

NOTICE:

The copyright law of the United States (Title 17, United States Code) governs the making of reproductions of copyrighted material. One specified condition is that the reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses a reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

RESTRICTIONS:

This student work may be read, quoted from, cited, for purposes of research. It may not be published in full except by permission of the author. Per request from author do not reproduce this work in print.


Does the Position of the Known Lie Test
Influence Polygraph Results?

Maria A. Taylor

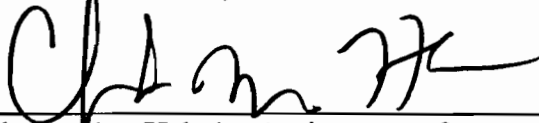
Presented to the faculty of Lycoming College
to fulfill the requirements for Departmental Honors in Psychology

February, 2000

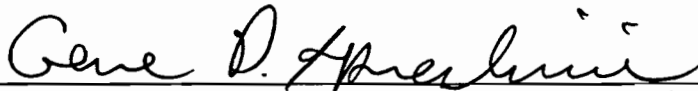
Approved by:



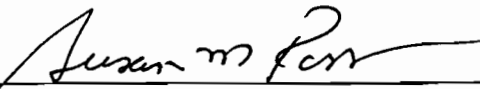
Dr. Howard Berthold, Associate Professor of Psychology



Dr. Christopher Hakala, Assistant Professor of Psychology



Dr. Gene Sprechini, Associate Professor of Mathematics



Dr. Susan Ross, Assistant Professor of Sociology

Running Head: POSITION OF KNOWN LIE TEST

Does the Position of the Known Lie Test
Influence Polygraph Results?

Maria A. Taylor

Lycoming College

Abstract

Polygraph examiners and researchers continue to try to improve polygraph testing in order to increase reliability and validity. During polygraph tests, examinees are asked a set of questions three separate times while their physiological responses are recorded on three charts. The present study tested whether position of Known Lie Test (KLT) affects the accuracy of polygraph test outcomes. A KLT is a procedure which demonstrates the validity of the test to the examinee. An analysis of 653 test found no significant difference between outcomes when placing the KLT before, rather than after, the first chart.

Does Position of Known Lie Test Influence Polygraph Results?

Polygraph testing has received a great deal of media attention due to its controversial use not only in the criminal justice system but also in screening job applicants. Although the Employee Polygraph Protection Act (EPPA) curbed its use for pre-employment interviews in the private sector in 1988 (Ash, Slora, & Britton, 1990), government agencies, including police departments, still test job candidates using the polygraph (Horvath, 1993). There is still considerable doubt about its reliability for aiding in the criminal justice process. Less than half of the states allow its use in court proceedings.

There is a wealth of research regarding polygraph testing (66 studies were read in preparation for this experiment). Research has been completed concerning the most effective type of test format (Bradley, MacLaren, & Black, 1996; Patrick, & Iacono, 1991), physiological responses (Bradley, & Janisse, 1981; Honts, Raskin, & Kircher, 1994), countermeasures which are ways to “beat” the test (Capps, & Ansley, 1992), examiner experience (Elaad, & Kleiner, 1990), and known lie or stimulation tests (Barland, 1978b; Abrams, 1978). In addition, there is research about its use for testing sex offenders and victims (Merrill, 1995; Jayne, 1995), for pre-employment (Ash, Slora, & Britton, 1990; Horvath, 1993), and for testing psychopaths (Krsrich, 1997). The reliability and validity of polygraph tests has been the topic of numerous studies (Olsen, Harris, Capps, & Ansley, 1997; Ansley, 1990; American Polygraph Association, 1997). The lack of a strong, consistent empirical base reinforces the need to evaluate past research and continue study to improve the test.

During a polygraph test, fear of detection arouses the autonomic nervous system and changes physiological responses (respiratory, cardiovascular, and Galvanic skin responses).

These three types of responses are picked up by transducers which convey them to the polygraph instrument where they are recorded and charted separately on paper for evaluation (Fingerhut, 1978). Appendix A is an example of a polygraph chart in which line A is the respiratory response, line B is the Galvanic skin response, and line C is the cardiovascular response.

All the records in this study were completed using two types of question tests: the modified zone comparison (MZC) and the modified general question test (MGQT). With each type, there are usually three charts produced by repeating a set of questions three times. When the MZC is used (Appendix B), there are three relevant questions (5, 7, 10) which are formulated from the facts of the case. There is a sacrifice relevant question that is the first of the questions about the specific type of case. It is the most general question of the series of questions. The examinee is asked if he or she intends to answer each question about the case truthfully. The questions that follow incorporate more details about the case. There are also three comparison questions (4, 6, 9) that deal less with the details from the case and more with the examinee's past with regards to the type of crime in question. There is also a question that is irrelevant to the case, which normally deals with the day, month, or year. This question is different for each of the three charts. The rest of the questions remain the same and are asked in the same order.

The format of the questions for the MGQT (Appendix C) differs slightly from the MZC. There are four relevant questions (3, 5, 8, 9), only two comparison questions (6, 10), and four irrelevant questions (1, 2, 4, 7). The questions as well as their order remain the same for both chart I and chart II. For chart III, the questions are asked in a different order (2, 1, 5, 6, 4, 3, 10, 9, 6, 8, 10).

Each of the relevant questions on both the MZC and the MGQT is given a score (Appendix D), based on a 3-point scale, for each of the three physiological responses. When a response is evaluated as deception indicated (DI), a score of -1 is given. If the response is evaluated as no deception indicated (NDI), it receives a score of $+1$. If the examiner was unable to draw conclusions from the response, it is given a 0 , which is inconclusive. For example, on chart I of Appendix D, the score for relevant question 3 is -1 for respiration, 0 for Galvanic skin response, and -1 for the cardiovascular response. These give a subtotal of -2 for question 3 of chart I. The same procedure is used for the remaining three relevant questions. The same procedure is followed to score charts II and III. The three subtotals (one for each chart) for each question are summed to get the spot total for each of the questions. In the example in Appendix D, the subtotals for question 3, -2 , 1 , and -3 , equal -4 , which is entered as the spot total. If an examinee receives a -3 or above on any spot total, the outcome of the test is deception indicated.

Because of the controversy about the validity and reliability of the polygraph, examiners and researchers have been trying to improve the testing process. The rationale for the Known Lie Test (KLT), which has also been called a stimulation test, a numbers test, or a demonstration, is that it gives the examiner an example of the physiological pattern for a lie, therefore making it easier to differentiate deception from other emotional reactions. The KLT is also useful in acquainting the examinee with the polygraph and demonstrating its accuracy (Barland, 1978a). After the KLT, deceptive people doubt their chances of beating the test (Barland, 1978a); therefore, they have a greater anxiety level for the relevant questions (Widup & Barland, 1996). According to Widup and Barland (1996), the KLT reduces the difference between relevant and comparison questions by reassuring truthful examinees that the polygraph is accurate thereby reducing their anxiety for relevant

questions (Barland, 1978a) and increasing it for comparison questions (Widup & Barland, 1996). An increased clarity of the responses will increase the detectability of deception (Abrams, 1978), thereby reducing the number of inconclusive outcomes and decreasing error (Senese, 1976).

The KLT is often conducted using numbers. The examinee chooses a number and writes that number, usually a 4, 5, or 6, very largely in the center of a piece of paper and circles it. The examiner then asks the examinee a series of questions, instructing him or her to purposely lie when asked about the number that was written. For example, suppose the examinee wrote the number 4. In the question series when the examiner asks if he or she wrote the number 4, the examinee should answer "NO". Upon completion of the KLT, the chart is shown to the examinee, and the polygraph examiner explains how easily truthfulness and deception are identified (Hickman, 1978). According to Barland (1978b), even if the examiner does not identify the number chosen by the examinee, the test can still have its desired results. The examinee does not know that the examiner did not get the desired results because the examiner still explains the tests' effectiveness.

Presently, examiners use their own discretion when using the KLT. Some examiners use the KLT on every polygraph test while others simply use it with criminal cases (Barland, 1978a) or not at all. The KLT can be completed before (position 1) the first chart of a polygraph test or between (position 2) the first and second charts (Barland, 1978b); however, some examiners only use the KLT when the first chart indicates that the examination might have an inconclusive outcome (Barland, 1978a).

One should keep in mind that all three charts in a polygraph test are weighted equally when deciding the outcome of a test. If the KLT is completed between the first and second chart, the first chart would not show the effects of the KLT; therefore, the data

might be diluted because the examinee may not believe in the accuracy of the test. When the KLT is completed before the first chart of the test, the examinee can witness the accuracy of the test and respond accordingly. In addition, if the KLT is between the first and second charts, the first chart must be used to adjust the polygraph instrument, which also leads to a less accurate chart. However, if the KLT is conducted before the first chart, the instruments can be adjusted during the KLT without sacrificing the data of the first chart. It is possible that it is easier for the examiner to score charts II and III if the KLT is completed in position 2 because he or she can refer to chart I to see the differences in physiological responses. When the KLT is between the first and second charts, it acts as an interruption of the test because it seems unrelated to the issues of interest to the test. If the KLT is conducted before the first chart, it acquaints the examinee with the test without interrupting the flow of the test.

There are two research issues involving the KLT. One issue is whether or not the KLT improves the accuracy of charts. The other issue concerns how the location of the KLT affects the accuracy of the conclusions. Previous research dealing with the KLT has presented very mixed results. Some studies report that the KLT decreases the accuracy of charts (Ellson, Davis, Saltman, & Burke, 1952 as cited in Widup & Barland, 1996). However, Senese (1976) concluded that inconclusive rates are lower on charts following the KLT while accuracy is higher. It is possible that the KLT aids in the clarification of physiological responses which would allow for easier detection of deception or truthfulness.

The most definitive study on the position of the KLT was done by Widup and Barland (1996) in a military setting. They note that the Department of Defense Polygraph Institute (DoDPI) teaches that when the KLT is used it should be placed between the first

and second chart. Widup and Barland (1996) found no results to refute this strategy; the location of the KLT does not seem to affect the inconclusive rate or the outcome of polygraph tests. The purpose of the present study was to further test the position issue utilizing records completed by a polygraph examiner from the Pennsylvania State Police. It was predicted that the results of polygraph charts would be more accurate when the KLT was located before the first chart.

Method

The polygraph tests that were used for the present study were conducted by Trooper Ken Davis, a polygraph examiner for the Pennsylvania State Police. Most tests were completed on one of three types of polygraph instruments. Between 11-14-94 and 5-12-95, the examiner used a four pen ink Stolting Ultrascript 80547-3137. A four pen thermal Lafayette 761-64GA was used for tests between 5-15-95 and 10-31-97. Since 11-10-97, a computerized Lafayette LX3000 has been used to test the examinees.

The records were divided into two groups. Position 2 included 505 tests completed between 11-14-94 and 9-28-98 in which the KLT was completed between the first and second charts. Position 1 consisted of 139 tests completed between 10-1-98 and 11-10-99 in which the KLT was conducted before the first polygraph chart. For the nine remaining tests, which were completed between 11-17-99 and 12-8-99, the examiner randomly chose whether to complete the KLT in position 1 or 2 before beginning each test. Each of these nine tests were then assigned to position 1 or 2 accordingly.

Characteristics of the examinees are shown in Tables 1, 2, and 3. Information such as age, gender, drug and alcohol use, and educational background was collected from pretest interviews. This demographic information was combined with information about the cases such as the type of case, the position of the KLT, the outcome, and the role of the

examinee (suspect, witness, victim, or accused). The types of cases as a function of the examinee and outcomes of the tests are shown in Tables 4 and 5.

Results

Table 6 shows the outcomes of the polygraph examinations between the two positions (1 and 2). No significant difference was found as a function of the position of the KLT ($\chi^2(2, N=653)=1.274, p>.05$). Position of the KLT did not seem to affect the outcome of polygraph tests. Table 7 shows the difference between the proportions of decisions (DI and NDI combined) and inconclusives as a function of the position of the KLT. The result was also not statistically significant ($\chi^2(2, N=653)=0.274, p>.05$).

Table 8 divides both positions 1 and 2 into 3 chronologically ordered subperiods in order to determine whether experience of the examiner changed the pattern of decisions and inconclusives over time. The 505 records in position 2 were divided into 168 tests (2a) between 11-14-94 and 3-25-96, 168 tests (2b) between 3-25-96 and 6-2-97, and 169 tests (2c) between 6-9-97 and 9-28-98. There were 25 inconclusive outcomes (15%) during the first subperiod (2a), 9 (5%) during the second (2b), and 4 (4%) during the third (2c). The reduction in the proportion of inconclusive results was statistically significant ($\chi^2(2, N=505)=20.660, p<.05$). Between 10-1-98 and 11-10-99, the KLT was completed in position 1. When position 1 was chronologically divided into 3 subperiods, the reduction of the proportion of inconclusive results was less dramatic and did not reach statistical significance at the 0.05 level ($\chi^2(2, N=139)=5.138, p<.077$). One unfortunate limitation of the study was that practically all position 2 tests occurred prior to position 1 tests.

A series of tests were done comparing the results of the present study to those of Widup and Barland (1996). The frequencies of outcomes (DI, NDI, and inconclusive) of

both studies (Table 9) were compared to assess if outcome differed as a function of study (present study vs. Widup & Barland, 1996). The results were statistically significant ($\chi^2 (2, N=1135)=43.13, p<.05$) at the 0.05 level. It seemed that there was a difference in the proportion of DI, NDI, and inconclusive outcomes between the studies. In Table 10, the number of decisions (DI and NDI combined) and inconclusives were compared to assess if there was a difference between studies. The results were significant ($\chi^2 (1, N=1135)=36.54, p<.05$) at the 0.05 level. Widup and Barland's study had significantly more tests with inconclusive outcomes. In Table 11, the ratios of DI and NDI were compared between the studies. The results were statistically significant ($\chi^2 (1, N=996)=51.18, p<.05$) at the 0.05 level. Widup and Barland's study had significantly fewer tests with outcomes of no deception indicated.

Discussion

The analysis of 653 polygraph tests found no significant difference between outcomes as a function of position of the KLT. The results were consistent with the findings of Widup and Barland (1996). However, it should be noted that there was a confounding factor in the current research.

With the exception of the final nine records, the data in the current study consisted of polygraph tests which had already been completed during the last five years. At the beginning of that period, the examiner completed the KLT between the first and second chart (position 2). On 10-1-98, the examiner changed his procedure and began conducting the KLT before the first chart (position 1). This change produced the opportunity to compare outcomes when the KLT was in each of the two positions. Unfortunately, it also meant that position of the KLT was confounded with experience of the examiner (and also

with polygraph instrument, since the type of instrument was changed twice during the time that the KLT was in position 2). Therefore, it is important to consider how these confounds might affect the results of the study.

The position 2 tests were completed before the position 1 tests. Since inconclusives decrease with experience, this confound should increase the likelihood of position 1 tests showing fewer inconclusive outcomes. The fact that no significant difference was found between the two positions suggests even more strongly that position 1 is not a better technique than position 2. Position 1 would have the advantage of not only its placement during the polygraph test but also the confound of experience helping to produce statistically significant results.

On the other hand, position 2 tests were completed when the confound of examiner experience would produce more inconclusives. The superiority of position 2 might fail to be recognized because of the greater number of inconclusives due to lack of examiner experience. In order to test this possibility, the confound between experience of the examiner and position of the KLT must be eliminated by conducting tests in which position of the KLT was randomly assigned. At the time that the present study was completed, only nine tests had been completed using this random assignment procedure.

It is important to note that the results of the present study were obtained over a large number of examinees. Even if examiner experience affected the results, the actual frequencies offer little empirical support for suggesting that the position of the KLT had any practical significance. Widup and Barland (1996) reached a similar conclusion in their study, which differed from the present study in a number of significant ways. The statistical comparisons show that the ratio of DI, NDI, and inconclusive outcomes were significantly different between their study and the present study. Although both were field studies, there

are many other notable differences as well. The number of examiners (one vs. multiple), the setting (central Pennsylvania vs. several places inside and outside the U. S.), and the examinees (civilian vs. military) differed. Such differences greatly increase the likelihood that these results would generalize across a wide range of settings. The lack of significant differences from having the KLT in different positions suggests that attention should now be focused on the more fundamental issue of whether the KLT should be used at all.

References

- Abrams, S. (1978). The utilization and effectiveness of the stimulation test. Polygraph, 7(3), 178-181.
- American Polygraph Association. (1997). The validity and reliability of polygraph testing. Polygraph, 26(4), 215-239.
- Ansley, N. (1990). The validity and reliability of polygraph decisions in real cases. Polygraph, 19(3), 169-179.
- Ash, P., Slora, K., & Britton, C. (1990). Police agency officer selection practices. Journal of Police Science & Administration, 17(4), 258-269.
- Barland, G. H. (1978a). An introduction to the number test. Polygraph, 7(3), 173-175.
- Barland, G. H. (1978b). A fail-proof blind numbers test. Polygraph, 7(3), 203-208.
- Bradley, M. T., & Janisse, M. P. (1981). Accuracy demonstrations, threat, and the detection of deception, cardiovascular, electrodermal, and pupillary measures. Psychophysiology, 18(3), 307-315.
- Bradley, M. T., MacLaren, V. V., & Black, M. E. (1996). The control question test in polygraphic examinations with actual controls for truth. Perceptual and Motor Skills, 83, 755-762.
- Capps, M. H., & Ansley, A. (1992). Anomalies: The contributions of the cardio, pneumo, and electrodermal measures towards a valid conclusion. Polygraph, 21(4), 321-338.
- Elaad, E., & Kleiner, M. (1990). Effects of polygraph chart interpreter experience on psychophysiological detection of deception. Journal of Police Science and Administration, 17(2), 115-123.

- Fingerhut, K. R. (1978). Use of the stimulation test in pre-employment testing. Polygraph, 7(3), 185-187.
- Hickman, R. C. (1978). Usefulness and the theory of the stimulus test. Polygraph, 7(3), 182-184.
- Honts, C. R., Raskin, D. C., & Kircher, J. C. (1994). Mental and physical countermeasures reduce the accuracy of polygraph tests. Journal of Applied Psychology, 79(2), 252-259.
- Horvath, F. (1993). Polygraphic screenings of candidates for police work in large police agencies in the United States: A survey of practices policies, and evaluative comments. American Journal of Police, 12(4), 67-86.
- Jayne, B. C. (1995). Child sexual abuse investigations. Polygraph, 24(1), 34-47.
- Krsrich, D. A. (1997). Applications of polygraph to the psychopathic person. Polygraph, 26(2), 107-114.
- Merrill, W. F. (1995). The art of interrogating rapists. Polygraph, 24(1), 6-11.
- Olsen, D. E., Harris, J. C., Capps, M. H., & Ansley, A. (1997). Computerized polygraph scoring system. Journal of Forensic Science, 42(1), 61-71.
- Patrick, C. J., & Iacono, W. G. (1991). Validity of the control question polygraph test: The problem of sampling bias. Journal of Applied Psychology, 76(2), 229-238.
- Senese, L. (1976). Accuracy of the polygraph technique with and without card test stimulation. Journal of Police Science and Administration, 4(3), 274-276.
- Widup, R., & Barland, G. H. (1996). The numbers test: The effect of the location of the numbers test in examinee decision rates in criminal psychophysiological detection of deception. Polygraph, 25(4), 256-265.

Table 1

Gender of the Examinee As a Function of Position of the KLT

| | | Gender of Examinee | | Total |
|------------------------|------------|--------------------|--------------|---------------|
| | | Male | Female | |
| Position of the KLT | Position 1 | 104 (72%) | 41 (28%) | 145 (100%) |
| | Position 2 | 350 (69%) | 158 (31%) | 508 (100%) |
| Total | | 454 (70%) | 199 (30%) | 653 (100%) |

Table 2

Role of the Examinee As a Function of Position of the KLT

| | | Role of the Examinee | | | | Total |
|------------------------|------------|----------------------|-------------|------------|------------|---------------|
| | | Suspect | Victim | Witness | Accused | |
| Position of the KLT | Position 1 | 116 (80%) | 19 (14%) | 5 (3%) | 5 (3%) | 145 (100%) |
| | Position 2 | 408 (80%) | 68 (14%) | 26 (5%) | 6 (1%) | 508 (100%) |
| Total | | 524 (80%) | 87 (13%) | 31 (5%) | 11 (2%) | 653 (100%) |

Table 3

Gender of Examinee As a Function of Role of the Examinee and Position of KLT

Count

| POSITION OF KNOWN LIE TEST | | | GENDER OF EXAMINEE | | Total |
|-------------------------------|---------------------|---------|-----------------------|--------|-------|
| | | | MALE | FEMALE | |
| POSITION 1 | ROLE OF EXAMINEE | SUSPECT | 86 | 30 | 116 |
| | | VICTIM | 8 | 11 | 19 |
| | | WITNESS | 5 | | 5 |
| | | ACCUSED | 5 | | 5 |
| | Total | | 104 | 41 | 145 |
| POSITION 2 | ROLE OF EXAMINEE | SUSPECT | 314 | 94 | 408 |
| | | VICTIM | 13 | 55 | 68 |
| | | WITNESS | 17 | 9 | 26 |
| | | ACCUSED | 6 | | 6 |
| | Total | | 350 | 158 | 508 |

Table 4

Role of the Examinee As a Function of Type of Case

| Count | | ROLE OF EXAMINEE | | | | Total |
|--------------------|-------------------------|------------------|--------|---------|---------|-------|
| | | SUSPECT | VICTIM | WITNESS | ACCUSED | |
| TYPE OF CASE | CHILD SEX OFFENSE | 107 | 18 | 2 | 5 | 132 |
| | SEX OFFENSE | 48 | 30 | 4 | 3 | 85 |
| | CHILD PHYSICAL ABUSE | 15 | | | | 15 |
| | THEFT | 193 | 9 | 2 | | 204 |
| | HOMICIDE | 27 | | 6 | | 33 |
| | ARSON | 28 | 12 | 3 | | 43 |
| | ROBBERY | 11 | 4 | | | 15 |
| | SUSPICIOUS DEATH | 8 | | 11 | | 19 |
| | BURGLARY | 48 | 3 | 1 | 1 | 53 |
| | ASSAULT | 5 | 3 | 1 | | 9 |
| | MISSING PERSON | 1 | 3 | 1 | | 5 |
| | DRUG OFFENSE | 5 | | | 1 | 6 |
| | FIREARMS VIOLATION | 1 | | | | 1 |
| | FALSE REPORTS | | 2 | | | 2 |
| | ESCAPE | 1 | | | | 1 |
| | CORRUPTION OF MINORS | 1 | | | | 1 |
| | PROPERTY CRIMES | 16 | | | | 16 |
| | HARRASSMENT | 9 | 3 | | 1 | 13 |
| Total | 524 | 87 | 31 | 11 | 653 | |

Table 5

Outcome of the Test As a Function of Type of Case

| Count | | OUTCOME OF THE TEST | | | Total |
|--------------|----------------------|---------------------|------------------------|--------------|-------|
| | | DECEPTION INDICATED | NO DECEPTION INDICATED | INCONCLUSIVE | |
| TYPE OF CASE | CHILD SEX OFFENSE | 72 | 52 | 8 | 132 |
| | SEX OFFENSE | 52 | 24 | 9 | 85 |
| | CHILD PHYSICAL ABUSE | 7 | 7 | 1 | 15 |
| | THEFT | 104 | 90 | 10 | 204 |
| | HOMICIDE | 11 | 18 | 4 | 33 |
| | ARSON | 18 | 21 | 4 | 43 |
| | ROBBERY | 12 | 2 | 1 | 15 |
| | SUSPICIOUS DEATH | 3 | 14 | 2 | 19 |
| | BURGLARY | 29 | 22 | 2 | 53 |
| | ASSAULT | 5 | 2 | 2 | 9 |
| | MISSING PERSON | 4 | 1 | | 5 |
| | DRUG OFFENSE | 4 | 2 | | 6 |
| | FIREARMS VIOLATION | 1 | | | 1 |
| | FALSE REPORTS | | 2 | | 2 |
| | ESCAPE | | | 1 | 1 |
| | CORRUPTION OF MINORS | 1 | | | 1 |
| | PROPERTY CRIMES | 8 | 6 | 2 | 16 |
| | HARRASSMENT | 8 | 4 | 1 | 13 |
| | Total | 339 | 267 | 47 | 653 |

Table 6

Outcome of Polygraph Tests As a Function of Position of the KLT

| | | Outcome of the Test | | | Total |
|------------------------|------------|---------------------|--------------|--------------|---------------|
| | | DI | NDI | Inconclusive | |
| Position of the KLT | Position 1 | 71 (49%) | 65 (45%) | 9 (6%) | 145 (100%) |
| | Position 2 | 268 (53%) | 202 (40%) | 38 (7%) | 508 (100%) |
| Total | | 339 (52%) | 267 (41%) | 47 (7%) | 653 (100%) |

Table 7

Decisions or Inconclusives As a Function of Position of the KLT

| | | Outcome of the Test | | Total |
|------------------------|------------|---------------------|--------------|---------------|
| | | DI & NDI | Inconclusive | |
| Position of the KLT | Position 1 | 136 (94%) | 9 (6%) | 145 (100%) |
| | Position 2 | 470 (93%) | 38 (7%) | 508 (100%) |
| Total | | 606 (93%) | 47 (7%) | 653 (100%) |

Table 8

Decisions or Inconclusives As a Function of Position of the KLT and Time of Test

| | | Outcome of the Test | | Total |
|------------------------|------------|---------------------|--------------|---------------|
| | | DI & NDI | Inconclusive | |
| Position of the KLT | Position 1 | 41 (89%) | 5 (11%) | 46 (100%) |
| | 1a | 47 (100%) | | 47 (100%) |
| | 1b | 43 (93%) | 3 (7%) | 46 (100%) |
| | 1c | | | |
| | Total | 131 (94%) | 8 (6%) | 139 (100%) |
| Position 2 | 2a | 143 (85%) | 25 (15%) | 168 (100%) |
| | 2b | 159 (95%) | 9 (5%) | 168 (100%) |
| | 2c | 165 (98%) | 2 (4%) | 169 (100%) |
| | | | | |
| | Total | 467 (92%) | 38 (8%) | 505 (100%) |

Table 9

Outcome of Polygraph Test as a Function of Study

| | | Outcome of the Test | | | |
|-----------------|--|---------------------|--------------|--------------|----------------|
| | | DI | NDI | Inconclusive | Total |
| Widup & Barland | | 305 (63%) | 85 (18%) | 92 (19%) | 482 (100%) |
| Present Study | | 339 (52%) | 267 (41%) | 47 (7%) | 653 (100%) |
| Total | | 644 (57%) | 352 (31%) | 139 (12%) | 1135 (100%) |

Table 10

Decision or Inconclusive as a Function of Study

| | | Outcome of the Test | | |
|-----------------|--|---------------------|--------------|----------------|
| | | DI & NDI | Inconclusive | Total |
| Widup & Barland | | 390 (81%) | 92 (19%) | 482 (100%) |
| Present Study | | 606 (93%) | 47 (7%) | 653 (100%) |
| Total | | 996 (88%) | 139 (12%) | 1135 (100%) |

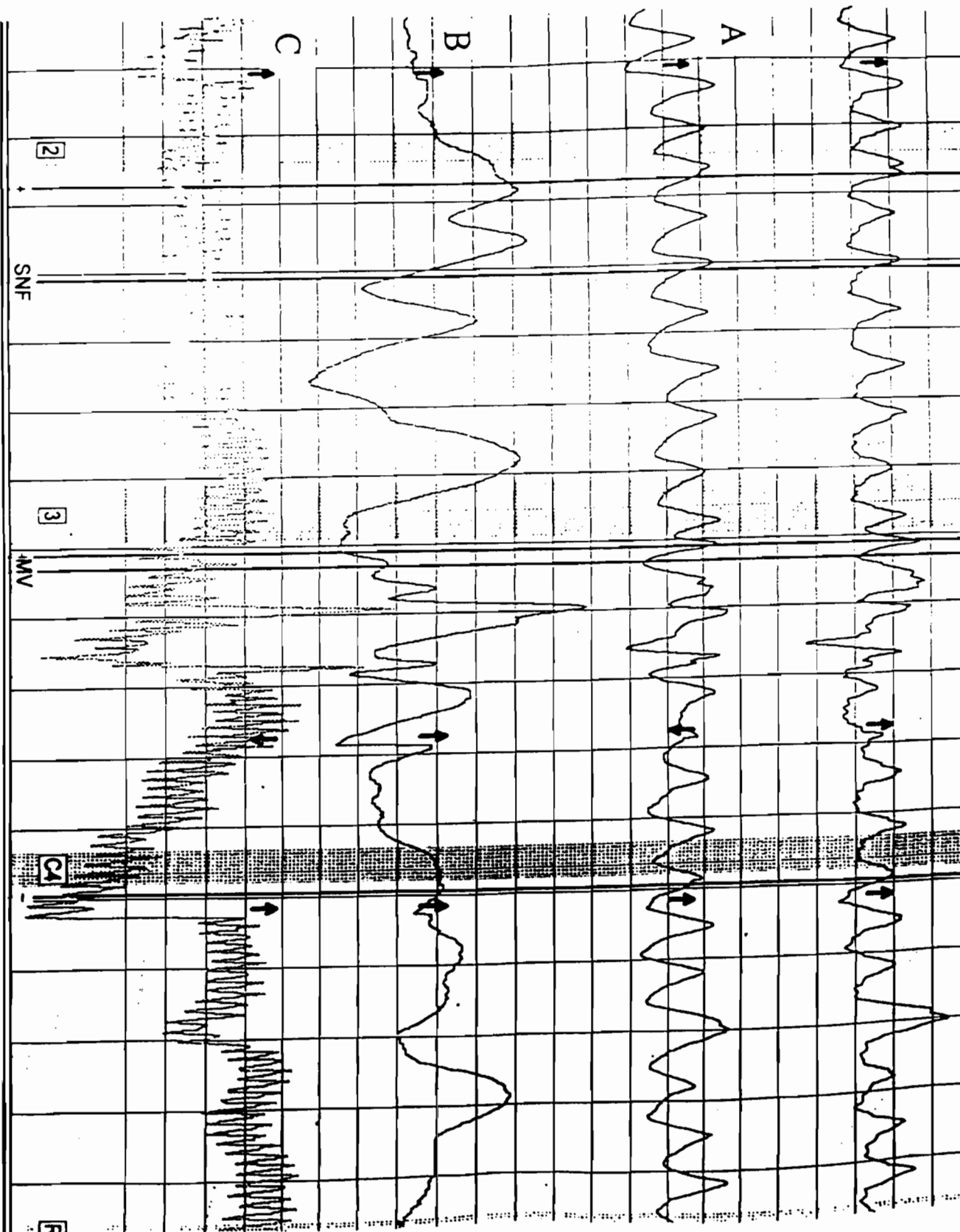
Table 11

Deception Indicated or No Deception Indicated as a Function of Study

| | Decision of the Test | | Total |
|-----------------|----------------------|--------------|---------------|
| | DI | NDI | |
| Widup & Barland | 305 (78%) | 85 (22%) | 390 (100%) |
| Present Study | 339 (56%) | 267 (44%) | 606 (100%) |
| Total | 644 (65%) | 352 (35%) | 996 (100%) |

Appendix A

Example of a Polygraph Chart



2

SNF

3

MV

4

R

| Gain Settings: | P2 | P1 | GS | CA |
|-----------------|-----|-----|-----|-----|
| Recorded: Start | 5.0 | 2.3 | 2.5 | 3.0 |
| Recorded: End | 5.0 | 2.3 | 2.5 | 3.0 |
| Printed: Start | 5.0 | 2.3 | 2.5 | 3.0 |
| Printed: End | 5.0 | 2.3 | 2.5 | 3.0 |

Appendix B

Question List for MGQT

1. Is today_____? (Irrelevant)
2. Is the month_____? (Irrelevant)
3. Did you plan with anyone to cash those traveler's checks? (Relevant)
4. Is the year_____? (Irrelevant)
5. Did you steal those traveler's checks? (Relevant)
6. Have you ever stolen anything that did not belong to you? (Comparison)
7. Are you now in the Commonwealth of Pennsylvania? (Irrelevant)
8. Are you withholding any information about those traveler's checks? (Relevant)
9. Did you cash those traveler's checks knowing that they were stolen? (Relevant)
10. Did you ever steal from your parents? (Comparison)

Chart III (Mixed)

2-1-5-6-4-3-10-9-6-8-10

Appendix C

Question List for MZC

1. Chart I-Is today _____? (Irrelevant)
Chart II-Is the month _____? (Irrelevant)
Chart III-Is the year _____? (Irrelevant)
2. Regarding that _____, do you intend to answer each question truthfully?
(Sacrifice Relevant)
3. (Question that is not recorded by the polygraph instrument)
4. While working at _____, did you ever steal any merchandise, property, or money?
(Comparison)
5. Did you steal that money? (Relevant)
6. Have you ever stolen anything that did not belong to you? (Comparison)
7. Did you steal any part of that money? (Relevant)
8. (Question that is not recorded by the polygraph instrument)
9. While in high school, did you ever shoplift anything of value? (Comparison)
11. Were you present when that money was stolen? (Relevant)

Appendix D

Numerical Analysis Data Sheet for Polygraph Tests

| PENNSYLVANIA STATE POLICE | | | | |
|-------------------------------|----|----|----|----|
| NUMERICAL ANALYSIS DATA SHEET | | | | |
| CHART I | 3 | 5 | 8 | 9 |
| PNEUMO | -1 | 0 | -1 | 0 |
| GALVO | 0 | 1 | -1 | -1 |
| CARDIO | -1 | -1 | -1 | 0 |
| SUBTOTAL | -2 | 0 | -3 | -1 |
| CHART II | 3 | 5 | 8 | 9 |
| PNEUMO | 0 | -1 | -1 | 1 |
| GALVO | 1 | 1 | 0 | -1 |
| CARDIO | 0 | -1 | -1 | 0 |
| SUBTOTAL | 1 | -1 | -2 | 0 |

Appendix D (continued)

Numerical Analysis Data Sheet for Polygraph Tests

PENNSYLVANIA STATE POLICE

NUMERICAL ANALYSIS DATA SHEET

| | | | | |
|-----------|----|----|----|----|
| CHART III | 3 | 5 | 8 | 9 |
| PNEUMO | -1 | 0 | -1 | 1 |
| GALVO | -1 | 0 | 1 | -1 |
| CARDIO | -1 | -1 | -1 | 0 |
| SUBTOTAL | -3 | -1 | -1 | 0 |

| | | | | |
|------------|----|----|----|----|
| SPOT TOTAL | -4 | -2 | -6 | -1 |
|------------|----|----|----|----|

Subject Name: _____ Incident # _____

Examiner: K. Davis Station: _____Conclusion: DI Date: _____