employee Polygraph Protection Act of 1988".

It is a reasonable assumption that law enforcement use of polygraph will be the next target!

Law Enforcement must follow the lead of our federal colleagues. We must develop the organization and standardization the private sector lacked. We must demonstrate our professionalism, our human concern, and our compliance with the highest possible principles of practice.

Formalized procedures within the law enforcement community must be adopted which embody the highest standards of our profession. These procedures must recognize our inherent limitations, prevent the misuse of our work product, and in particular, protect the civil rights and well-being of those we test.

The following is presented only as a guide. No procedure can be devised which will answer the needs of every possible situation. Basic concepts, however, must be formally adopted and generally observed by all law enforcement agencies if polygraph is to continue in its valuable contribution within the justice system.

SUBJECT: POLYGRAPH PROCEDURES

I. PURPOSE

To establish guidelines and policy for the use of polygraph in support of the investigative activities of the polygraph department.

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II. DISCUSSION

Polygraph will be used as an investigative tool in the resolution of criminal cases, internal affairs investigations, and other matters reasonably within the jurisdiction of the police department. Polygraph will serve as an adjunct to, but not a substitute for, other investigative efforts. Examinations shall be conducted for the purpose of determining the veracity of the person tested regarding the issue under investigation, and to arrive at the truth concerning that issue.

III. PERSONNEL QUALIFICATIONS:

A. Personnel assigned as polygraph examiners shall:

1. Have successfully completed a basic course of polygraph instruction at a recognized polygraph school;[1]

2. Maintain and demonstrate proficiency as an examiner by having conducted not less than fifty (50) polygraph examinations during the previous twelve (12) month period, and satisfy established quality assurance procedures in the conduct of those examinations;[2]

3. Completed not less than twenty four (24) hours of training in advanced polygraph techniques and instrumentation presented by a state or national level polygraph organization or recognized polygraph school during the previous twelve (12) month period;

4. Obtain and maintain a license or certification to perform polygraph examinations granted by the agency designated by law to issue such license or certification if required, and;

5. Conduct his official duties in a manner which reflects the highest standards of ethical conduct as a polygraph examiner and as a peace officer.

IV. EQUIPMENT:

A. Polygraph instruments used shall be of commercial manufacture, and shall have not less than three (3) functioning recording channels.

B. Instruments shall record, as a minimum, respiratory activity, galvanic skin resistance or conductance, and cardiovascular activity.

C. Procedures outlined by the instrument manufacturer will be followed on a regularly scheduled basis to insure the proper function and calibration of the instrument. Instruments which fail to meet such standards will not be used for testing.

V. ENVIRONMENT:

A. Tests and interviews will be conducted in a clean, neat, environment, free of audible and visual distractions.

B. Certificates, diplomas, etc., may be in the examination room, but will be displayed in a manner that they are not in the line of sight of the examinee during the testing phase of the examination.

C. Licenses, certification, etc., shall be displayed if such display is required by law.

D. Examiners will be neat and well groomed. Dress will be consistent with the standards of the business or professional community in the area and the season of the year.

E. Uniforms will not be worn, and emblems of authority (badges, etc.) will not be openly displayed. Weapons may be worn if required, but not openly displayed.

VI. PROCEDURES:

A. Appointments:

1. Appointments will be scheduled and approved in keeping with command policies of the police department. Priorities should be established based upon the seriousness of the crimes involved, and most likely suspects should be scheduled first.

2. Documentation of details of the crime, including but not limited to the initial report of the incident, prior statements of the potential examinee, and information supporting and/or contradicting those statements, should be provided to the examiner at the time of scheduling. Known pertinent information will not be withheld from the examiner.

3. Examinations will not be scheduled until investigation has developed adequate specific information to serve as a basis for the examination, and examinations will not be scheduled in lieu of other investigative effort.

4. Not less than three (3) hours will be scheduled for any examination.

a. Recognizing the possible detrimental effect of examiner fatigue upon accuracy, not more than two (2) appointments will routinely be made for any examiner in the course of any duty day.

b. Although exceptional circumstances may dictate the conduct of a third examination during a given day, this will only be attempted with command approval, and will not be a matter of general practice.

5. Persons will not be scheduled for examination immediately following extensive or accusatory interview or interrogation, or who have indicated they are not willing to submit to the process.

6. Persons will not be scheduled for examination at a time when they:

a. are obviously fatigued or in ill health,

b. are physically injured or in pain,

c. whose judgement is obviously influenced by alcohol or drugs,

d. or who have just suffered physical or emotional trauma.

7. In the absence of physical evidence and/or witness which contradict the allegations, the suspect will be asked to submit to examination before the victim in the case. Victims will not be scheduled for examination if adequate physical evidence exists to support their allegations.

8. Persons under the age of 18 will not be scheduled for examination until formal, written, and informed consent has been obtained from the individual's parent or legal guardian.

B. Pre-Examination Activity:

Pre-examination activity is defined as the actions of the examiner in preparation of the arrival of the examinee.

1. Prior to attempting an examination, the examiner will review all existing reports and statements pertinent to the issue under investigation. Conferences with involved investigators may be held if deemed appropriate. Based on this information, coupled with the legal "elements of the crime" which must be proven or disproved, targets or issue(s) to be resolved will be selected.

2. Necessary waivers and consent forms will be prepared, specifically identifying the incident to be addressed by the examination.

3. Procedures to calibrate the instruments to be used will be followed as required.

C. Pre-Test Activity:

Pre-Test activity is defined as the contact between the examiner and the examinee prior to administering the polygraph test.

1. When brought into the room used for the examination, the examinee will first be advised of the recording and/or observation procedures in use, and will verbally consent to those procedures before proceeding.

2. The examiner will explain the purpose of the examination to the examinee, that participation in every aspect of the examination process is voluntary, and that:

a. the examinee may not be forced or in any way required to submit to the examination or make any statements or answer any questions concerning the issue under investigation;

b. the examinee may terminate the examination process at any time for any reason what so ever;

c. The examinee may consult with legal counsel at any time prior to or during the examination process;

d. (if the examinee is in custody) legal council will be provided to the examinee at no cost if the examinee cannot afford to pay the necessary fees;

e. all statements of the examinee pertinent to the issue under investigation and the results of the examination can and will be made available to persons and agencies involved in the investigation and/or adjudication of the issue to be resolved; and,

f. any other legal requirements or conditions imposed by state or federal law.

3. The examinee shall be advised of the procedures which will be followed during the examination, step by step, in chronological order.

4. The examinee will acknowledge in writing that these matters have been explained and that he/she has been so advised, and will consent to proceeding with the examination process under the described conditions.

5. Personal data to adequately identify the examinee will be obtained and recorded in writing, and will include, but not necessarily be limited to, the full name of the examinee, any alias(s) used, date and place of birth, address, and usual or present occupation.

6. The examinee will be queried concerning recent or on-going health problems and general physical condition at the time of the examination. This will include, but not necessarily be limited to,

a. the examinee's opinion concerning his/her general physical condition,

b. any on-going pain or physical discomfort,

c. any recent or on-going psychiatric care,[3]

d. and in the case of women, pregnancy.[4]

7. The examinee will be queried with regard to his/her medical history, including but not limited to:

a. recent major medical problems which required hospitalization,[5]

b. cardiovascular disease,[6]

c. neurological problems (stroke, seizures, or epilepsy),[7]

d. and past psychiatric care.[8]

8. The examinee will be queried with regard to the use of medicines, drugs, or alcohol during the period proceeding the examination.[9]

9. The examiner shall not proceed with the examination if he has reason to believe the process could be detrimental to the physical or emotional well being of the examinee without first obtaining the advice of competent medical authority.

10. The issue under investigation will be discussed in detail with the examinee. Information concerning the examinee's knowledge of the issue will be elicited, as well as the claimed source of that knowledge. Minor discrepancies between previous statements of the examinee and those made at the time of this interview will be noted. The interview will not be conducted in an accusatory manner. If major discrepancies are uncovered in the course of the interview, the examiner may attempt to resolve those discrepancies before attempting the examination.[10]

11. When the issue to be resolved is the veracity of the examinee with regard to his background and application for employment with the police department:

a. Only areas of an applicant's background which are demonstratively related to employment in law enforcement will be covered during the interview.

b. Care will be taken to insure that questions concerning the areas of sex, religion, political activity, and union or labor activity relate solely to criminal or wrongful acts, or matters in those areas which possess a potential for blackmail or pressure to the applicant.

12. When the issue to be resolved is the veracity of a police officer with regard to an internal investigation:

a. Questioning in relevant areas will be limited to the specific area(s) of inquiry which are the focus of the investigation.

b. The polygraph examination process will not be used as a "fishing expedition" to develop information in areas which are not included in the allegations under investigation.[11]

c. The examiner will strictly comply with the police department's established policy, procedures, and the provisions of state and federal law.

13. The theory of polygraph will be discussed in a manner understandable to the examinee. Questions in the mind of the examinee concerning the technique and/or process will be elicited, and will be answered in as far as possible.

D. Test Activity:

Test activity is defined as that portion of the examination process which involves the actual use of the polygraph instrument:

1. Only standardized and widely accepted techniques will be used during the course of the examination.[12] The basic structure of a technique

will not be altered. Question function and sequence will be in keeping with the technique employed.

2. The final formulation of questions to be used will be based upon the statements of the examinee during the interview.

3. No question will be asked during the test which has not been discussed and reviewed with the examinee. The examinee will agree to the exact phraseology of each question to be asked, and the working of a question will not be changed without the prior approval of the examinee before such a changed question is asked.

4. Question pacing and spacing will be in keeping with the standards of the technique being used.

5. The type of physical activity recorded will be identified for each tracing. If electronically enhanced equipment is used, the amplification or "sensitivity" being used will be recorded at the beginning of each chart.

6. The amount of pressure in pressurized systems will record at the beginning and end of the tracing.

7. Changes and adjustments to tracings during the course of the examination will be marked or recorded using a standardized procedure.

8. At the beginning (or end) of each chart, the time of the beginning (or end) will be recorded on the chart.

9. At the end of the test (or the end of each chart), the examinee will be asked to sign the chart for purposes of identification of that chart.

10. As a minimum, all charts will be marked with an identifying case or file number, the name of the examinee, the date of the examination, and the signature or initials of the examiner.

11. An opinion concerning the veracity of the examinee (truth or deception) will be based on not less than two (2) charts or repetitions of the questions used to form that opinion.[13]

12. Opinions will be based upon a standardized system of numerical evaluation or other formalized procedure validated through research.

E. Post-Test Activity:

Post-Test activity is defined as the events which follow the actual use of the polygraph instrument.

1. The examinee will be advised of the examiner's opinion resulting from the evaluation of the charts obtained.

2. If the resulting opinion is one of deception, the examinee will be given an opportunity to explain the recorded reactions indicating that

deception. Absent any feasible explanation, interview techniques will be employed in an effort to arrive at the truth of the issue addressed by the examination.[14]

VII. RECORDS AND REPORTS

A. Records of examinations, including the charts obtained, will be subjected to quality assurance procedures established by the police department and/or the responsible regional or state agency. Should those procedures not support the opinion of the testing examiner, the examinee will be given an opportunity to resubmit to the examination.

B. Information obtained from the examinee which is not directly related to the issue under investigation and which could disadvantage or creates legal liability for the examinee will not be reported without first obtaining the consent of the examinee.

C. The results of an examination and information obtained from the examinee concerning the issue under investigation will not be released to any person or agency other than those authorized by the examinee. Written reports of the examination will be annotated to that effect.

D. Records, documents, and recordings obtained during the course of an examination will be maintained for not less than 3 years (or as otherwise required by law) in a manner which protects their confidentiality.

1. Charts produced during calibration procedures may be maintained with the records of the first examination of the day.

Footnotes

[1] The criteria for "recognition" of a school is the option of the police department; it should include accreditation by a national level professional organization.

[2] Should an examiner fail to meet the experience or proficiency requirements, he may continue to conduct examinations, but only under the direct supervision of another examiner who meets such requirements.

[3] An examination should not be attempted when the examinee reports on-going psychiatric care without first obtaining the consent of the treating physician, after that physician has been advised of the stress factors involved in the examination process.

[4] In the opinion of the author, an examination should not be attempted if the examinee indicates she is pregnant, or indicates that pregnancy is a possibility. The first three months of pregnancy is the period of fetal formation, and the potential for miscarriage is at its highest. During the last three months of pregnancy, artifacts can result in polygraph charts as the result of fetal movement, or premature delivery can occur. It can be alleged that miscarriage, malformation of the fetus, or premature birth resulted from stress. The well-being and health of any examinee, including

a mother or unborn child, must be a major concern to our profession. The potential liability, both ethically and financially, is unacceptable.

[5] The trauma of recent (up to three years prior to the time of examination) major illness, injury, or surgery can have detrimental effects upon the physiology of the examinee's body. Although such trauma will not cause false negative or positive outcomes, it may precipitate inconclusive results.

[6] Since stress can be a precipitating factor in the reoccurrence of heart attack, and such a history suggests a physical weakness in this area, in light of our primary responsibility to protect the well-being of the examinee, in the opinion of the author no examination should be attempted.

[7] Stress is a major factor in the reoccurrence of these problems; as such, in the opinion of the author no examination should be attempted.

[8] If doubt exists as to whether or not the examination process could be harmful, an examination should not be attempted without first obtaining the advice of a competent medical authority.

[9] The examinee will be advised before this information is elicited that the information is required because of the potential effects on that persons physiology during the examination, and will be assured that such information will not be used to legally disadvantage the examinee.

[10] If the interview assumes an accusatory tone, it could preclude the ability to conduct an accurate examination at that time.

[11] Procedures prepared by individual agencies should closely follow the dictates of other agency policy, agreements between the agency and employee bargaining groups, and state and local law pertaining to the use of polygraph in internal investigations.

[12] Techniques which are taught by recognized polygraph schools, and preferably, techniques whose accuracy has been validated through recognized research.

[13] State law regulation may require additional charts.

[14] Care must be taken to insure that the interview process is conducted using sound interrogation techniques and in a manner which is defensible in court and observes the legal and human rights of the examinee.

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POLYGRAPH RESULTS AND BEHAVIOR ANALYSIS IN FIFTEEN CHILD ABUSE CASES

By

Robert C. Velon

This report is based on a two-year study of fourteen child sexual abuse cases in DuPage County, Illinois. DuPage County is the second largest county in Illinois with a population of approximately 800,000 residents. This study is based on all of the suspected child sexual abuse cases between June 1987 and June 1989, which were referred for polygraph examinations.

Thirteen of the polygraph examinations that were conducted were of the accused alone. In addition, there was one case in which both the victim and the suspect agreed to be polygraphed. The subjects ranged in age from 15 years of age to 66 years of age. The victims, both female and male ranged in age from 2 1/2 years through 17 years of age. There were eleven female and three male alleged victims.

Of the fourteen cases referred through the Children's Center of DuPage County, two of the cases were brought to the Center's attention by the family psychiatrist, ten cases were reported by family members, and the remaining two cases were initiated by the victim.

Three of the victims were children of the accused; three of the victims were a niece of the accused; two of the victims (the family psychiatrist referred cases) were in the care of a babysitter. One of the victims was in a state supported foster home and the remaining five victims were siblings.

The same polygraph method was used in all cases, the control question examination developed by John Reid, as well as the pre-test interview based on the behavior of the subject when answering questions. This study emphasized the behavior symptoms the subject displayed when responding to the following five questions:

1) The "You" question, the direct confrontation of the subject as to whether he committed the sexual abuse.

2) The "How is the polygraph test going to come out on you?" question.

3) The "What should happen to someone who would commit (describe act)?"

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4) The "How do you feel about taking this test?" question.

5) The "How do you think a person would feel if they committed (describe act) and were sitting right there getting ready to take this test?" question.

Each time the subject answered one of the above questions, their body language was recorded. Along with this information, as well as other information developed in the pre-test interview, control questions were formulated for use on the polygraph examination. Some of those control questions are contained at the end of this report.

CASE HISTORY AND TEST RESULT

As stated previously, three of the victims were children of the accused. In those three cases, all of the subjects projected deception throughout the pre-test through use of body language. These behaviors included: no eye-to-eye contact with the examiner, arms folded across the chest, and verbal responses which left the examiner with feelings that the subject was holding back in his answers. In all three cases the polygraph examination results also indicated that the subjects were not telling the truth. After the examination, a post-test interview was conducted which resulted in all three of the subjects confessing to the criminal sexual abuse. Of the three cases, one of the subjects plead guilty and received three years probation, one case is pending in court, and the victim in the third case became uncooperative and the case was closed.

The two cases that were referred by the family psychiatrist in which the child was in the case of a babysitter, resulted in the subjects showing no signs of deception either in the pre-test interview or the polygraph examination. During the pre-test interview the subjects were attentive, had good eye-to-eye contract, and gave straight-forward direct answers. Not only was the behavior consistent with a non-deceptive person but the polygraph examination results confirmed this. As a result of the polygraph examination, both of these cases were closed as unfounded.

In three of the cases where the victim was a niece and the accused subject was the uncle, the following occurred. One of the subjects showed no signs of deception in the pre-test interview, the subjects' answers were straight-forward and direct, he had good eye-to-eye contact, and was attentive throughout the interview. The polygraph results also indicated that he was non-deceptive. The niece in this case also wanted to be polygraphed. Her behavior through the pre-test interview was deceptive and she was caught a number of times changing her story or adding facts that were unknown before. Her polygraph results indicated that she was not telling the truth, and during the post-test interview she confessed that she had lied. Her reason for lying was to get back at her uncle who had punished her. This case was closed as unfounded.

The second uncle who was accused showed no signs of deception during the pre-test interview and polygraph examination, and as a result of the examination, this case was also closed.

In the case of the third uncle, the results of the pre-test interview and polygraph examination indicated that the subject was deceptive to two of the issues and non-deceptive to two other issues. The polygraph results were confirmed through the confession of the subject on the two deceptive issues. Since the two deceptive issues were minor, and the serious issues resulted in non-deceptive decisions, the case was closed.

In another of the cases, the victim was in the care of a state supported foster home, a home used by the State for a number of years. The subject's behavior was deceptive, and the subject's polygraph records were reported as deceptive. Through a post-test interview the subject confessed to the sexual abuse. The subject was not charged since the victim did not wish to appear in court. The State has since discontinued the use of this home as a foster care home.

In the case of a young suspect involving a sibling victim, both the pre-test interview results and the polygraph records indicated that the subject was deceptive. The Children's Center investigator requested that we not conduct a post-test interview, so there was no confirmation. Because this subject was fifteen years-of-age, the youngest subject tested, there was no juvenile court action initiated. The subject was merely sent for counseling.

The last four cases all involved siblings. In all of these cases the pre-test interview and the polygraph records were consistent with a person who was non-deceptive. Therefore, no post-test interview was conducted.

DISCUSSION

Although this study is based on 14 cases and 15 examinations, I believe that an investigator as well as a polygraph examiner can draw some very useful information from it:

1) The polygraph is a very useful tool in sexual abuse cases, and should be used whenever the need arises.

2) The polygraph can help the investigator in those cases where the facts don't support the victim's claim.

3) The post-test interview should be conducted whenever the polygraph records indicate that there is deception, unless there is a request to the contrary. I believe every effort should be made to convince the investigator that someone should conduct a post-test interview where deception is shown.

4) Behavior symptoms are a very good resource in determining deception when used in conjunction with the polygraph. In all of the confirmed cases the behavior symptoms matched the polygraph results. Every investigator should be afforded the opportunity to attend a course on interviewing and interrogation which includes an analysis of behavior symptoms.

CONTROL QUESTIONS USED IN THESE CASES

1) Between the age of 22 and 30, do you remember doing anything sexual that would be considered unusual?

2) During your (number of years) of marriage have you ever had sexual intercourse with anyone besides your wife?

3) Have you ever engaged in an unnatural sex act?

4) Have you ever had a sexual experience that you would consider abnormal or unnatural?

5) Besides having sex in public places, have you ever thought about an unnatural sex act?

6) Do you remember doing anything sexual that you would consider unusual or abnormal?

7) Have you ever masturbated in front of anyone?

8) Besides the time you told me about, have you ever engaged in an unnatural sex act?

9) Have you ever committed an unnatural sex act with a male?

10) Have you ever in your life masturbated?

11) Besides kissing a girl, have you ever done anything else sexually to a girl?

12) Besides what you told me about, have you ever masturbated in front of someone?

13) Have you ever forced someone to have sex with you?

This list is not inclusive, but I have had success using these questions in recent years. The crime at issue can be avoided by selecting control questions that do not relate to the details, or by using a Time-bar as illustrated in the first control. However, the Reid Technique does allow the use of inclusive controls.

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THE OAK RIDGE POLYGRAPH PROGRAM

1946 - 1953

By

John G. Linehan

Scripps-Howard News Service reported in January 1984 that 1,710 pounds of bomb-grade uranium, enough to make 85 nuclear bombs, vanished from Atomic Energy Commission Plant Y-12, Oak ridge, Tennessee, over the past three decades. Scripps-Howard said security was lax at the Oak Ridge plant but did not name the source of their information. Uranium inventory at government nuclear weapons plants is classified. An AEC spokesman said there are criminal provisions for prosecution in the Atomic Energy Act for unauthorized release or receipt of classified material.

It is problematic whether or not continuance of a polygraph program, discontinued in April 1953, at Oak Ridge would have prevented or reduced the inventory shrinkage. The Washington office of AEC terminated the program saying "it furnished only a marginal increase of security." Scrutiny of the polygraph program indicated continuance may have been materially helpful, not only in inventory control but as a deterrent to leakage of classified documents, data and information to unauthorized persons.

Theft and other diversion of uranium from the Y-12 plant has always been difficult to detect. The Manhattan District of Army Corps of Engineers, who operated the Oak Ridge facilities before control given to AEC, was aware of the theft potential. The Intelligence and Security Division considered physical examination of employees as they departed work but this idea was shunned as it involved strip searches, which is a subject of debate even at this date. An added security worry was keeping abreast of any attitude changes within employees or development of intent to harm national interest subsequent to background investigation of employee applicant at time of hire. All employees reportedly had full field background investigation by the government but there was no adequate means of determining continuing loyalty.

The Manhattan District's Intelligence and Security Division studied the applicability of polygraph testing and then engaged Dr. Leonarde Keeler to administer a series of polygraph examinations to Oak Ridge employees. Initial testing by Dr. Keeler was on 690 employees of the Final Product Building. Keeler was assisted by Russell Chatham, who had worked with Keeler and other polygraphists in testing German prisoners of war at Camp Wetherill, Rhode Island during World War II.

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Keeler and Chatham began testing on February 17, 1946. Examination of 690 employees resulted in several substantiated achievements. First, nine examinees admitted stealing some of the "product material." Seven told of others who had stolen product material, five said they had revealed secret and valuable information to unauthorized persons. There were 75 who admitted stealing tools and supplies, and 11 confessed to being responsible for concealing from authorities the spillage of product material. Another 22 employees admitted to use of aliases. A total of 129 of the 690 employee-examinees had adverse admissions (18.7%). One supervisor complained the polygraph program was compromising him. He explained that when employees heard they might be asked to submit to testing they returned such a large number of tools and miscellaneous stolen supplies that his pre-polygraph program inventory figures were now inadequate to account for the supply now on hand!

A second achievement was that the psychological effect of testing was so strong there was an estimated 50% to 70% reduction of "loose talk" or revealing isolated bits of secret information to unauthorized people. The third achievement was many employees who had not been tested but expected to be, and in order to prepare their consciences, brought back tools and miscellaneous purloined items.

There were only five employees who voiced objection to testing (.007%); and four withdrew objection upon learning there would be no questions about their private lives.

Subsequent to Leonarde Keeler's primary program Russell Chatham was given a contract to examine other groups of employees at Oak Ridge; and to re-examine periodically. Final Product employees were examined every three months and others semi-annually or annually. Chatham, as a prime contractor to the Atomic Energy Commission, and his staff of eleven polygraph examiners, tested not only Y-12 plant personnel but also many at K-25. Both plants were operated by Carbide & Carbon Chemical Corporation. Administrative employees of AEC and several other prime contractor employees were also tested. Selection of those tested, and frequency of periodic testing, was based upon their access to sensitive information and material.

Paul V. Trovillo was the Director of Research for Russell Chatham, Inc. Trovillo had been a forensic psychologists in the Chicago Scientific Crime Detection Laboratory from 1937 to 1941. He was a psychologist at Arizona State University in 1951 when hired by Russell Chatham, Inc. Russell Chatham, Inc.'s main offices were in the Oak Ridge AEC Administration Building where they had six examiner rooms. Up to 100 persons a day were tested for security purposes, but not all in the Administrative Building. The large scale of the operation required special application of technique and location of testing. Examinee-employees were tested as close to their work area as possible. The administrative employees were often tested in the main office while Y-12 plant employees were tested in one of two examination rooms in their immediate area and K-25 plant employees were tested in their area. Construction workers and some others were tested in two mobile laboratories. These were large panel trucks equipped with polygraph equipment and facilities for convenience in interviewing. The mobile units proved

particularly helpful when contractors had to obtain "emergency clearances" for construction workers temporarily assigned to work in restricted areas.

Methodology of the polygraph testing was complicated in that not only was the examiner attempting to determine if the employee-examinee committed an act but also whether or not the examinee was planning to commit an act. Relevant test questions were formulated to cover the commission of an act, the intention to commit an act, the purposeful revealing of secret information to unauthorized persons, the knowledge of deliberate sabotage by other employees, and any association with un-American persons or organizations. Persons being tested for initial security clearances heard such test questions as "Have you, to the best of knowledge, answered all the questions in the application and security forms completely and truthfully?" "Have you ever been arrested for a criminal offense?" "Were you ever employed by a foreign government?"

Periodic and work-termination questions probed for such acts as: "Since your last polygraph examination, have you intentionally revealed any classified information to unauthorized persons?" "Since your last polygraph examination, have you removed any uranium or classified products from the plant without authorization?" "Since your last polygraph examination, have you disposed of any uranium or classified products in an unauthorized manner?" Asking such questions on periodic re-examinations reminded the employee of the importance of security, thus acting as a psychological vaccination against undisciplined behavior.

Trovillo said the intention to commit acts is similar in psychological analysis to attitude although the latter is apt to be more diffuse and less well fastened to a specific goal or set of objectives. For example, there were these test questions: "Do you intend to do damage to this project or the United States?" "Are you in sympathy with Communism or the Communistic form of government?" Trovillo said there was justification for asking these test questions as a person's intent is a facet of that person's character; and trustworthiness is based on intent. It is of paramount importance that persons selected and retained on jobs where revealing national secrets and/or endangering sensitive products can critically harm one's country have integrity, be dependable, and of honorable intent.

Polygraph program safeguards at Oak Ridge included: 1) full background investigation and security clearances issued by the government prior to the polygraph examination, 2) minimum of two charts administered in each examination, and 3) provision for re-examination and use of supplementary questions if, for any reason, re-examination was indicated. Also, test questions were such that they could be elaborated on or re-phrased if necessary. All polygraph test charts obtained by field examiners were reviewed and analyzed by central office quality control reviewers. In addition, Russell Chatham, Inc. examiners were themselves periodically polygraphed by an outside examiner.

In April 1951 an independent survey was made at Oak Ridge of the employee-examinees attitude to polygraph testing in connection with their work. About 60 employees were randomly selected by plant supervisors

without regard to whether their known attitudes were favorable or unfavorable. Survey questions were:

1. Consider your own personal feeling about the polygraph testing program. Do you believe it contributes anything toward making you feel more confidence in the loyalty and honesty of fellow employees?

2. Having taken these tests, and knowing you will take them again sometime, and supposing you were tempted to do wrong in matters involving security: would you be afraid the polygraph might reveal your act?

3. Have you ever thought these tests may be able to reflect disloyal attitudes, intentions, or the planning by individuals to do wrong here?

Employees interviewed in the survey were said to be cooperative and frank in their replies. Only two of the 60 employees participating showed resentment toward testing as an invasion of privacy but there was no actual expression of ill-feeling. The scientists interviewed reported an unqualified endorsement of the program, and this may have then been the only work environment where outstanding scientists were periodically administered polygraph examinations. Although there had been previous surveys regarding polygraph, or lie detection, it appears this may have been the first survey of attitudes among people who experienced testing on a periodic basis. A few representative remarks received in the survey were:

A chemist and scientific information specialist employed since 1945 said: "For anyone tempted to violate a security act, the test should be a major deterrent, if he knew he would be tested again. I know of no device which could approach the polygraph as an absolute psychological measurement of integrity and intentions."

A security officer employed 7 1/2 years, who had taken nine tests wrote: "It's a supplementary aid to FBI investigations and follows up a man's attitudes after getting the job, disclosing a man's evil or good intentions and acts. A man is less likely to do wrong if he knows he has to face the test. We started using the polygraph in 1946. Since that time loose talk has fallen off, I'd say 70%. Of course, we have increased security education, but the decrease can be attributed largely to the polygraph. Though we don't use the polygraph to catch the theft of hand tools, there has been a great reduction in thefts since testing was begun and many stolen tools were returned. We get this reaction from people: They say that passing the test gives them confidence they have not done wrong."

A laboratory division superintendent who had taken five tests wrote that he had seen an instance in which a man who had removed a small amount of natural uranium initially refuse the test. When persuaded to take it he revealed the sample taken. He thought the chief value of the test was in making employees have mutual confidence and believed it necessary to recheck people at intervals.

A senior physicist with eight years experience at Oak Ridge said, "So far as I'm concerned, I like this idea of bringing accounts up-to-date by periodic testing. I have a personal satisfaction in passing each test, to

have a re-calibration so to speak. Knowledge that I would be taking the test again would surely influence me if I had any intent of doing wrong."

A physicist who was also the head of a production department had this to say: "It's my feeling a fellow would have very little chance with getting by with either dishonorable acts or intentions if he takes the polygraph test. I would certainly think the test would be a deterrent to wrong doing. I'm not upset about taking tests, and we take them and expect them as a matter of course. To my knowledge the polygraph does not lower worker morale and I know of no case of resentment in my group. It seems to me the program is definitely weakened if it is not administered to all who have equal access to classified information. If I were a Communist and could learn which groups were not taking tests, I would try to get into one of these groups."

A secretary to a superintendent who had been at Oak Ridge for four years and and taken four tests said, "I think the fact that people anticipate taking the polygraph test leads them to make confessions of irregularities. Sometimes they call our office and say they have thrown used carbon paper in the wrong wastebasket, or have recalled doing other things which they fear will show in their disfavor when they take the test. The program of periodic testing makes us more security conscious, even on little conversations."

As an illustration of cases involving AEC usage Russell Chatham related that in 1951 a polygraph examination was administered to an engineer employed by an AEC contractor in New York City. The examinee was being considered for admission as a visitor into one of the controlled areas at Oak Ridge. He had previously worked from 1943 to 1947 at the Oak Ridge Y-12 plant. During his war-time hire he only had a cursory background investigation by Army security agents. When the examinee began employment with the AEC contractor his clearance was reinstated by honoring the original clearance. In the polygraph pre-test interview the examinee said he had distant relatives, on his mother and wife's side of the family in Russia, but he did not know their names. The first in-test or instrumental phase of examination showed significant arousal to questions: "Are you in sympathy with any movement which advocates the overthrow of the American form of government?" and "Do you have any relatives or friends whom you know of who belong to any un-American organization?" In explaining test reactions, the examinee said about 1939 he had friends who were members of the Communist Party, and he named them. Subsequent tests by instrumentation on the examinee continued to show significant reactions, indicating he had not told the complete truth. He then explained the name he was currently using was not his correct legal name as on his birth certificate. He reiterated he did not have any immediate family in Russia and that he had never had contact with the distant relatives there. A personnel clearance official then interviewed the man and found him reluctant to discuss his background, so he made a request to the FBI for full background investigation. This revealed, among other things, that the man's first wife was registered to vote as a member of the Communist Party. The man was barred form Oak Ridge as a technical visitor but retained access to the limited classified information of the contractor in New York. This case illustrates how a polygraph examination disclosed information of interest to AEC and its contractor on a matter of national

security. The examinee's emotional arousal to polygraph test questions, with partial verbal admissions, were substantiated after months of full background investigation.

The Chatham firm also engaged in other polygraph-related activity during their Oak Ridge period of time. This was mainly research and assisting research of others. They cooperated with the University of Tennessee in holding a Symposium on the Polygraph on the afternoon of the Thirteenth Annual Law Institute of the University of Tennessee at Knoxville on November 14, 1952. Papers were presented by William Wicker, Dean of University of Tennessee College of Law, "The Polygraphic Truth Test and the Law of Evidence"; Edward E. Cureton, Head of the Department of Psychology, University of Tennessee, "A Consensus as to the Validity of Polygraph Procedure"; and Dr. Paul V. Trovillo, Director of Research, Russell Chatham, Inc., "Scientific Proof of Credibility." Comments were made at the Symposium by Dr. Hudson Jost, Head of Department of Psychology, University of Georgia; Dr. George W. Crane, newspaper columnist and Consulting Psychologist, Chicago, Illinois; and Russell Chatham, President of Russell Chatham, Inc., Personnel Consultants, Washington, D.C. and Oak Ridge, Tennessee.

Chatham's comments included the feeling his firm was in a position to contribute, in addition to the extensive personnel testing, a program for sponsoring research. Specifically, they were loaning polygraph instruments to interested research groups, universities, etc. He said he then had instruments at Louisiana State University, Baton Rouge; University of Alabama at Tuscaloosa; and Barnard College of Columbia University, New York City. Chatham, Inc. was acting as personnel consultants to research organizations employing the polygraph to study not only deception but also psychological stress of various sorts. They were conducting national surveys and analyzing the results for a forthcoming text as well as aiding in the financing and promoting of national surveys by others, such as the University of Tennessee survey. Chatham, Inc. was also conducting pertinent and continuous research on their own operations, all of which will be made available to others in the future.

The paper presented by Dr. Cureton at the Symposium was of interest in that it contained the report on the University of Tennessee opinion survey on the validity of polygraph. A summary of this survey is appended to this article. Dr. Cureton said the first such survey was in 1926 by Dean Charles T. McCormick of the University of North Carolina Law School who polled 88 members of the American Psychological Association but received only 38 replies. Only seven of those 38 replies indicated lack of belief in the substantial value of the tests for any purpose.

The University of Tennessee 1952 survey was suggested initially by Paul V. Trovillo. Trovillo also designed the preliminary questionnaire, was consulted in its revision and assisted in the selection of groups to whom queries were sent. Russell Chatham, Inc. bore the expense of duplication and mailing of the questionnaires.

The 1984 Scrips-Howard news item of 1,710 pounds of uranium missing from Oak Ridge in three decades since discontinuance of the polygraph program in April 1953 makes a tenable hypothesis the program furnished more than just a

marginal degree of security and was an effective tool in safeguarding classified material and information in one of our nation's highly sensitive industries.

Paul V. Trovillo died on January 22, 1978 in Ocala, Florida. At the time he was a teacher of parapsychology classes at a local community college.

Russell B. Chatham retired from the polygraph field in 1966. He died at Indianapolis, Indiana in October 1988.

Another polygraph pioneer who spent some time at Oak Ridge screening employees was Col. Ralph Waldo Pierce. Col. Pierce died February 12, 1980 at Fort Lauderdale, Florida.

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The Accuracy and Utility of Polygraph Testing. Department of Defense, Washington, D.C. 1984. Reprinted in Polygraph, 15:1, March 1984.

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Ansley, Norman. Legal Admissibility of the Polygraph. Springfield, Illinois: C C Thomas, 1975.

Conversation with recently retired Oak Ridge employee who had been given a Chatham, Inc. test in 1953 (1987).

Conversations with Russell B. Chatham.

"Department Wants FBI to Check News Service." The Indianapolis Star, January 24, 1984.

Conversations with Jack Bevan, independent polygraph examiner of Oak Ridge polygraph examiners.

"The Polygraphic Truth Test - A Symposium." Tennessee Law Review, 22, February 1953.

Unpublished manuscript of Trovillo and Chatham, circa 1954.

APPENDIX: HIGHLIGHTS OF THE POLYGRAPH SURVEY BY THE UNIVERSITY OF TENNESSEE, 1952

The original questionnaires went out to about 1700 persons presumed to have informed opinions, or experience, with polygraph instruments and their application to the detection of deception. Fifty percent of this number replied. Tabulation of responses shows that the more experience a respondent had, the higher was his opinion of validity. Opinions summarized by Dr. Cureton merit and require close analysis, but we call your especial attention to the following:

1. Only 3% of all respondents, in all experience levels, believe the polygraph to have low validity as a deception indicator.

2. Eleven percent expressed no opinion.

3. Four scales of validity were offered, high, moderate, low, and no opinion. The opinion that the technique is "highly valid" in deception-application is shared by:

63% of the psychologists
65% of the observers and experimenters
74% of the observers, experimenters and examiners
83% of the examiners
87% of non-psychologists
62% of all respondents

4. Precise conclusions as to percentages of those who rated polygraphic truth tests as of either moderate or high-validity are not determinable because some checked both moderate and high. However, we are justified in inferring that if we subtract those checking "invalid" and those checking "no opinion" from 100% the remaining figure will represent, as Dr. Cureton puts it, "lower limits rather than fair estimates," as to the percentage who rate the technique moderate to high in validity. Using this method, we find that "moderate to high" is mentioned by:

93% of the psychologists (invalid: 0%; no opinion: 7%)
97% of the non-psychologists (invalid: 1%; no opinion: 2%)
91% of the observers and experimenters (invalid: 0%; no opinion: 9%)
95% of observers, experimenters and examiners (invalid: 0%; no opinion: 5%)
98% of the examiners (invalid: 1%; no opinion: 11%)
86% of all respondents (invalid: 3%; no opinion: 11%)

That these figures are close approximates to the respondent's intent is shown by the fact that 92% of the experimenters, 97% of the observers, and 99% of the examiners rate the polygraph instrument of moderate to high validity as a device to record general emotional reactions. Dr. Cureton's research showed that psychologists tend to rate the instrument of moderate validity in recording emotional reactions (in comparison to non-psychologists), although from 93 to 9% of all groups of psychologists assign it moderate to high validity with one half of 1% to 1% rating it invalid.

THE CRIMINAL BEHAVIOR OF THE SERIAL RAPIST

By

Robert R. Hazelwood and Janet Warren

From 1984 to 1986, FBI Special Agents assigned to the National Center for the Analysis of Violent Crime (NCAVC) interviewed 41 men who were responsible for raping 837 victims. Previous issues of the FBI Law Enforcement Bulletin provided an introduction to this research [1] and the characteristics of the rapists and their victims.[2] This article, however, describes the behavior of these serial rapists during and following the commission of their sexual assaults. The information presented is applicable only to the men interviewed; it is not intended to be generalized to all men who rape.

PREMEDITATION

The majority of the sexual attacks (55-61%) committed by these men were premeditated across their first, middle, and last rapes, while fewer rapists reported their crimes as being impulsive (15-22%) or opportunistic (22-24%). Although no comparable data on serial rape are available, it is probable that the premeditation involved in these crimes is particularly characteristic of these serial rapists. It is also probable that this premeditation is reflective of their preferential interest in this type of crime and largely accounts for their ability to avoid detection.

METHODS OF APPROACH

There are three different styles of approach rapists frequently use: The "con," the "blitz," and the "surprise."[3] Each reflects a different means of selecting, approaching and subduing a chosen victim.

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The "Con" Approach

* Case Number 1

John, a man who raped more than 20 women, told the interviewers that he stopped one of his victims late at night and identified himself as a plainclothes police officer. He asked for her driver's license and registration, walked back to his car and sat there for a few moments. He then returned to the victim, advised her that her registration had expired and asked her to accompany him to his car. She did so, and upon entering the car, he handcuffed her and drove to an isolated location where he raped and sodomized the victim.

As in the above case account, the con approach involves subterfuge and is predicated on the rapist's ability to interact with women. With this technique, the rapist openly approaches the victim and requests or offers some type of assistance or direction. However, once the victim is within his control, the offender may suddenly become more aggressive.

The con approach as used in 8 (24%) of the first rapes, 12 (35%) of the middle rapes, and 14 (41%) of the last rapes. Various ploys used by the offenders included impersonating a police officer, providing transportation for a hitchhiking victim, and picking women up in singles bars. Obviously, this style of initiating contact with victims requires an ability to interact with women.

The "Blitz" Approach

* Case Number 2

Phil, a 28-year-old male, approached a woman loading groceries in her car, struck her in the face, threw her in the vehicle and raped her. On another occasion, he entered a women's restroom in a hospital, struck his victim, and raped her in a stall. Exiting the restroom with the victim in his grasp, he threatened her as though they were involved in a lover's quarrel, and thus precluded interference from concerned on-lookers who had gathered when she screamed.

In a blitz approach, the rapist uses a direct, injurious physical assault which subdues and physically injures the victim. The attacker may also use chemicals or gases but most frequently makes use of his ability to physically overpower a woman. Interestingly, despite its simplicity, this approach was used in 23% of the first rapes, 20% of the middle rapes, and 17% of the last rapes. Even though it is used less often than the con approach, the blitz approach results in more extensive physical injury and inhibits certain fantasy components of the rape that may be arousing to the rapist.

The "Surprise" Approach

* Case Number 3

Sam, a 24-year-old male, would preselect his victims through "peeping tom" activities. He would then watch the victim's residence to establish her patterns. After deciding to rape the woman, he would wait until she had gone to sleep, enter the home, and place his hand over her mouth. He would advise the victim that he did not intend to harm her if she cooperated with the assault. He raped more than 20 women before he was apprehended.

The surprise approach, which involves the assailant waiting for the victim or approaching her after she is sleeping, presupposes that the rapist has targeted or preselected his victim through unobserved contact and knowledge of when the victim would be alone. Threats and/or the presence of a weapon are often associated with this type of approach; however, there is no actual injurious force applied.

The surprise approach was used by the serial rapists in 19 (54%) of the first rapes, 16 (46%) of the middle rapes, and 16 (44%) of the last rapes (percentages vary due to the number of rapes). This represents the most frequently used means of approach and is used most often by men who lack confidence in their ability to subdue the victim through physical threats or subterfuge.

CONTROLLING THE VICTIM

How rapists maintain control over a victim is dependent upon two factors: Their motivation for the sexual attack and/or the passivity of the victim. Within this context, four control methods are frequently used in various combinations during a rape: 1) Mere physical presence; 2) verbal threats; 3) display of a weapon; and 4) the use of physical force.[4]

The men in this study predominantly used a threatening physical presence (82-92%) and/or verbal threats (65-80%) to control their victims. Substantially less often they displayed a weapon (44-49%) or physically assaulted the victim (27-32%). When a weapon was displayed it was most often a sharp instrument, such as a knife (27-42%).

One rapist explained that he chose a knife because he perceived it to be the most intimidating weapon to use against women in view of their fear of disfigurement. Firearms were used less frequently (14-20%). Surprisingly, all but a few of the rapists used binding located at the scene of the rape. One exception as an individual who brought pre-cut lengths of rope, adhesive tape and handcuffs along with him.

THE USE OF FORCE

The amount of force used during a rape provides valuable insight into the motivations of the rapist and, hence, must be analyzed by those investigating the offense or evaluating the offender.[5] The majority of these men (75-84%) used minimal or no physical force across all three rapes.[6] This degree of minimal force is defined as non-injurious force employed more to intimidate than to punish.[7]

* Case Number 4

John began raping at 24 years of age and estimated that he had illegally entered over 5,000 homes to steal female undergarments. On 18 of those occasions, he also raped. He advised that he had no desire to harm the victims. He stated, "Raping them is one thing. Beating on them is entirely something else. None of my victims were harmed and for a person to kill somebody after raping them, it just makes me mad."

Force resulting in bruises and lacerations or extensive physical trauma requiring hospitalization or resulting in death increased from 5% of the first rapes, 8% of the middle rapes, to 10% of the last rapes. Two victims (5%) were murdered during the middle rapes and an additional 2 (5%) were killed during the last rapes.

* Case Number 5

Phil, an attractive 30-year-old male, described stabbing his mother to death when she awoke as he was attempting to remove her undergarments in preparation for sexual intercourse. He had been drinking and smoking marijuana with her for a period of time prior to the attempted sexual act, and after she fell asleep, he began fantasizing about having sex with her.

Most of the rapists in this study did not increase the amount of force they used across their first, middle, and last rapes.[8] However, 10 of the rapists, termed "increasers," did use progressively greater force over successive rapes and raped twice as many women on the average (40 victims as opposed to 22 victims) in half the amount of time (i.e., raping every 19 days as opposed to 55 days). By the time of the last assault, they were inflicting moderate to fatal injuries. These factors, coupled with progressive interest in anal intercourse among the increasers, suggest that for these individuals, sexual sadism may be a motive for their assaultive behavior.

VICTIM RESISTANCE

Victim resistance may be defined as any action or inaction on the part of the victim which precludes or delays the offender's attack. These behaviors may be described as passive, verbal, or physical in nature.[9]

The rapists reported that their victims verbally resisted them in 53% of the first assaults, 54% of the middle attacks, and 43% of the last

attacks. Physical resistance occurred in only 19%, 32% and 28% of the first, middle, and last rapes respectively. The relatively low incidence of passive resistance (i.e., 28% in the first rape, and 9% of the last rape) most likely reflects the rapists' inability to discern this type of resistance.

In previous research, it was found that there was no relationship between both verbal and physical resistance and the amount of injury sustained by the victim.[10] Interestingly, however, the degree of the rapists' pleasure and the duration of the rape did increase when the victim resisted.

In this study, the offenders' most common reaction to resistance for the first, middle and last rapes was to verbally threaten the victim (50-41%). Compromise or negotiation took place in 11-12% across the rapes, and physical force was used in 22% of the first rapes, 38% of the second rapes and 18% of the third rapes. The rapists also reported 6 incidents in which they left when the victim resisted; however, it is not clear at what point in the attack the resistance occurred.

SEXUAL DYNAMICS OF THE RAPE

The sexual acts that the victim was forced to engage in remained relatively constant across all three rapes. The most common acts were vaginal intercourse (54-67%), oral sex (29-44%), kissing (8-13%), and fondling (10-18%). Anal intercourse (5-10%) and foreign object penetration (3-8%) were reported less often. In assessing changes in behavior over the first, middle, and last rapes, there appears to be a trend wherein the rapists' interest in oral sex increases while his interest in vaginal contact decreases.

The amount of pleasure that the rapist experienced during the three assaults was measured with the statement: "Think back to the penetration during the rape. Assuming '0' equals your worst sexual experience and '10' your absolutely best sexual experience, rate the amount of pleasure you experienced." The majority of rapists reported surprisingly low levels of pleasure (3.7). However, the type of contact that resulted in higher scores differed widely.[11] One rapist reported appreciation for his victims' passivity and acquiescence, while another referred to the pleasure experienced in the rape-murder of two young boys as being "off the scale."

* Case Number 6

Paul had raped adult women, adolescent and preadolescent girls and brought his criminal career to an end with the rape and murder of two 10-year-old boys. When asked to rate the sexual experiences, he advised that he would rate the adult and adolescent females as "0" and the preadolescent girls as "3." He then stated, "When you're talking about sex with 10-year-old boys, your scale doesn't go high enough."

VERBAL ACTIVITY

Across the first, middle and last rapes, the majority of serial rapists (78-85%) usually only conversed with the victims to threaten them. Much less frequently, their conversations were polite or friendly (30-34%), manipulative (23-37%), or personal (23-37%). In a minority of instances throughout the assaults, the rapist reported being inquisitive (15-20%), abusive/degrading (5-13%), or silent (8-13%). It appears that serial rapists use verbal threats to subdue the victim, and only after they believe they have gained control over the victim do they move on to various other modes of conversing or interacting.

SEXUAL DYSFUNCTION

In a study of 170 rapists, it was determined that 34% experienced some type of sexual dysfunction during the rape.[12] In fact, it has been noted that "the occurrence of offender sexual dysfunction and an investigatory understanding of dysfunction may provide valuable information about the unidentified rapist."[13]

The data on these serial rapists are strikingly similar. In the first rape, 38% of the subjects reported a sexual dysfunction, 39% in the middle rape, and 35% during the last assault. This type of information can prove helpful to the investigator in associating different offenses with a single offender, because the nature of the dysfunction and the means the offender uses to overcome it are likely to remain constant over a number of rapes.

EVADING DETECTION

Considering the rapists' aptitude for avoiding detection, it is surprising to note that very few of the serial rapists employed specific behaviors designed to preclude identification. In fact, offenders tend to rape their victims in the victim's own home, thereby contributing to their ability to avoid detection.[14]

In addition, the majority of rapists (61-68%) did not report dressing in any special way for the offenses. Surprisingly, disguises were reported in only 7-12% of the offenses, suggesting that other means of evading detection were used by these particular offenders.

ALCOHOL AND OTHER DRUGS

Alcohol is commonly associated with rape, but other drugs, to a lesser degree, are also used at the time of the rape.[15] The data on these rapists suggest a somewhat different relationship between alcohol/drugs and serial rape. Approximately one-third of the rapists were drinking alcoholic beverages at the time of the first, middle and last offenses, and 17-24% of the respondents reported using drugs. In a majority of these cases, these figures reflect the offender's typical consumption pattern and not an unusual increase in substance abuse.

POST-OFFENSE BEHAVIOR

The serial rapists were also asked about changes in their behavior following their assaults. The most frequent changes after each of the crimes included feeling remorseful and guilty (44-51%), following the case in the media (28%) and an increase in alcohol/drug consumption (20-27%). Investigators should also particularly note that 12-15% of rapists reported revisiting the crime scene and 8-13% communicated with the victim after the crime.

CONCLUSION

The research concerning serial rapists' behavior during and following the commission of the crimes has determined that:

* The majority of the rapes were premeditated

* The "con" approach was used most often in initiating contact with the victim

* A threatening presence and verbal threats were used to maintain control over the victim

* Minimal or no force was used in the majority of instances

* The victims physically, passively or verbally resisted the rapists in slightly over 50% of the offenses

* The most common offender reaction to resistance was to verbally threaten the victim

* Slightly over one-third of the offenders experienced a sexual dysfunction, and the preferred sexual acts were vaginal rape and forced fellatio

* Low levels of pleasure were reported by the rapists from the sexual acts

* The rapists tended not to be concerned with precautionary measures to protect their identities

* Approximately one-third of the rapists had consumed alcohol prior to the crime and slightly less reported using some other drug.

The most common post-offense behavior reported by the rapists were feelings of remorse and guilt, following the case in the media and an increase in alcohol and drug consumption.

These characteristics, although not generally applicable toe very rapist, can be helpful in learning more about offenders, their behaviors and the heinous crime of rape.

Footnotes

[1] Robert R. Hazelwood & Ann W. Burgess, "An Introduction to the Serial Rapist," FBI Law Enforcement Bulletin, vol. 56, No. 9, September 1987, pp. 16-24.

[2] Robert R. Hazelwood and Janet Warren, "The Serial Rapist: His Characteristics and Victims," FBI Law Enforcement Bulletin, vol. 58, Nos. 1 and 2, January and February 1989, pp. 10-17 and 11-18.

[3] Supra note 1.

[4] Supra note 1.

[5] Supra note 1.

[6] Robert R. Hazelwood, R. Reboussin & J. Warren, "Serial Rape: Correlates of Increased Aggression and the Relationship of Offender Pleasure to Victim Resistance," Journal of Interpersonal Violence, March 1989, pp. 65-78.

[7] Supra note 1.

[8] Supra note 5.

[9] Supra note 1.

[10] Supra note 5.

[11] Supra note 5.

[12] N. A. Groth & A. W. Burgess, "Sexual Dysfunction During Rape," New England Journal of Medicine, October 6, 19077, pp. 764-766.

[13] Robert R. Hazelwood, "Analyzing the Rape and Profiling the Offender," Practical Aspects of Rape Investigation: A Multidisciplinary Approach, R.R. Hazelwood & A.W. Burgess (Eds.)(New York: Elsevier Science Publishing Co., Inc., 1987), pp. 169-199.

[14] Robert R. Hazelwood & J. Warren, "The Serial Rapist: His Characteristics and Victims," Part II, FBI Law Enforcement Bulletin, February 1989, pp. 11-18.

[15] R. Rada, "Psychological Factors in Rapist Behavior," American Journal of Psychiatry, Vol. 132, pp. 444-446, 1975 and R. Rada, "Psychological Factors in Rapist Behavior," Clinical Aspects of the Rapist, R. Rada (Ed.)(New York: Grune and Stratton Publishing Co., Inc., 1978), pp. 21-85.

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WAS HE DRIVING?

By

Norman Ansley

There are a few cases involving polygraph testing where the issue was whether a defendant arrested for drunk driving was the driver of the vehicle, or merely a passenger. This is a whole either-or defense as the defendant does not deny being inebriated at the time of the accident. His defense is that he was not the driver, and when the police arrived the auto's occupants were no longer in place, and there were others present who could have been the driver.

In 1949, a jury found Everett E. Feller guilty of driving while drunk. Feller said he wasn't the driver and claimed a woman companion was driving. The woman testified that she was the driver; corroborated by her husband's testimony. The police had arrested Feller because he was sitting behind the wheel when they arrived. Despite the jury conviction, the corporation counsel accepted the defense counsel's offer to decide the case based upon the results of a polygraph test. When the examiner reported that Feller was truthful when he denied driving, the judge set aside the jury verdict. See United States v. Feller, U.S. District Court, District of Columbia, July 28, 1949.

In State v. Wardrip, 637 P.2d 219 (Ore.App. 1981) the defendant was convicted of driving while intoxicated, and he appealed. The defendant and the prosecutor had stipulated to the admissibility of polygraph test results on the issue of whether or not Wardrip was driving prior to his arrest. The polygraph test results were inconclusive, a possibility not mentioned in the stipulation. Wardrip said he didn't get a fair trial because the polygraph examiner was not allowed to testify, as agreed. The Oregon Court of Appeals agreed with the ruling of the trial judge that inconclusive results meant there was no opinion for the court to consider.

In 1984, in Corona, California, the results of a polygraph examination were sufficient to cause the District Attorney to drop charges against Donald Ray Burns, 22, who was charged with vehicular manslaughter. Burns said he wasn't the driver. The charges came after an accident in which a pickup truck sideswiped a bicycle ridden by William Henson and then swerved and hit head-on a bicycle ridden by William Joseph Hofstetter. Henson was injured and Hofstetter was killed. A witness saw Burns and Richard Scott Carrillo, 22, also of Corona, get out of the truck. The witness was sure that Burns got out of the driver's side and Carrillo got out of the passenger's side. However, the two men resembled one another in height and stature. Moreover, two other witnesses later testified that Carrillo was driving when the truck left Carrillo's home, only a mile and a half from the scene of the accident. In addition, the truck belonged to Carrillo and the keys were in his pocket when arrested later in the day. As a result of the polygraph test, the District Attorney said he would drop the charges against Burns. Deputy District Attorney Mitchell said Burns wanted to take the

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polygraph test because he wasn't driving. Mitchell said, "He took the test and passed with flying colors." The charges were dismissed at Burns' arraignment (Hodges 1984). Unlike some cases, here as in Feller, there was evidence other than the polygraph test results to refute the testimony that the subject was the driver. Such evidence is not always available in these cases.

In a more recent case, Commonwealth v. Wick, 399 Mass. 705, 506 N.E.2d 857 (1987), the defendant claimed he was an occupant but not the driver of the motor vehicle. He requested the judge to order the Commonwealth to give him a polygraph test, but the judge declined because he said the prosecutor had to agree, and he refused. The defendant was convicted and he appealed. The Supreme Judicial Court of Massachusetts, which had previously allowed admissibility of polygraph results of tests taken by defendants who testify, and admissibility of tests results taken after stipulation, found this to be a new issue. The Court agreed that the prosecution should not have a veto over the use in evidence of the results of a defendant's polygraph examination, and vacated the trial court's denial of the defendant's motions concerning polygraph examinations and remanded the case for reconsideration of those motions. The Court observed that the trial court should address their concern of "whether the judgment should be vacated in fairness to the defendant and whether the defendant has been prejudiced by the passage of time." The Court added that "if a test is authorized the judge may prefer to await the test results before deciding whether to vacate the judgment and set aside the verdict, to dismiss the complaint, or to conclude the judgment should stand."

Although the appellate court was concerned about the passage of time, it might have been more appropriate to have been concerned about the validity of a polygraph test where the subject was intoxicated at the time of the offense. The issue is state dependant memory. There is evidence that when a person commits a crime while under the influence of alcohol or some other addictive drug, after the drug wears off, the person may remember, may not remember clearly, or may not remember at all. (Barland, 1973). Research specifically on this point (Bradley and Ainsworth, 1984) disclosed that subjects who were under the influence of alcohol at the time they committed a mock crime "scored less guilty" than those who committed the mock crime while sober. Those who committed the mock crime while under the influence of alcohol were more likely to be misclassified as innocent, or produce inconclusive results, than those who were sober during the crime. These results applied to the commonly used control question test format. Bradley and Ainsworth said, "The results are potentially of great practical importance for field interrogations since suspects who committed a crime while intoxicated would have a better chance of appearing innocent than those who committed a crime while sober." Their other finding was also interesting; that "alcohol intoxication during the polygraph test does not significantly affect test results, which argues against its use as an effective countermeasures." Because of the difficulty in applying these laboratory research results to field testing where alcohol dosage, alcohol tolerance, and subject motivation are uncontrolled, we cannot assume with certainty in any specific case that the examiner's determination of non-deceptive is erroneous. Indeed, even in the Bradley and Ainsworth study some of the guilty subjects who were intoxicated at the time of the offense were detected by a

control question test format, and all of them were detected with the rarely used Guilty Knowledge Test (GKT) format. The GKT, like the Peak of Tension (POT) test, is seldom used in the field for practical reasons involving a lack of material necessary for the questions in which the key item will be known to the perpetrator or guilty person, but not known to an innocent person. In addition, only a few examiners are now formally trained in GKT use; although the well-known POT might suffice in its place. In terms of alcohol, the GKT was correct in detecting all of those who were intoxicated at the time of the offense, but misclassified two of eight guilty subjects who were sober when committing the offense but intoxicated at the time of the test. So alcohol consumption might be a problematic defense against the GKT. The research to date leaves us in the position of suspecting the validity of control question tests which find the subject not deceptive, when there is evidence of alcohol intoxication on the part of the subject at the time of the offense. However, we cannot say that such results are always wrong, or wrong in any specific case. Moreover, the practical judgment of an examiner may overcome the theoretical objection. If the suspect has detailed recall of his arrest, and recalls details of his behavior before the incident, which can be corroborated, then his ability to recall whether or not he was driving is probably not impaired. If his recall is hazy about everything before and after the arrest, or he is fabricating details, then his memory about driving may also be impaired. Such impairment might cause a false negative error, or produce an inconclusive result.

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LAW NOTES: CIVIL AND CRIMINAL CASES

By

Norman Ansley

In Underwood v. Colonial Penn Insurance Company the plaintiff sued the insurance company for not paying his claim when his house burned. The company had good reason to suspect that the plaintiff had burned his own home, and that belief was enhanced by the fact that a few hours after Underwood had alleged theft from his home to the Sheriff's office his house caught fire. In the meantime he had refused a polygraph test about the alleged theft from his house. The fact that he refused a polygraph test was admitted at trial by the judge, and it was done to impeach the plaintiff's testimony that he had cooperated in the investigation. The plaintiff appealed, claiming the testimony was inadmissible and prejudicial.

The United States Court of Appeals, Eighth Circuit, held that the trial court did not err, and that the evidence was admissible for the purpose of impeachment of Underwood's credibility. The appellate court said their decision was limited to the narrow facts of this case, but here the evidence of refusal was more probative of untruthfulness than unfairly prejudicial.

When the Eleventh Circuit Court of Appeals sent their now famous Piccinonna decision down to the trial court for further action in keeping with their decision, the trial court reinstated the conviction and sentence of Piccinonna, and testily said there were reasons why the appellate decision to admit polygraph evidence was erroneous, except for stipulated cases. The trial court said that polygraph evidence could not be used to impeach a witness because the rules of evidence refer only to testimony about the witness' "character" for truthfulness, and one polygraph test would not suffice for that purpose. As for Piccinonna, the trial court said the results of his polygraph test were inadmissible because the questions and answers were not relevant to the issues in the perjury trial.

In Freeman v. State, the prosecutor told the jury that the defendant, unlike the mother of the murdered child, didn't take a polygraph test. The judge told the jury to disregard the statement. The Alabama Court of Criminal Appeals said the trial court's prompt instruction to the jury negated the possibility of prejudice.

In State v. Higginbotham a Louisiana appellate court affirmed the decision of a trial court to exclude the results of an ex parte voice stress analysis test.

In Johnson v. United Parcel Services, Inc., an employee was dismissed from employment after taking a polygraph examination relating to thefts, and he sued in state court. The Maryland District Court held that he did not have a cause of action because Maryland legislators did not intend to create a new civil tort remedy when it passed the law limiting the use of the polygraph.

In Rhode Island, a defendant's attorney served subpoena duces tecum against a co-defendant who was to testify against his client, seeking to discover the results of his polygraph test, a test taken at the request of his attorney. The trial judge allowed part of the request, despite an attempt to quash, saying the questions and test results should be disclosed. On appeal, the Supreme Court of Rhode Island in State v. Juarez said that such a release was a breach of the attorney-client privilege. The court also noted that polygraph evidence is inadmissible in Rhode Island.

ABSTRACTS

EIGHTH CIRCUIT

Underwood v. Colonial Penn Insurance Company, 888 F.2d 588 (8th Cir. 1989)

Underwood sued Colonial Penn Insurance Company for breach of homeowners insurance policy in connection with a fire which destroyed his house. The judge entered judgment on jury verdict for the insurance company, and Underwood appealed.

Underwood claimed the trial court erred in letting the Sheriff testify that Underwood had refused to take a polygraph test in connection with alleged theft of personal property from his house. The Court said this was relevant to establish that Underwood had a motive for starting the fire which destroyed his house a few hours after the statement was made. The testimony of the Sheriff impeached the credibility of Underwood's testimony after he had claimed that at the time he was willing to cooperate with the investigation of the theft.

Actually, counsel for the insurance company brought up Underwood's refusal to be tested. In doing so he was in breach of agreement that the question would not be raised until the trial court had researched admissibility of polygraph evidence. Motion for a new trial by the plaintiff was denied.

The United States Court of Appeals, Eighth Circuit, held that the trial court enjoys wide discretion, and despite the fact that the appellate court had excluded evidence of a person's unwillingness to take a polygraph examination (Aetna Ins. Co. v. Barnett Bros., Inc., 289 F.2d 30, 8th Cir. 1961), in Underwood the reference to the polygraph refusal was not offered as substantive evidence. Here, the jury could have reasonably inferred that the allegedly stolen items were still present in the house, and that the investigation was the reason for the ensuing fire, and that fire was not coincidental. The appellate court agreed with the trial court's ruling that the evidence was admissible on cross-examination for impeachment of Underwood's credibility. Federal Rule of Evidence 613 or 801(d)(2). The appellate court held the evidence of refusal was more probative of untruthfulness than unfairly prejudicial.

The appellate court did not condone the defense counsel's action in violating the court's instruction and said he should have been more harshly dealt with by the District Court.

In sum, the court held the polygraph reference was admissible to show motive and to impeach. However, the holding was limited to the narrow factual pattern of this case. Trial judgment was affirmed.

ELEVENTH CIRCUIT

When the Eleventh Circuit Court of Appeals remanded Piccinonna to the trial court for further action, the trial court took the opportunity to criticize the appellate decision. In United States v. Piccinonna the District Court of Southern Florida, No. 85-6132-CR-JAG, 7 Feb 90 on remand said that despite the appellate ruling on polygraph evidence admissibility there were other reasons to bar polygraph evidence that were possibly insurmountable. In reinstating the conviction and sentence of Piccinonna the trial court said that the evidence could be excluded because in Piccinonna the questions and answers in the polygraph test were not relevant to the issues in his perjury trial. Excluding stipulated cases, the District Court was of the opinion that polygraph tests could not, in general, be used to impeach a witness because Fed. R. Ev. 608(a) requires that evidence for this purpose must refer to the witness' "character" for truthfulness, and it is doubtful if a single polygraph session would ever be an adequate foundation on which an expert could base an opinion on a witness' "character" for truthfulness.

For details of United States v. Piccinonna, 885 F.2d 1529 (11th Cir. 1989) see Polygraph (1989) 18(3), 125-142.

ALABAMA

Freeman v. State, 555 So.2d 196 (Ala.Cr.App. 1988)

The defendant was convicted of murder committed during rape, was sentenced to death, and he appealed.

The defendant said the comment by the prosecutor concerning his failure to take a polygraph test violated his right against self-incrimination. What the prosecutor said was "... the mother of the child, Angela Scott, was at the time that they picked Darryl Freeman up at the police department undergoing a polygraph examination, something that Darryl Freeman refused to submit to." Defense objected, Court sustained, and told the jury to disregard the fact that he refused a polygraph test as it is not required in the state, and the results not admissible if it had been taken.

The Court of Criminal Appeals of Alabama said the trial court's prompt and vigorous instruction to the jury negated the possibility of prejudice. Bracewell v. State, 407 So.2d 827 (Ala.Cr.App. 1979). The Court noted that polygraph results are not admissible under Flurry v. State, 289 So.2d 632 (Ala.Crim.App. 1973).

The conviction was affirmed.

LOUISIANA

State v. Higginbotham, 554 So.2d 1308 (La.App. 1 Cir. 1989)

The defendant was convicted of two counts of simple burglary and he appealed.

The defendant claimed error in that the trial court refused to let him admit the results of a voice stress analysis performed by a detective with the Houma Police Department. The exculpatory evidence was proffered to the court, but excluded.

The Court of Appeals of Louisiana, First Circuit, said there was no error as the results of a voice stress analysis test were not admissible. State v. Arnold, 533 So.2d 1311 (La.App. 3rd Cir.), writ denied 534 So.2d 959 (La. 1988). The conviction was affirmed.

MARYLAND

Johnson v. United Parcel Services, Inc., Civ. No. S 89-53, District Court of Maryland 12 W FC N 47 at 28.

The employee was dismissed from employment after taking a polygraph examination relating to thefts and he sued the employer.

The Maryland District Court held that he did not have a cause of action because the Maryland legislature did not intend to create a new civil tort remedy when it passed the statute limiting the use of the polygraph. Article 100, Section 95, Annotated Statutes of Maryland.

RHODE ISLAND

State v. Juarez, 570 A.2d 1118 (R.I. 1990)

Defendant's attorney served subpoena duces tecum against co-defendant, who was to testify against his client, seeking to discover material relating to the polygraph examination the co-defendant took at the direction of his attorney. The co-defendant moved to quash, but the District Court refused to grant complete relief. The matter was appealed directly to the Supreme Court of Rhode Island.

The State Supreme Court held that the District Court's order for partial disclosure revealing the questions and test results, but withholding other information, was a breach of the attorney-client privilege that did not meet the standards for allowing such disclosure as described in precedents. In addition, the Court noted that polygraph evidence would not be admissible at trial. State v. Dery, 545 A.2d 1014 (RI 1988).

WISCONSIN

State v. Pickett, 150 Wis.2d 720, 442 N.W.2d 509 (1989)

Defendant was found guilty of five counts of second degree sexual assault involving intercourse with a fourteen-year-old girl and sentenced to the maximum period of incarceration of five consecutive indeterminate terms of not to exceed ten years each, and he appealed.

Pickett claimed that the evidence of his nodding in the affirmative when asked if he committed the crime by the polygraph examiner, Lt. John Lagowski, was so close to the test that it violated the prohibition of polygraph evidence being admitted into evidence. He also claimed the questions after the test were in violation of an instruction by his attorney to the examiner. The examiner said that no such agreement existed and said that when asked if he committed the crime, the defendant nodded yes, as he did to other inculpatory questions.

The trial court held a hearing and decided that the nodding was voluntary beyond a reasonable doubt, and that the Miranda warning was properly given. The court declined to decide on whether there was an agreement to limit questions as irrelevant.

The Court of Appeals of Wisconsin noted an instruction by the trial court that the state could introduce the defendant's affirmative nod only to impeach his testimony if he took the stand, and could not use the statement in their case in chief. The appellate court agreed with this position. Pickett did take the stand and denied the offenses whereupon the examiner testified to the affirmative nods (but did not mention the polygraph test). The appellate court found "that Pickett's voluntary responses to the polygraph examiner's questions [to] be admissible for impeachment purposes."

The judgment was affirmed.

* * * * * *

Validity and Reliability of Zone Comparison Tests With Hispanic Subjects

Arellano, Luis Ramirez (1984). Research papers: The polygraph examination of Spanish speaking subjects. Unpublished manuscript, A.P.A. Archives.

Apparently, the purpose of this study was to determine the field validity of the polygraph technique in detecting deception with a Hispanic population. It appears that the research cases were selected as persons meeting the criteria arrived for scheduled cases at the Pan American Protection and Investigative Service, Inc. of Los Angeles, CA. There were forty subjects-20 men and 20 women--who met the following requirements: a) of Latin descent, b) unable to speak English, c) between 20 and 30 years old, d) in the United States less than two years, e) in the United States illegally (by their own admission), and f) suspected of one or more specific thefts by their employers. Detailed records of these cases were kept, and their polygraph charts were scored numerically by the examiner and again, blind, by another examiner.

Subjects were administered a Backster zone comparison polygraph test, with a stim test (number 1 to 10) preceding the first zone chart. Supplemental peak of tension tests for names and amounts were also used. Control questions were appropriate to a specific-issue theft test. The polygraph instrument recorded respiration (one channel), electrodermal (resistance), blood volume (cuff), and heart rate (finger monitor) activity. An arm cuff was used on the men and a wrist cuff on the women, inflated to 60 mm Hg. A standard irrelevant question which includes a name was modified because most of the subjects were using fictitious names, borrowed or fraudulent social security numbers, and other matters relating to identity to protect their illegal status. Criteria for ground truth in the deceptive cases was confession by the subject. It is not clear how the non-deceptive cases were verified. The report simply states they were later verified. All of the tests were conducted in Spanish by one examiner. The examiners were trained at the Los Angeles Institute of Polygraph, an APA accredited course.

The original examiner's decisions, based on Backster numerical chart analysis:

Male (n. 20)	DI 14	NDI 6
Female (n. 20)	DI 8	NDI 12
Totals (n. 40)	DI 22	NDI 18

All of the decisions were subsequently verified as correct. The charts were read blind by another examiner, also employing Backster numerical analysis. He did not know the topic of the tests, case facts, questions, or the original examiner's decision. The blind examiner's decisions were the same as the original examiner's decisions. Neither had inconclusives. Numerical data was not given. All of the cases called DI by the examiner made post-test admissions, and for several, this was in addition to pretest

admissions. However, one woman who made pretest admissions to theft was NDI on testing. The admissions may have influenced the original examiner's decisions, but the admissions were unknown to the examiner who read the charts blind.

The author discussed the nonverbal behavior of the innocent and guilty subjects. Pretest and post-test admissions were described in detail.

Reliability and the Effect of Increased Knowledge of Case Facts

Holmes, Warren D. (1958). Degree of objectivity in chart interpretation. In V.A. Leonard (Ed.), Academy lectures on lie detection (Vol. 2, pp. 62-70). Springfield, IL: Charles C Thomas.

One hundred polygraph cases were selected from the files of the Miami Police Department (Florida) in which the examiner's decision was substantiated by confession and confirmed by physical evidence. Then every fourth individual polygraph case was taken for blind review of the charts by six law enforcement polygraph examiners who were graduates of formal schools of instruction in polygraph technique. The cases involved felonies in which from one to three suspects were tested. In all, there were 25 suspects tested whose charts were read blind by the examiners. Cases involved nine grand larcenies, four breaking and entering, three armed robberies, three extortions, and one each of murder, fatal hit and run, forgery, perjury, and receiving stolen property.

The blind review consisted of nine steps. In the first step the examiners saw only the charts from the case file and a guide to the numbers on each chart identifying them as relevant, control or guilt complex questions. The wording of the questions was not provided, and all other information was withheld. The examiners did know that all tests were suspects in criminal cases. Based on deception, examiners made their decisions as to truth or deception, without any inconclusive calls. (However, the examiners did qualify each decision with "sure" or "not sure.")

Through the next eight steps of research the examiners were given, progressively, more information about the tests and cases; so each examiner read the 25 sets of charts nine times, each time with more information, and changing his decision if he chose to. The nine steps were:

1. Shown charts and given numbers to identify the type of question.
2. Told if the control questions were confirmed lies.
3. Shown the offense report.
4. Shown supplementary reports.
5. Shown investigator's opinions.
6. Shown witness testimony.
7. Shown notes on demeanor.
8. Shown notes on statements made by subjects.
9. Shown notes on testing demeanor.

The chart interpretation was global. The technique was relevant/irrelevant. The instruments were three-channel Keeler polygraph instruments recording cardio, respiratory and skin resistance activity.

Based on the charts alone, step one, the average accuracy was 75%, with a range of 68% to 81%. That is significantly above chance. At the ninth step, with all the information, the average accuracy of review had risen to 83%, with a range of 70% to 94%. Five of the examiners improved their accuracy as the amount of information increased (and the number of reviews increased), but one examiner got worse, going from 75% to 70% accuracy.

Reliability, Reading One Chart From a Set

Rafky, David M. & Sussman, Richard C. (1985). Polygraphic reliability and validity: Individual components and stress of issue in criminal tests. Journal of Police Science and Administration, 13(4), 283-292.

Four trained and experienced polygraph examiners numerically scored the second chart of sixty sets of confirmed polygraph charts, 30 truthful, 30 deceptive. During the first scoring session they saw three copies of the original second chart for each case: the first copy showing only the respiratory tracing, the second showing only the electrodermal tracing, and the third showing only the cardiosphygmograph tracing. Six weeks later they rated the same sixty charts, but this time they saw all three tracings but scored the charts by channel. Finally, the four were asked to assess the overall stress in the chart, with scores of 1, 2, and 3 for low stress, and 4, 5, and 6 for high stress. These stress scores were compared with the type of crime, supposing that the charts from the 30 felony crimes (murder, aggravated battery, and grand theft) would show higher stress than the charts from the 30 misdemeanor cases (petty theft and simple assault).

The authors sent a survey to 200 members of the American Polygraph Association asking about their preference for one physiological channel over the others.

There was no relationship between the amount of stress seen in the chart and the type of crime.

When the examiners scored just one channel at a time from the second chart of the 60 sets, their average correct judgments of these confirmed cases, by physiological channel, was as follows:

Correct Decisions from 60 Sets

Respiration	Cardio	Electrodermal
n. 47 (78.3%)	n. 51 (85.0%)	n. 48 (80.0%)

When these were separated by truthful and deceptive, the scoring of the single channels by four examiners on the second chart of the 30 sets of each were better as follows:

Correct Decisions from 60 Sets, Inconclusives Excluded

	Respiration	Cardio	Electrodermal
n. 120, truthful	89 of 96 (93%)	101 of 102 (99%)	102 of 102 (100%)
n. 120, deceptive	99 of 103 (96%)	104 of 105 (99%)	91 of 100 (91%)

When the four examiners scored the same charts, six weeks later, where they could see all the channels on the second chart of each of the sixty sets, while scoring the charts one channel at a time, the results were a little better than they did when they could only see one channel. They were, this time, allowed to score all the chart components together, and the combined scores were better than the separate scores where they could see the other channels.

Correct Decisions from 60 Sets

Respiration	Cardio	Electrodermal	All Components
n. 48 (79.2%)	n. 52 (87.5%)	n. 49 (81.7%)	n. 55 (91.3%)

Correct Decisions from 60 Sets, Inconclusives Excluded

	Respiration	Cardio	Electrodermal	All Components
n. 120 truthful	90 of 99 (91%)	102 of 105 (97%)	100 of 101 (99%)	110 of 116 (95%)
n. 120 deceptive	100 of 104 (96%)	108 of 110 (98%)	96 of 101 (95%)	109 of 113 (96%)

Respiration, Significant Aspects of the Pattern

Nakayama, Makoto & Tamamura, Takehiko (1989, Oct.) Changes of respiration patterns to the critical question in guilty knowledge technique. Abstract in Psychophysiology (Supplement), 26(4A), 45. Paper presented at the annual meeting of the Society of Psychophysiological Research, New Orleans, LA.

The respiratory patterns of 20 guilty knowledge technique polygraph examinations were analyzed by a computer processing technique with digitization of the waveform. Subjects were 17 men and 3 women whose deception during these criminal cases were confirmed by subsequent confession. The

object was to determine which aspects of the waveform were of diagnostic value.

Respiration amplitude, compared to the pre-stimulus level was suppressed. Expiratory time increased significantly following the critical question, but changes in inspiration time were not significant. The rate of curvilinear length decreased significantly following the critical question, compared to the length following non-critical questions. The rate of curvilinear length following the question after the critical question was significantly enhanced, and this was considered by the authors as rebound to the suppression which followed deception.

A statistical analysis was not included in the abstract.

Scoring Electrodermal Records

Robert J. Barry (1990). Scoring criteria for response latency and habituation in electrodermal research: A study in the context of the orienting response. Psychophysiology, 27(1), 94-100.

In scoring electrodermal records there is the question of where you say a reaction begins that is a response to the question (stimulus) as opposed to the possibility that the reaction is nonspecific or spontaneous. The general rule in laboratories is that any reaction beginning from one second to five seconds after the onset of the stimulus is considered specific. Polygraph schools have taught varying rules. More conservative scientists have suggested that one to three seconds was probably adequate for most purposes. This research was to investigate the impact of narrowing the response latency window upon habituation of the electrodermal orienting response, by halving a four-second window.

The results indicated that there is value in moving to a narrower window to define electrodermal response in studies of the orienting response, as it reduces the chance of nonspecific responses being labeled as reactions to the stimuli. They found this true when they halved a four-second window to a two-second window. The risk of mislabeling nonspecific reactions was also halved. The author was of the opinion that when the stimulus is stronger and arousal is heightened as in polygraph testing, then even more nonspecific activity may be expected and the narrower range is of even greater importance. There is however the danger of increasing no-response scoring by excluding some reactions that may be related to the stimulus. The author suggested that further research compare the effects of two-second windows with three-second windows.

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Japanese Use of the Polygraph

Takehiko Yamamura & Yo Miyata (1990). Development of the polygraph technique in Japan for detection of deception. Forensic Science International, 44, 257-271.

Polygraph examinations in Japan have been performed for criminal cases under strict administrative controls of law enforcement agencies since 1956. It has not been used for civil cases or employment screening. In addition to the National Police Agency, tests are given in the Self Defense Forces and the Ministry of Postal Services.

The number of examinees tested at the police laboratories for the past 20 years has been more than 5,000 per year. Nearly 40% were found deceptive, and for most a conviction was obtained. There were 55% who were found non-deceptive, leading to exoneration; with the remaining 5% being inconclusive. The Self Defense Forces and Ministry of Postal Services conduct less than 500 tests each year, and those are internal cases such as theft by an employee.

Qualifications to be trained as an examiner are a bachelor's degree in a field related to psychology or psychophysiology and assignment to a local forensic science laboratory at the police headquarters in a district. Basic training is six weeks at the National Academy of Forensic Science. The curriculum includes lectures on methodology, psychophysiology, psychology, and practice. There is a one-year probationary status before final certification. They then must attend a workshop for further study, and last they must engage in basic and applied research on the polygraph at the university laboratory for at least one-half year. There are 95 authorized polygraph examiners in Japan of which 54 are full-time and 40 are also document examiners.

Instruments record respiration, skin conductance or skin resistance, and cardiosphygmograph or plethysmograph (finger pulse volume) activity. Techniques include concealed information technique with a guilty information paradigm (peak of tension or guilty knowledge test) and a control question technique, developed from the Backster Zone Comparison Test. Often both techniques are used to test one person.

The Psychology Section at the National Institute of Police Science has studied validity by following up on the disposition on field cases, by comparing the original examiner's decision to cases confirmed by confessions, and by blind analysis of charts from real cases by experienced examiners to study the correlations of agreement.

Polygraph results have been admitted as evidence in criminal trials in Japan since a decision of their Supreme Court in 1968. There are five requirements for admissibility: 1) use of a standard instrument; 2) employment of a rational test technique; 3) conducted by a qualified examiner; 4) subject was in suitable physical and mental condition; and 5) a well-described documentation of the result.

ZONE COMPARISON IS THE PROPER NAME

By

Norman Ansley

The Backster Zone Comparison technique never contained the work "of" between zone and comparison. It makes no sense. Nonetheless, the Army at some point in time change the name to "Zone of Comparison," and worse, shortened that to "ZOC."

Indeed, the three major techniques adopted by the Army were taken without ever giving the developers the credit they deserved by attaching their names. When the Army course opened in 1951 it taught the Keeler techniques, but the primary one was called simply the General Question Test. When the Army later adopted the Reid format, they again deprived the author of his due, and called it only the Modified General Question Test. In 1961 the Army studied the Backster Zone Comparison technique, adopted it, and followed the same arrogant policy of leaving the author's name out of the title. Then, at some unknown time, someone put "of" between Zone and Comparison. There was no justification for making this change. Hundreds of graduates of the Army School were solemnly taught that "Zone of Comparison" was the correct title, and that the creator of the technique was wrong. I have always thought that was outrageous, as was the failure to credit John Reid and Leonarde Keeler.

On the point of zone comparison, here is what Cleve Backster writes:

> My definition of a "zone" has always been close to the following: "A twenty to thirty-five seconds block of polygraph chart time initiated by a question having a unique psychological focusing appeal to a predictable group of examinees."
>
> There are only three such predictable groups, the two more prevalent being the "guilty" (as later verified), represented by the red color code and the "innocent" (as later verified), represented by the green color code. When I speak of "zone comparison", I primarily refer to the presence or lack of reactions in the zone initiated by the relevant question (red zone) compared to the presence or lack of reactions in the zone initiated by the control question (green zone). The third group, represented by the black zone, is composed of an ever diminishing group of individuals mistrusting the examiner in regard to the asking of unreviewed questions. This group is represented by the black color code and its block of time is initiated by "symptomatic" questions designed to detect the symptom of such mistrust, without delving into the "outside issue" worrying the Subject. (personal letter 24 Feb 90).

Mr. Backster speaks of his frustration at the Army as follows:

> After more than twenty years of my ongoing objections to the renaming of my technique (ZOC), the first firm indication of some success was contained in the Department of Defense 1984 report, "The Accuracy and Utility of Polygraph Testing" (p. 31).

The reference to the DoD report is correct, except that the Army was not responsible for the correct use of the zone comparison title. That publication was written at the National Security Agency, where they know better.

To set the record straight, the zone comparison technique was originated by Cleve Backster in 1960. His use of a seven-position chart analysis scale started during 1961, and the numbers were assigned to each of the seven symbols during 1962. The first widely circulated publication relating to the "seven position" scale with both symbols and numerical values, was in the form of the "Standardized Polygraph Notepack and Technique Guide." This was first circulated in 1963, although it should be noted that there was a spirit duplication multi-colored version in use in 1962. A copy of that spirit duplicated version and the printed, color coded version are now in the APA Archives, thanks to a donation of historical documents by Cleve Backster.

So far as I can determine, Cleve Backster is also the first person to publish a standard method for the numerical analysis of polygraph charts. Variations on his rules have been developed by the Army School and later by researchers at the University of Utah. Over the years, both Backster and the Army have changed the technique, and additional changes have been made by James A. Matte, David C. Raskin, and the Canadian Police College.

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By

Janet Kay Pumphrey

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The first source is ACADEMIC INDEX (CD-ROM), 1987 through April 1990.

Lie Detectors and Detection - Analysis

Workplace testing: Who's testing whom? (Drug testing, polygraph testing, and HIV virus testing). By Eric Rolfe Greenberg. il. Personnel, 66(May 1989): 39+ (A survey of 1,005 companies by the American Management Association).

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Honesty tests for new employees. By William E. Sheeline. il. Fortune, 118(December 19, 1988): 9+

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Conferees vote polygraph ban for private-sector employees. By Macon Morehouse. Congressional Quarterly Weekly Report, 46(May 21, 1988): 1386+

Workplace testing: Results of a new AMA survey. (American Management Association 1987 survey on drug, polygraph, competency, and AIDS virus testing of employees). By Eric Rolfe Greenberg, il. Personnel, 65(April 1988): 36+ NOTE: The 1988 survey is listed under Lie Detectors and Detection - Analysis. This shows the researcher that even within one computer run, articles that are comparable are not listed under the same headings.

Bearers of false witness (lie-detectors). The Economist (Great Britain). 306(March 12, 1988): 31+

Lie Detectors and Detection - Law and Legislation

Honestly, can we trust you? Barred from using polygraphs, employers seek an integrity test. By Christine Gorman. il. Time, 133(January 23, 1989): 44+

Advise on substitutes for lie-detector testing. Nation's Business, 76 (November 1988): 12+

Ask me no questions ... (Senate passes bill to control use of polygraphs). Time, 131(June 20, 1988): 31+

Privacy: Companies are delving further into employees' private lives - and workers are fighting harder for the right to be let alone. (Includes articles on experiences of several employees and implications of firing employees). By John Hoerr, Katherine M. Hafner, Gail DeGeorge, Ann R. Field, Laura Zinn and Susan B. Garland. il. Business Week, March 28, 1988, 61+

Developments in job-related polygraph examinations. By Betty Southard Murphy, Wayne E. Barlow and D. Diane Hatch. Personnel Journal, 67(January 1988): 26+

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Employee medical and honesty testing. (Fifth in a series on the right to privacy at the workplace). By Anne E. Libbin, Susan R. Mendelsohn and Dennis P. Duffy. Personnel, 65(November 1988): 38+

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Information vs. privacy: the polygraph debate. By Elaine Hobbs Fry and Nicholas Eugene Fry. il. Personnel, 65(February 1988): 57+ Note: Includes survey material of 400 major U.S. Corporations.

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Psychopathy, threat, and polygraph test accuracy. By Christopher J. Patrick and William G. Iacono. Journal of Applied Psychology, 74(April 1989): 347+

Detection of guilty knowledge: A comment on Forman and McCauley. By David T. Lykken. Journal of Applied Psychology, 73(may 1988): 303+

Human versus computerized evaluations of polygraph data in a laboratory setting. By John C. Kircher and David C. Raskin. il. Journal of Applied Psychology, 73(May 1988): 291+

Detecting infrequent deception. By Kevin R. Murphy. il. Journal of Applied Psychology, 72(November 1987): 611+

Lie Detectors and Detection - Technique

The ambivalent polygraph. By William R. Johnson. il. ETC.: A Review of General Semantics. 44(Winter 1987): 354+

The second database used in this "Reading Corner" is the GOVERNMENT PUBLICATIONS INDEX. You will note that most of these articles, hearings, or reports are available from the U.S. Government Printing Office. You may find them available at regional government depository libraries. Check with your State Law Library to see if it is a designated depository library of governmental documents. Even though some of these items date back to the late 1970's and early 1980's, it is important to note that they are still available and the general public is using them for research and reading materials on lie detectors and detection.

Polygraphs for counterintelligence purposes in the Department of Defense: Hearing before the Committee on Armed Services, United States Senate, 98th Congress, 2nd Session, March 7, 1984. Washington, D.C.: U.S. Government Printing Office, 1984. (Includes a two-page bibliography.)

Statement of Richard K. Willard, Deputy Assistant Attorney General, U.S. Department of Justice, before the Legislation and National Security Subcommittee of the Committee on Government Operations, U.S. House of Representatives, concerning presidential directive on safeguarding national security information and polygraph examinations of federal employees. Washington, D.C.: Department of Justice, 1983. (Date of hearing: October 19, 1983.)

Use of polygraph tests by the U.S. Department of Defense: hearing before the Subcommittee on Civil and Constitutional Rights of the Committee on the Judiciary, House of Representatives, 97th Congress, 2nd Session on use of polygraph tests by the U.S. Department of Defense, December 9, 1982. Washington, D.C.: U.S. Government Printing Office, 1984.

Validity and reliability of detection of deception by David C. Raskin,

Gordon H. Barland, and John A. Podlesney. Washington, D.C.: Department of Justice, Law Enforcement Assistance Administration, National Institute of Law Enforcement and Criminal Justice. U.S. Government Printing Office, 1978. (Grant No. 75-NI-99-0001.)

The Administration's initiatives to expand polygraph use and impose lifelong censorship on thousands of government employees; 25th report by the Committee on Government Operations together with additional and dissenting views. Washington, D.C.: U.S. Government Printing Office, 1983.

Congress and the administration's secrecy pledges: hearing before a subcommittee of the Committee on Government Operations, House of Representatives, 100th Congress, 2nd Session, August 10, 1988. Washington, D.C.: U.S. Government Printing Office, 1988.

Employee Polygraph Protection Act: Report together with minority, dissenting, additional, supplemental dissenting and additional dissenting views (to accompany H.R. 1212)(including cost estimate of the Congressional Budget Review). Washington, D.C.: U.S. Government Printing Office, 1987.

Employee Polygraph Protection Act of 1985: Report together with dissenting and supplemental views (to accompany H.R. 1524 which on March 7, 1985 was referred to the Committee on Education and Labor)(including cost estimate of the Congressional Budget Office). Washington, D.C.: U.S. Government Printing Office, 1985.

Employee Polygraph Protection Act of 1988. Washington, D.C.: U.S. Government Printing Office, 1988. (Caption title: An Act to Prevent the Denial of Employment Opportunities by Prohibiting the Use of Lie Detectors by Employers Involved In or Affecting Interstate Commerce.)

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Federal polygraph limitation and anti-censorship act: Hearing before the Subcommittee on Civil and Constitutional Rights of the Committee on the Judiciary, House of Representatives, 98th Congress, 2nd Session, on H.R. 4681. (September 12, 1984). Washington, D.C.: U.S. Government Printing Office, 1984.

Federal polygraph limitation and anti-censorship act of 1984: Report (to accompany H.R. 4681)(including cost estimate of the Congressional Budget Office). Washington, D.C.: U.S. Government Printing Office, 1984.

Hearing on H.R. 4681, relating to the administration of polygraph examinations and prepublication review requirements by federal agencies: Before the Investigations Subcommittee of the Committee on Armed Services, House of Representatives, 98th Congress, 2nd Session, September 6, 1984. Washington, D.C.: U.S. Government Printing Office, 1985.

National Security Decision Directive 84: Hearing before the Committee on Governmental Affairs, United States Senate, 98th Congress, 1st Session,

September 13, 1983. Washington, D.C.: U.S. Government Printing Office, 1984.

Polygraph Protection Act of 1985: Hearing before the Committee on Labor and Human Resources, United States Senate, 99th Congress, 2nd Session on S. 1815, April 23, 1986. Washington, D.C.: U.S. Government Printing Office, 1986.

The Polygraph Protection Act of 1985: Report together with additional views (to accompany S. 1815). Washington, D.C.: U.S. Government Printing Office, 1986.

Polygraph Protection Act of 1987: Report together with minority views (to accompany S. 1904). Washington, D.C.: U.S. Government Printing Office, 1988.

Polygraph testing in the private work force: Hearings before the Subcommittee on Employment Opportunities of the Committee on Education and Labor, House of Representatives, 100th Congress, 1st Session, Hearings held in Washington, D.C. on March 5 and April 30, 1987. Washington, D.C.: U.S. Government Printing Office, 1987.

Polygraphs for counterintelligence purposes in the Department of Defense: Hearing before the Committee on Armed Services, United States Senate, 98th Congress, 2nd Session, March 7, 1984. Washington, D.C.: U.S. Government Printing Office, 1984.

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Review of the President's National Security Decision Directive 84 and the Proposed Department of Defense Directive on Polygraph Use: Hearing before a Subcommittee of the Committee on Government Operations. House of Representatives, 98th Congress, 1st Session, October 19, 1983. Washington, D.C.: U.S. Government Printing Office, 1984.

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