AAPP

Examiner Handbook

Revised 2013

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Preface

This document was originally written by Dave Renzelman and John Mata in 1999 and submitted to the American Association of Police Polygraphists (AAPP) for publication. Dave was then the Director of Quality Control for AAPP. John, then the AAPP President, published this document as the "Examiner's Handbook, March 1999."

This edition was modified and revised in 2008 by Elmer Criswell, the current Quality Control Director of AAPP, and Barry Cushman, the AAPP Chaplain with the Portland (ME) Police Department. The 2013 revision includes the wisdom, advice, and additions by Mark Handler, the AAPP Research & Information Director. The revision was completed with the advice, knowledge, and approval of both Dave and John.

This document is provided for the exclusive and sole use of properly trained and recognized polygraph examiners as a ready reference. It is recommended that you keep it available during each examination that you conduct.

Treat this document as if it were sensitive; as if it were to be placed in the wrong hands, it could cause an inexperienced examiner some difficulty in administering examinations as it, for the most part, presumes a solid foundation in the science of polygraph.

Each page incorporates new line numbering. The purpose is to provide a quick and ready reference when examiners are communicating with each other. e.g., "…look on page two (02) line twelve (12)."

The techniques and procedures described herein are solely those identified and recorded by Dave Renzelman, John Mata, Elmer Criswell, Barry Cushman, and Mark Handler and do not constitute an official endorsement by any one person or organization.

CHAPTER ONE

PDD ETHICS & STANDARDS OF PRACTICE

The American Association of Police Polygraphists (AAPP), the American Polygraph Association (APA), the National Polygraph Association (NPA), and the American Society for Testing & Materials (ASTM International) as well as the various state and regional polygraph associations have all adopted ethical requirements and standards of practice requirements outlining the proper way to conduct polygraph examinations. Obviously, those that are listed by AAPP only apply to AAPP members just as the APA's and NPA's and the various state and regional polygraph associations' policies, ethical standards, and general standards of practice apply only to APA and NPA members and state and regional polygraph associations, respectively.

ASTM International standards, however, apply to all PDD polygraphists. They also regulate other detection of deception practices, which includes voice stress analysis. The standards apply to all detection of deception practitioners regardless of whether or not the person is a member of ASTM International. The standards are voluntary, consensus standards established by practitioners in the field. These practitioners are from law enforcement, private, government, research, instrument manufacturing, PDD training schools, and other areas.

Approved and published ASTM International standards become the accepted standard of practice for the particular field they address. ASTM International does not enforce the standards. Professionals within the field or other members of society address enforcement of the standards through lawsuits and injunctions.

If a particular PDD polygraphist engages in incompetent and/or unethical practices, particularly where no licensing standards exist, individuals or polygraph associations may file for injunctions to stop the polygraphist from further practice. Violation of ASTM International standards can be used as primary evidence in conjunction with the verified evidence of improper behavior. AAPP and APA ethics and standards of practice and that of the various state and regional polygraph associations may be offered as supporting evidence regardless whether or not the person is a member of any professional polygraph association. NPA has no published standards of practice available for supporting evidence.

A person who has failed a polygraph examination for which any negative consequence has occurred (e.g., loss of employment, arrest, failur*e* to get employment, etc.) could file a civil action. As with an injunction, ASTM International, AAPP, APA, and the various state and regional polygraph associations' ethics and standards of practice could be used as primary or supporting evidence to support the civil suit. Again, membership in any particular association is inconsequential. In those jurisdictions where licensing of detection of deception practices exist, the various aforementioned standards would become secondary evidence to the licensing standards.

The standards listed below are summarizations and paraphrased versions of the various standards of practice and ethics standards of the various organizations. Exact wording may not be used in the case of any ASTM International standard as they are protected by copyright.

1. The polygraphist should have sole responsibility to determine if any particular examination should take place and the time and location of said examination.

2. A polygraph examination should never be conducted when, in the polygraphist's opinion, poor examination atmosphere and/or surrounding(s) prevail.

3. The polygraphist shall not attempt to make a physical or psychiatric diagnosis of the examinee, but he is to make a determination as to the testability of the person prior to the polygraph examination.

4. The examination of persons not medically, physically, or psychologically able to be tested is unethical.

5. Unless there is a legal requirement to do so, unauthorized release of test information and results or disclosure of personal information not relevant to the tested issue(s) which may embarrass or tend to embarrass the person or another is unethical (e.g. married examinee admits to affair during a non-marital type examination, etc).

6. Improper physical and sexual advances are unethical and may also be criminal violations.

7. Circumvention of the law by willful violation of E.P.P.A., A.D.A., E.E.O.C., state licensing, and/or other state or federal laws is unethical.

8. Use of non-recognized test procedures or use of "self made" test procedures or techniques is unethical.

9. Polygraphists are to utilize Quality Control. The person performing the Quality Control must have formal, classroom (or on-line) training in the technique/format being reviewed as well as the scoring system being used.

10. It is unethical to render a conclusive diagnosis when the physiological records lack sufficient quality and clarity which may include, but is not limited to, excessively distorted recordings possibly due to manipulations by the examinee, recordings with insufficient responsivity, or recordings with tracing amplitudes less than that generally accepted by the profession.

11. It is unethical to solicit or accept fees, gratuities, or gifts that are intended to influence an opinion, decision, or report. A polygraphist may not set any fee for polygraph services which is contingent upon the findings or results of such services. Further a polygraphist may not change a fee as a direct result of an opinion or decision subsequent to a polygraph examination.

12. It is unethical to knowingly submit, or permit employees to submit, a misleading or false polygraph examination report. Each polygraph report shall be a factual, impartial, and

objective account of information developed during the examination, and the polygraphist's professional conclusion based on analysis of the polygraph data.

13. It is unethical to include in any polygraph examination, questions intended to inquire into or develop information on activities, affiliation, or beliefs on religion, politics, or race except when there is relevancy to a specific investigation.

14. It is unethical for any polygraphist to engage in any testing situation where a known conflict-of-interest exists.

15. Polygraph examinations for clinical (*post*-conviction) polygraph examination of sex offenders shall be conducted only by polygraphists who have completed 40 hours of specialized training for sex offender polygraphs consistent with published guidelines of various related organizations. Conducting these tests, without successful completion and certification as well as required continuing education hours, constitutes an ethical violation.

16. The polygraph shall be given a functionality or calibration test consistent with manufacturer recommendations. The functionality or calibration test shall be administered prior to all evidentiary examinations (those in which the results are likely to part of a criminal, civil, or administrative hearing). At a minimum, these tests shall be retained by the polygraphist for no less than one year. Compliance with local, state and federal law is required.

17. Polygraphists who perform polygraph examinations for public viewing shall not render opinions based on the examination as to the veracity of the examinees. Polygraphists shall ensure that reenactments of polygraph examinations are conveyed as such to viewers. To do otherwise is unethical.

18. Prior to the examination, a polygraphist shall dedicate sufficient time to identify the issues and any potential problems in any area of testing. The polygraphist shall obtain information sufficient to identify the examinee before the examination. The polygraphist shall obtain the consent of the examinee prior to testing. Sufficient time shall be taken to ensure that the examinee has a reasonable understanding of the polygraph process and the requirement for cooperation. Sufficient time shall be spent discussing the issues to be tested and allowing the examinee to fully explain his or her answers. Sufficient time shall be taken to ensure the examinee recognizes and understands each question. Attempts by the examinee to rationalize should be neutralized by a pretest discussion in which the examinee demonstrates an understanding of the test questions to have the same meaning as held by the polygraphist. Questions shall be asked in a form that prevents a reasonable person, facing a significant issue, from successfully engaging in a rationalization process to attempt to avoid culpability.

19. It is unethical for a polygraphist to express bias in any manner about the truthfulness of the examinee prior to the completion of testing.

20. A polygraphist shall use a testing technique which research supports as valid. Evidentiary examinations shall not materially deviate from the protocol of a validated testing technique.

Where specific-issue examinations deviate from the format or protocol of a validated testing technique, such deviation shall be noted and justified in writing when the test is subjected to quality control by a reviewing polygraphist. For the resolution of specific issues, each polygraph examination shall include a validated testing technique.

21. An Acquaintance Test or Demonstration Test shall be required before the conduct of an evidentiary examination.

22. Questions shall be balanced in terms of length and impact for each category of questions utilized. Questions used in the assessment of truth and deception shall be preceded and followed by time intervals of not less than 20 seconds from stimulus onset to stimulus onset of the following question~~s~~.

23. Polygraphists shall collect a sufficient number of charts so as to acquire sufficient data for proper evaluation, in conformance with a validated testing technique or any testing technique recognized by the polygraph profession as acceptable. All techniques require a minimum of three, separate charts be collected for deception tests (specific-issue and employment screening examinations) as well as recognition tests (peak-of-tension). Many techniques require three or more charts be collected (at least three "askings" of the relevant and comparison questions). Three charts are the universally-recognized standard to collect sufficient data for proper test data analysis and the required standard for most computer scoring algorithms. PolyScore requires four charts be collected on "You Phase" ZCT examinations in order to be considered a valid, algorithm analysis. Some employment screening examinations require only two separate charts, but the relevant questions are asked twice in both charts which suffices for the three "askings" requirement.

24. It is unethical for any polygraphist to base his/her polygraph test opinion(s) solely on the basis of a computer scoring algorithm. Quantitative or numerical scoring, by other than computer scoring algorithms is required ("hand-scoring") for all evidentiary and specific-issue type examinations. Under no circumstances are computer scoring algorithms to be consulted before a manual "handscore" has been performed and determined by the Examiner.

25. Polygraphists are required to participate in a minimum of 20 hours of annual continuing education in polygraph-related courses after graduation from basic polygraph training in order for their certification to be considered as "current." Such training is to occur at any state, regional or national polygraph seminar or other course or institution recognized by the AAPP for its polygraph-related content.

26. It is unethical for a polygraphist to tell an examinee that he/she is deceptive or lying to the RQ's when the test data clearly indicates that he is non-deceptive.

27. It is unethical for a polygraphist to report to the examinee that he/she is "having problems" or "possibly lying" to the CQ's prior to all charts being collected.

28. It is unethical to attempt to have any polygraph test or test results or testimony entered into any judicial or other evidentiary (courts, probation/parole boards, employment disciplinary

hearings, etc.) without first having had the complete examination evaluated by a qualified Quality Control person.

THERE ARE MANY OTHER REQUIRED ETHICAL PRACTICES AND STANDARDS AND PRINCIPLES OF PRACTICE NOT LISTED HERE THAT ARE PART OF THE AFOREMENTIONED PROFESSIONAL ORGANIZATIONS. IT IS INCUMBENT UPON EACH POLYGRAPHIST TO APPRISE HIMSELF OF THESE REQUIRED STANDARDS OF THE POLYGRAPH PROFESSION SO AS NOT TO BE FOUND (INADVERTANTLY) IN VIOLATION OF ANY STANDARD(S).

CHAPTER TWO

SUGGESTED BEST PRACTICES

The following "Best Practices" do not represent any particular person, school, agency, or group and have been espoused and taught frequently at state, regional, and national polygraph seminars as the suggested way that we conduct various types of polygraph examinations. The purpose is to have effective techniques as well as techniques that are as closely-aligned to scientifically-supported methods as possible, as fair as possible to our Examinees, and well within the boundaries of our stated ethics and standards of practice.

1. Be proficient in at least three (3) screening and three (3) single-issue test techniques.

2. Use quality control whenever possible and always with examinations that are being considered for evidentiary or court-appearance purposes before offering the examinations as evidence.

3. Realize that any examination(s) on *mens rea*; e.g., state of mind, criminal intent or purpose, *etc.* at the time of an act or immediately before an act are extremely dangerous and "mistake-prone" and should be avoided.

4. Be prepared for countermeasures.

5. Record all examinations from beginning to end with video/audio recording.

6. Use an acquaintance test or demonstration test before doing any deception tests.

7. Be thorough but not unnecessarily lengthy in the pre-test interview and "weave" your comparison question discussions into the flow.

8. Attempt to spend equal time (as reasonably as possible) developing and introducing comparison questions as you do when developing and introducing relevant questions.

9. You must not conduct any examination unless, at a minimum, you have two pneumograph channels, one electrodermal channel, one cardiosphygmograph channel, one countermeasures movement sensor that are all in proper working order. If one of these channels fails to work properly during an examination, you must end the examination until the channel problem has been successfully resolved.

10. The plethysmograph channel is strongly recommended, but it may not be substituted for a cardiosphygmograph channel as was done in the 1970's and 1980's since the physiological indices that these monitor, are not the same physiological indices that are monitored by a cardiosphygmograph channel.

11. Essential questions in any examination are the irrelevant questions (IQ), relevant questions (RQ), comparison questions (CQ), and sacrifice relevant question (SRQ) or its equivalent (Marcy Introductory Stimulation Question, Arther Known Truth Crime Question, etc., depending upon the technique/format used). A RQ must not be the first evocative question asked since we will not know whether any physiological change is the result of deception or the result of the first relevant question being asked and answered.

12. Relevant questions must be as narrow and specific as possible without being lengthy; whereas, comparison question must be as broad as possible to encompass as much prior behavior as possible in the interest of being as fair as possible to the Examinee.

13. Comparison questions should not be pre-determined – they should be based on the examinee's discussions during the pre-test interview – the questions must be made to "fit the examinee" – the examinee must not be made to "fit" pre-selected comparison questions.

14. There must be at least three charts (separate askings of RQs and CQs) in any deception test technique as well as any recognition test technique (except for the CIT which has different parameters). Screening test techniques may vary from this where only two charts may be conducted, but the RQs and CQs are asked twice in both charts thus they are presented four times.

15. Rotating RQs and/or CQs, if allowable by the technique rules should produce better and more balanced results (NCCA does not allow rotation of RQs in either of its ZCT test formats but does allow and recommends the CQs be rotated).

16. Use single-issue testing techniques/formats whenever possible since they are the most-accurate types of examinations. If you have a crime situation that has three possible facets on which testing can be done, designing three single-issue examinations would most-accurately resolve the situation. If the examinee successfully passes the first examination, then the second one can be administered on that day or a separate day as determined by the polygraphist's evaluation of the examinee's potential to successfully complete a second examination. In most criminal situations, the suspect will fail the first examination if a thorough investigation was completed that determined the examinee to be a suspect, and subsequent examinations will not be necessary.

17. Use the "successive hurdles" approach for screening tests – a multiple-issue initial examination (no more than five RQs), and then a single-issue, follow-up examination if consistent reactions appear in one of the questions, and then a "clearing" examination which involves all of the initial questions without the one for which the single-issue examination was conducted. Using this approach may require the examinee to return on a different day to complete all examinations.

18. In screening tests, comparison questions should be disguised as much as possible to avoid employment of countermeasures on the examination. These are discussed and taught at many seminars, printed articles, and some basic polygraph training schools.

19. Use validated scoring practices – try to bracket each RQ with CQs and score to the best/strongest parameter (tracing) in each spot; e.g., in a ZCT test compare the cardio tracing in RQ5 to CQ4 because it is stronger than CQ6, and compare the EDA in CQ6 to RQ5 because it is stronger than the EDA in CQ4, etc. Obviously, if you are using a Backster or Matte ZCT, then different scoring rules would apply.

20. Seven-position scoring programs will normally produce better results than three-position scoring programs. Regardless if three point NCCA scoring or seven point NCCA or Utah scoring or ESS Scoring is used, "hand-scores" must always be conducted before computerized scoring algorithms are consulted.

21. All scoring algorithms are not appropriate for all techniques since "hand-scores' are conducted differently with the various techniques. Most algorithms are not appropriate for directed lie comparison question tests unless specifically-stated as such in the algorithm with specific directions to use with DLC tests.

22. When tests are inconclusive because of artifacts or not enough useful data has been collected, then additional charts may be collected as long as doing so falls into allowable parameters of the particular technique/format; otherwise, the Examinee would have to be given a re-examination on a different day.

23. Conduct every polygraph examination as if it were going to be used in court in an evidentiary hearing. By following this procedure, you should be prepared, in advance, to be able to defend your work product if it is questioned by anyone.

There are more "best practices" that are determined or that "appear on the horizon" as our techniques need modified in line with the changes that are dictated by more current research being released on a frequent basis. As research dictates, we may have to modify, add to, or even eliminate what we once thought was a "best practice." Like most of our polygraph practices have been over the last 50 years, best practices are fluid.

1. Krapohl, Donald J., "Best Practices" Presentation, 2005.
2. "Best Practices" – various AAPP & APA Seminars 2005 – 2012.

CHAPTER THREE

QUALITY CONTROL (QC)

Each law enforcement or criminal justice agency utilizing polygraph should develop and maintain a written set of Standard Operating Procedures for the conduct of its polygraph QC Program.

QC procedures should be independent and objective, without undue influence of the original examiner or other sources, such as management or attorneys.

All polygraph reports, technical documents and charts should undergo QC review to ensure satisfactory tracing quality and correctness of the examiner's opinion. It should be imperative that any polygraph test work product that will be used in any judicial or evidentiary proceeding requiring testimony as to that work product will have withstood thorough quality control review before it is offered as evidence in said proceeding.

When appropriate and warranted, the QC official should have the authority to direct or at least recommend a reexamination.

Each examiner should consider establishing his own individual and personal policy to ensure the results of an examination are not considered final until the examination has been reviewed by QC.

QC should include, but not be limited to, the following:

- A blind analysis of the collected test data by an independent examiner familiar with and qualified to conduct the testing technique used.

- A final opinion of the QC Official as to the test data analysis, providing one of the following opinions.

    - Deception Indicated DI
    - No Deception Indicated NDI
    - No Opinion NO
    - Inconclusive INC
    - Significant Response SR
    - No Significant Response NSR

        - The term inconclusive is now recommended by NCCA (National Center for Credibility Assessment), and supported by AAPP, to indicate additional testing is necessary and must be accomplished prior to reaching an opinion of DI, NDI, SR, NSR or NO (e.g. testing has not been completed).

- A QC statement that the opinion was supported by proper and acceptable test data analysis procedures.

- A QC statement indicating whether the test data analysis was conducted first by the examiner, then the computer.

- QC shall not accept test results generated solely on computer algorithm scoring.

- Attempt to use initial and blind test data analysis using a seven-position numerical scoring system or the Empirical Scoring System:

- 3	- 2	- 1	0	+1	+2	+3

- Obtain a QC examiner's statement which attests that the relevant questions were proper.

- Obtain a QC examiner's statement which attests that the comparison questions were proper.

- Obtain a QC examiner's statement which attests that the in-test operations were proper which may only be attested through reviewing of an audio or video/audio recording.

- Obtain a QC examiner's statement which attests that the Pneumo and Cardio tracings were no less than ½ inch and no more than 1 inch in amplitude and were of proper sensitivity, stability and amplitude.

- Obtain a QC examiner's statement which attests that the electrodermal (EDA) tracings reflect proper sensitivity, stability, mode and amplitude.

- Obtain a QC examiner's statement which attests that the test question spacing provided sufficient time for the examinee to return to normal from the last stimulus, usually 25 seconds.

- Obtain a QC examiner's statement which attests that that proper and standardized terminology was utilized.

- The QC examiner must be able to produce documentation or other evidence that he/she has had formal training the polygraph technique/format that is being evaluated.

- Abide by the "Process of Exclusion" Rule when a test examinee is determined to be deceptive on the relevant questions (DI decision) or deceptive on the comparison questions (NDI decision). The Process of Exclusion Rule states, "When the examiner states that an examinee is deceptive, it is implied in the statement that the examiner has excluded all factors which may cause deception other than lying as the cause of the deception; e.g., anger, physical or psychological medical condition, examiner error, etc." If there are any factors that were present during the examination phase that were unresolved by efforts of the examiner, then the conclusive opinion should be reserved.

CHAPTER FOUR

VALIDATED TECHNIQUES SUMMARY

In the last few years, there has been an "explosion" of studies completed by various entities to "validate" polygraph techniques and formats. Some of these studies did not succeed in the attempt to validate a particular technique or test format. We should be very cautious when we discuss validation since a particular group may state that some technique or instrument is validated, and what that group is stating is really not what many of the "listeners" think they are hearing.

For example, we have been told and/or have read that various studies have determined that the use of voice-stress for detection of deception purposes is not valid because the studies indicated that the accuracy of voice-stress is only about 35%. What that means is that voice-stress **is valid**; however, its validity is only about 35% so when we hear voice-stress proponents stating that voice-stress has been validated, they are telling the truth.

As part of a 2011 *meta*-analysis study done by the American Polygraph Association (APA), the report listed several techniques or formats that were considered valid based upon defined research protocol. Many polygraphists believe that APA's intent was to place a "stamp-of-approval" or recommend particular techniques or formats. This was not the APA's intent. The *meta*-analysis was done using specific protocol and research design that the researchers developed as the "benchmarks" to reach the necessary standards to have "passed" and met the APA's Standards of Practice. The APA was not making any kind of recommendation based upon the *meta*-analysis that "this technique" should be used or "that technique" should not be used. Many in the polygraph field **incorrectly** perceived that this was the APA subcommittee's intent.

We need to understand that there is a difference between a "technique" and ""format." The techniques developed by Richard Arther, Cleve Backster, the Canadian Police College, John Reid and others are actually "techniques." It means that each required specific protocol in their pre-test stage; specific protocol in their "in-test" or data collection stage; specific protocol in their data evaluation, scoring, and decision rules; and specific protocol in the *post*-test stage (some authorities in the polygraph field do not believe that the "*post*" test phase is actually part of the polygraph test itself, but that is a discussion that will be better-served by those authorities in their own chosen venues).

Simply, because a polygraphist uses a particular question list that may be in the same format as the Backster Zone Comparison Technique or the Reid Technique is **not** using either "technique" unless all of the required protocol was recognized and used throughout the examination. The Backster Zone Comparison Test has three separate "formats" used for specific purposes within the technique. One "format," the "You" Phase, is a single-issue test; whereas, the Exploratory ZCT and SKY ZCT formats have different purposes and are multi-facet rather than being single-issue.

A "single-issue" test is one in which the RQs are narrowly and specifically constructed and only deal with only one facet of an offense; e.g., "Did you shoot that man?" – "Did you shoot that man in his home?" – "Are you the person who shot that man?" It may be a situation in which authorities

know that a suspect did not do the actual shooting but might know who did so the questions might be, "Do you know for sure who shot that man?" – "Can you tell me right now who shot that man for sure?" – "Regarding that man, do you know for sure who shot him?"

Obviously, the single-issue approach gives the lying/guilty person only one area/issue/facet about the crime on which to be a mental, salient target. With the truthful/innocent person, the CQs give them three mental, possibly-salient targets on which to focus and a much greater chance of no errors and of passing the examination. Unfortunately, some polygraphists believe or were improperly-trained to believe that single-issue means they can test on more than one aspect of a crime in which several criminal acts may have occurred against the victim.

For example, in one case recently presented to the AAPP as a "single-issue" examination involved a child who was sexually-assaulted several different times in which vaginal, anal, and oral penetration occurred. The polygraphist asked:

RQ 1 - "Did you stick your erect penis in that child's mouth?"
RQ 2 –"Did you stick your erect penis in that child's vagina?"
RQ 3 –"Did you stick your erect penis in that child's anus?"

The polygraphist scored the examination with an overall score rather than three spot scores and insisted that since the acts all occurred during a single-event it was a single-issue examination the way he/she had constructed it. When the polygraphist, a former law enforcement officer, was asked what crimes he/she would have charged the suspect with had this been a law enforcement examination, and he/she stated that the suspect would have been charged with one count of rape and two counts of deviate sexual intercourse; i.e., three crimes. The polygraphist could not understand that his/her examination was a multi-issue examination, and in order to be single-issue, he/she would have had to construct three separate examinations on each of the crimes.

Multi-facet examinations would be ones in which the technique/format would likely be a MGQT type of examination in which various facets or issues of a crime event could be explored; e.g., "Did you shoot that man?" – "Do you know for sure who shot that man?" – "Were you present when that man was shot?" – "Did you know that man was going to be shot before it happened?" – "Do you know where the gun is that was used to shoot that man?" – "Did you plan with anyone to shoot that man?" – "Did you participate in the shooting of that man?" Any three or four of these questions, depending on the question format/technique selected, could be asked on an examination, but even though the test may "cover" more areas for testing, the lying/guilty suspect is being presented with three or four mental targets on which to focus which leave more room or error and less accuracy.

Multi-issue examinations would be ones in which several crimes may be covered in one test such as the one explained above with the sexual assault on the child as the polygraphist had conducted the test. Pre-employment screening examinations would also be considered multi-issue since the RQs may cover drug activities, involvement in serious crimes, involvement in domestic violence, involvement in sexual crimes (ones illegal everywhere; e.g., rape, child porn, animals, etc.) as well as other department specific topics.

The problem that has arisen from the "validated" techniques situation has been that many polygraphists believe that because a specific-named technique was included on a validated list, that "validation" applies to all question formats within that format. This is an incorrect assumption unless all formats within that technique were separately-validated. Also, the technique protocols would also have had to have been followed properly if the actual examination conducted by the polygraphist was to meet the validated standard.

We have been confronted continually with the issue of the validity and reliability of polygraphy; e.g., accuracy, of our question formats, scoring systems, and polygraph "techniques."

What we are really asking is:

(1) Does the combination of the technique and test data analysis (TDA) have a known error rate?
(2) Is this procedure successful in working accurately when it is conducted properly?
(3) Does this procedure produce reliable results?
(4) Does this procedure have a known error, inconclusive and success rate?

The AAPP Board of Directors has expended extensive time and effort and discussions to determine what techniques and formats are recommended for our Membership to use. The Board has determined that it will recognize what would fit into the Best Practices Model for polygraph testing as we interpret it. The Board has chosen those techniques that were reported in the recent Meta Analytic Survey of Validated Techniques (2011) as having two, independent studies that describe the criterion validity and reliability (e.g., this does not include studies compiled by the persons with financial or proprietary interest in a technique).

Inclusion in the research review required that studies have been published in *Polygraph* or other peer-reviewed scientific publications. Additionally, studies published by an academic degree-granting institution that was accredited by an accrediting agency recognized by the US Department of Education or foreign equivalent are acceptable. Finally, published research of studies funded by government agencies were also considered acceptable as were edited academic texts (to include individual chapters in some cases).

It must also be understood that techniques/formats not on the AAPP Best Practices list **are not considered** as prohibited or improper. If polygraph techniques/formats and TDA models are used other than those on the recommended list, then the burden of proof in an evidentiary hearing is on the polygraphist to provide the scientific evidence in support of accuracy and reliability for that method.

The list of techniques/formats for deception tests that the AAPP Board has interpreted and recognized to fit the Best Practices Model is presented in alphabetical order – not in any order of preference is as follows:

1. Backster "You" Phase Zone Comparison Technique (Two-Spot) with Backster Scoring;

2. Canadian Police College Zone Comparison Technique ("A" Series) with Utah Scoring or ESS (Empirical Scoring System) Scoring;

3. Federal Zone Comparison Test with Federal three-* or seven-position scoring or ESS Scoring;

4. Federal Air Force Modified General Questions Test (Version 1 or 2) with Federal three-* or seven-position scoring or ESS Scoring;

5. Federal "You" Phase Zone Comparison Test with Federal three-* or seven-position scoring or ESS Scoring;

6. Reid Technique using ESS Scoring or with Federal three-* or seven-position scoring;

7. Utah Probable Lie Zone Comparison Test with Utah scoring or ESS Scoring;

8. Utah Directed Lie Zone Comparison Test with Utah scoring or ESS Scoring;

9. Utah Multi-Issue Zone Comparison Test with Utah scoring or ESS Scoring;

*Federal three-position scoring may result in excessive inconclusive results, and the examiner should be prepared to re-score any inconclusive results with another TDA method. The three-position scoring is used more as a training tool than as a practical scoring system; however, there are hybrid variations of three-point scoring which has sufficient research to support its use (e.g., Empirical Scoring System – ESS).

For Screening Tests, the AAPP Board recognizes:

(A) Directed Lie Screening Test (DLST);

(B) LEPET Test (Law Enforcement Pre-Employment Test) (AFMGQT – Version 2);

(C) NCCA Relevant-Irrelevant Screening Test

Other techniques and formats have been included in this document so that AAPP Examiners will see what the proper test formatting for a particular technique is for quality review purposes and may be

able to tell from the format presented if there are any noticeable discrepancies from that in this document. A person that has not had formal classroom training in a particular technique should not be doing a quality control inspection, but there is nothing wrong with doing a cursory review and then referring the Examiner involved to a qualified quality control person to do a complete review.

Again, we stress that no AAPP Member is prohibited from using any of the techniques that are not on the Meta-Analytic Study list. No Member is prohibited from using any of the techniques that are listed in this document; however, they should not use any of the techniques and/or scoring systems for which they have had no formal classroom training (basic polygraph training or polygraph seminars count as "formal classroom training" as would on-line, interactive training). The only requirement is that the Member use the technique as they were properly instructed to use it. If that particular technique/format chosen has not been validated with independent studies, then the polygraphist should be prepared to properly support its use if he/she is called to testify in an evidentiary hearing concerning the polygraph examination that was conducted with a technique/format not on the Best Practices list**.**

It should be noted that many of the techniques which have been named after specific persons evolved from individuals who "blazed the path" for the rest of us and were the true pioneers of this field. Most of those individuals had polygraph schools named after them as well, and, unfortunately, due to their deaths, many of their schools also "disappeared" soon after as the result of their death or for other reasons unrelated; *e.g.*, the Reid College of Detection of Deception closed, not as a result of John Reid's death, but the school was six months in length, and could not financially-compete with the other private schools that were six to ten weeks in length. The Keeler School lasted well beyond Lenoarde Keeler's death under direction of Len Harrelson, and the Backster School is still running classes even though Cleve Backster has retired. Lynn Marcy continues to train students in Singapore even though he closed his Michigan school several years ago. Ron Decker and Dr. William Yankee were both involved in the evolution of USAMPS to DoDPI, and DACA, and now NACCA followed and the federal techniques evolved as well, and both are now deceased. The Arther School closed after the death of Richard O. Arther. Even though they would not be considered in the "pioneer group," and also had no particular training school, is the group of scientists who developed the Utah Techniques (Dr. Gordon Barland, Dr. Charles Honts, Dr. David Raskin, and Dr. Lou Rovner). There are others who are too numerous to mention who have made huge contributions to our field, and, hopefully, the new group of "pioneers" will continue to have the foresight of our original group.

CHAPTER FIVE

ACQUAINTANCE/DEMONSTRATION TESTS

The Acquaintance Test (ACQT), also known as the Demonstration Test, is a form of the known solution peak of tension test (POT) and is utilized to demonstrate the basic concepts of the polygraph examination also known as Psychophysiological Detection of Deception, or "PDD."

The primary purpose of the ACQT is to assure the examinee that the PDD process is effective for that individual. The ACQT should also reinforce the concept of differential salience for the examinee (what we used to refer to as "psychological set" or "target" – it, in basic terms, deals with the examinee's determination of the "meaningfulness" of a question). It should convince the truthful examinee that his or her polygraph examination results will be determined as non-deceptive; it should convince the lying examinee that his or her polygraph examination results will be determined as deceptive.

The ACQT is referred to as an acquaintance test since it is administered, in part, to acquaint the examinee with PDD procedures. Most agencies prefer administering "the known solution" ACQT.

During the pretest phase, the fact that an ACQT will be conducted is mentioned and all questions are reviewed prior to the test being conducted.

A meaningful introduction of the ACQT is paramount to its success. It is recommended that prior to commencement of testing, the examiner should stress the importance of "determining whether or not the examinee can physiologically respond when lying."

An examiner could introduce the ACQT by producing a chart with the intended key missing, similar to the following:

1
2
3
K E Y
5
6

Then have the examinee write in the missing number in the intended place as follows:

Figure 1

1
2
3
4
5
6

The questions utilized in the ACQT are:

- The Key representing the number written by the examinee.
- The Padding Questions, which are placed before and after the key number, and consist of questions relating to the other numbers on the test.
- The Preparatory Phrase, which is the first part of the first question of the ACQT, and is utilized to focus the examinee's attention on the issue being tested, for example:

  Regarding the number you wrote…?

- The Prefix Phrase, which is the prefix to each of the questions, for example:
  - Did you write the number...?

Preparatory Phase	Regarding the number you wrote,
Padding Question	Did you write the number 1?
Padding Question	Did you write the number 2?
Padding Question	Did you write the number 3?

Key Question	Did you write the number 4?
Padding Question	Did you write the number 5?
Padding Question	Did you write the number 6?

The ACQT is conducted in a mini-PDD format.

- It consists of a pretest interview, data collection phase, data analysis phase, and post-test interview.

- This PDD process should reassure the non-deceptive examinee and stimulate the deceptive examinee.

- A visual stimulus is utilized in the ACQT (Figure 1) to ensure the examinee knows the sequence of the questions, to include the location of the selected key.

- All questions are worded to elicit no answers.

- The ACQT is not evaluated numerically.

- Some examiners prefer a final question such as, "Did you lie to me about the number you wrote on that paper?" explaining that he or she wants to collect two "lie samples" from the examinee. Since such a question is expected to require more cognitive activity by examinee, responses to such a question are often greater.

It is evaluated utilizing the test data analysis procedures for the POT test.

References:

DoDPI. (2004). *Federal Psychophysiological Detection of Deception Examiner Handbook*. Ft. Jackson, SC: Department of Defense Polygraph Institute.

Raskin, D., & Honts, C. (2002). The Comparison Question Test. In *Handbook of Polygraph Testing* (pp. 1-48). San Diego, CA: Academic Press.

CHAPTER SIX

FEDERAL (NCCA) ZONE COMPARISON TEST (DECEPTION TEST)

Cleve Backster designed the Zone Comparison Test (ZCT), and in 1961, the United States Army Military Police School (USAMPS) adopted a variation of that format. The ZCT, as taught by NCCA (and today also known as the Federal ZCT or NCCA ZCT), has changed little from the original Backster testing format, except that it is a multi-facet test (2 primary RQs about a single-issue and a secondary RQ concerning an indirect involvement of the examinee rather than Backster's version which was strictly a single-issue test). Regardless, the ZCT technique, with various modified formats, would be the most-taught technique in the various polygraph training schools throughout the history of polygraphy and throughout the world.

During the pretest interview, all ZCT questions are reviewed with the examinee prior to the collection of charts. The following sequence is used in introducing the questions:

- Sacrifice Relevant (SR)
- Relevant (R)
- Comparison (C)
- Irrelevant (I)
- Symptomatic (Sym)

The Primary Relevant questions test for the possible direct involvement of the examinee and are R5 and R7.

Question R7 was originally an extension of, and more recently authorized as, a paraphrasing of question R5. Acceptable examples are…

R5 Did you steal that Mustang? `

R7 Did you steal that Mustang from that parking lot?

or

R7 (Alternate) - Are you the person who stole that Mustang from the Sears parking lot?

The Secondary Relevant question tests for the examinee's secondary involvement in, or guilty knowledge of, the offense under investigation and is question R10.

Under no circumstances should question R10 be a primary relevant question. Examples are…

- R10 Did you help steal that Mustang?
- R10 Do you know how that car was disposed of?

- R10 Do you know for sure who stole that Mustang?
- R10 Did you plan with anyone to steal that Mustang?

The Probable Lie Comparison (PLC or PLCQ) question is designed to be a probable lie for the examinee.

The PLC question should be similar in nature but unrelated to the specific crime or issue being tested.

These questions should be separated from the relevant issue by either time, place, or category.

The comparison questions should use the same action verb, or similar in nature action verb, as that of the relevant issue.

The comparison questions should be broad in scope and time so that they capture as many of the examinee's past life experiences as possible. An acceptable example is…

Theft issue: Before 2012, did you ever steal anything of value?

The Sacrifice Relevant Question is the first question of the ZCT format that refers to the relevant issue, and it prepares the examinee for the introduction of the relevant questions. The following is an acceptable example:

Regarding the theft of that car, do you intend to answer truthfully each question about that?

The Irrelevant Question is the first question asked during the data collection phase.

- It may also be asked in other positions on the chart.

- It is designed to allow the orienting response to habituate before a scoreable question is asked, and it can be used to allow the examinee to return to homeostasis when an artifact occurs on the chart. Irrelevant questions should be unrelated to the issue being tested.

- Irrelevant questions are not scored.

- Several irrelevant questions may be reviewed and used as needed. Acceptable examples are as follows:

  Are you now in Washington State?

  Are you sometimes called Tom?

The Symptomatic Questions are designed to test for an outside issue that could be more significant to an examinee than the relevant and comparison issues.

Symptomatic question responses are not scored during the test data analysis phase of a PDD examination.

The symptomatic questions are always questions #3 and #8 in the Federal ZCT. Acceptable examples symptomatic questions:

Symptomatic Question # 3: Do you believe I will only ask you the questions we reviewed?

Symptomatic Question # 8: Is there something else you are afraid I will ask you a question about?

With the possible exception of irrelevant questions, all questions reviewed during the pretest phase of the examination should be asked during the data collection phase.

Question #	Question Type	Question
1	Irrelevant	Are you sometimes called John?
2	Sacrifice Rel. (Gen. Focus)	Regarding that stolen money, do you intend to answer truthfully each question about that?
3	Symptomatic	Do you believe I will only ask you the questions we reviewed?
4	Comparison	Prior to 2012, did you ever steal anything from an employer?
5	Relevant	Did you steal any of that money?
6	Comparison	Prior to coming to Washington State, did you ever steal anything from anyone?
7	Relevant	Did you steal any of that money from that store?
8	Symptomatic	Is there something else you are afraid I will ask you a question about?
9	Comparison	Prior to 2012, did you ever justify a theft because you felt that you needed whatever was stolen more than the owner did?
10	Relevant	Do you know where any of that stolen money is now?

After the first chart, the comparison questions may be rotated.

The comparison question exhibiting the greatest physiological response should be placed adjacent to the relevant question exhibiting the greatest physiological response.

The rotation of the comparison questions may be made on all subsequent charts. Relevant Questions may not be rotated in the NCCA ZCT.

In most instances, the collection of three charts is appropriate beyond the Acquaintance Test. A fourth chart is allowed only if an artifact occurred (on one of the three charts), which precluded a conclusive opinion from being rendered, or additional data was needed because the examinee was not a strong responder. The numerical total required for a conclusive opinion remains the same as for a three-chart or four-chart series.

If after three charts a conclusive opinion can be rendered from those components not affected by artifacts, then the test is complete.

The ACQT should be collected as the first chart of this examination. It is conducted, in part, to acquaint the examinee with PDD procedures. The known solution ACQT is recommended by the AAPP.

The AAPP recommends a "blind" numerical analysis of the collected test data by another qualified examiner.

There are three numerical evaluation procedures recognized by the AAPP. (NCCA, Utah, ESS).

The three-position scale is used to teach the basic student of polygraph the principles of test data analysis.

- 1	0	+ 1

Most federal and police agencies use the seven-position scale.

- 3	- 2	- 1	0	+ 1	+ 2	+ 3

Individual relevant questions are grouped together and referred to as spots. Each chart has three spots (i.e., each relevant question). The examiner monitors and evaluates the examinee's response in these spots. The three spots of the ZCT are located and evaluated as follows:

SPOT I (R5) - Questions in positions C - 4 & C - 6 are compared to R - 5.

1	2	3	4	5	6	7	8	9	10
I	SR	SYM	C	R	C	R	SYM	C	R

SPOT II (R7) - Question in position C - 6 is compared to R - 7.

1	2	3	4	5	6	7	8	9	10
I	SR	SYM	C	R	C	R	SYM	C	R

SPOT III (R10) - Question in position C - 9 is compared to R - 10.

1	2	3	4	5	6	7	8	9	10
I	SR	SYM	C	R	C	R	SYM	C	R

When comparing relevant and comparison questions, each component tracing should be reviewed and compared independently.

The greatest physiological response (component by component) of the comparison question(s) should be compared to the adjacent relevant question.

Please note that the foregoing contradicts what Cleve Backster currently teaches.

These guidelines are not for Backster Examinations!

These guidelines are for the NCCA version of the ZCT.

To reach an opinion that the examinee is deceptive on the ZCT, the score must be minus three (- 3) or less (- 4, - 5, - 6, - 7, etc) in any overall vertical spot (spot total) or a grand horizontal total of minus six (- 6) or less when all spots are summed.

This is a DI Test:

Chart #	Spot # 1 Total Question 5	Spot # 2 Total Question 7	Spot # 3 Total Question 10	Chart Total
1	+1 (spot score)	-1	0	Chart 1 total 0
2	+1 (spot score)	-2	-1	Chart 2 total -2
3	-2 (spot score)	-3	0	Chart 3 total -5
Total	0 (spot total)	-6	-1	Grand Total -7

To reach an opinion that the examinee is not deceptive (NDI), each spot total (e.g., the sum total of each individual spot) must be a positive score, and the grand total of all spots must be plus six (+6) or more.

This is an NDI Test:

Chart #	Spot # 1 Total Question 5	Spot # 2 Total Question 7	Spot # 3 Total Question 10	Chart Total
1	+1	+1	0	Chart 1 total +2
2	+1	+2	+1	Chart 2 total +4
3	+2	+3	0	Chart 3 total +5
Total	+4	+6	+1	Grand Total +11

If it is not DI or NDI, it is NO.

This is a No Opinion Test

Chart #	Spot # 1 Total Question 5	Spot # 2 Total Question 7	Spot # 3 Total Question 10	Chart Total
1	+1	0	0	Chart 1 total +1
2	+1	0	+1	Chart 2 total +2
3	+2	0	+1	Chart 3 total +3
Total	+4	0	+2	Grand Total +6

Spot #2 with a total of 0, renders this test a No Opinion test and will require additional testing to resolve the issue.

NOTE: The above are the “traditional” or “investigative” scoring rules. These cut-offs do not apply to “Evidentiary” Scoring Rules discussed later.

NCCA "You Phase" Zone Comparison Format (Deception Test)

A variation of the Federal Zone of Comparison Test is a true, single-issue test with two (primary-issue) spots rather than three (two primary-issues and one secondary-issue). This test is very similar to the Backster "You Phase" ZCT format, which will be covered in a later chapter, The Federal (You-Phase or "Bi-Zone") format is as follows:

Question #	Question Type	Question
1	Irrelevant	Are you sometimes called John?
2	Sacrifice Rel. (Narrow Focus)	Regarding whether or not you stole any of that money, do you intend to answer truthfully each question about that?
3	Symptomatic	Do you believe I will only ask you the questions we reviewed?
4	Comparison	Prior to 2012, did you ever cheat anyone out of anything?
5	Relevant	Did you steal any of that money?
6	Comparison	Prior to coming to Washington State, did you ever steal anything?
7	Relevant	Did you steal any of that money from that store?
8	Comparison	Prior to 1998, did you ever steal anything from an employer?
9	Symptomatic	Is there something else you are afraid I will ask you a question about?

Scoring of the NCCA (or Federal) "You Phase" is similar to the above explained Federal ZCT; however, there are some differences. The "cutting scores" are as follows:

1. NDI: Both spot totals must be greater than 0, and the grand total of both spots must be +4 or greater.

2. DI: A total score of -3 or less in either spot, or a grand total of -4 or less for both spots.

3. NO: All other scores.

NOTE: APL's PolyScore requires four charts to render a valid decision on the You-Phase.

Comparison Questions may be rotated as in the Federal ZCT. Relevant questions may not be rotated in the NCCA version of the "You Phase" ZCT.

Any examiner seeking additional information on this (or any other) format may contact any member of the AAPP Board of Directors or the QC Director.

References:

Barland, G., Honts, C., & Barger, S. (1990). *The Detection of Deception for Multiple Issues* (DoDPI90-R-0002 and DoDPI89-P-0005). Fort McClellan, AL: Department of Defense Polygraph Institute.

Bersh, P. J. (1969). A validation study of polygraph examiner judgments. Journal of Applied Psychology, 53, 399-403.

Blackwell, N. J. (1996). Polyscore: A comparison of accuracy (Rep. No. DoDPI 95-R-0001). Fort McClellan, AL: Department of Defense Polygraph Institute.

DoDPI. (2004). *Federal Psychophysiological Detection of Deception Examiner Handbook*. Ft Jackson, SC: Department of Defense Polygraph Institute.

Harris, J., McQuarrie, A., & Olsen, D. (2004). Polyscore (Version 5.5c) [Computer software]. Laurel, MD: The John Hopkins University Applied Physics Laboratory.

Janniro, M. J. (1993). Effects of computer-based instruction on student learning of psychophysiological detection of deception test question formulation. Journal of Computer-Based Instruction, 20 (2, Spring), 58-62.

Shull, K. W. & Crowe, M. (1993). Effects of two methods of comparing relevant and control questions on the accuracy of psychophysiological detection of deception (Rep. No. DoDPI 93-R-0002). Fort McClellan, AL: Department of Defense Polygraph Institute.

CHAPTER SEVEN

MODIFIED GENERAL QUESTIONS TESTS (DECEPTION TEST)

DoDPI introduced the Comparison Test Format (CTF) in 1997. The term CTF is an umbrella term which addresses variations of the modified general question test (MGQT).

Although the Federal (multi-facet) Zone Comparison Test (ZCT) is also a CTF, it was discussed separately since the research and the psychophysiological detection of deception (PDD) communities treat and address multi-facet and single-issue tests differently.

The variations of the MGQT question formats addressed in this document have been validated through research and/or have been taught at USAMPS, DoDPI, DACA, or NCCA. These formats are among those utilized for personnel screening, source validation and criminal specific PDD testing.

During the pretest interview, all questions are reviewed with the examinee prior to the collection of charts. The following sequence should be used in introducing questions:

Sacrifice Relevant (some variations use this question)
Relevant
Comparison
Irrelevant

The Primary Relevant Question (PRQ) tests for the possible direct involvement of the examinee. An example is…

> Did you steal that car from that parking lot?

The Secondary Relevant Question (SRQ) tests for the examinee's possible indirect involvement in the offense under investigation.

A secondary relevant question should be constructed to (1) address a secondary issue such as helping, planning, or participating; or (2) test for secondary involvement in, such as seeing, hearing, or knowing; or (3) focus on the nature or location of evidence and/or physical acts that support the primary offense.

In the CTF, there are three types of secondary relevant questions:

The Evidence Connecting Question (EC) is designed to determine if the examinee was involved with any of the evidence of the crime, or if he or she is aware of the nature or location of various items of evidence. An acceptable example is…

> Do you know where any of that money is now?

The Guilty Knowledge Question (K) is used to determine if the examinee has any knowledge of who committed the incident under investigation. Acceptable examples are…
Do you know for sure who shot that man?
Do you know who stole any of that money?

The Secondary Involvement Question (SI) tests for secondary involvement such as seeing or hearing, or it focuses on physical acts that support the primary offense. An acceptable example is…

Did you participate in the theft of any of that money?

If specific Guilty Knowledge or Evidence-Connecting questions cannot be developed from the available facts, it is permissible to use any indirect or secondary involvement questions as long as they do not deal with a separate crime issue than that being questioned in the Primary RQs.

A Probable Lie Comparison (PLC) Question is designed to be a probable lie for the examinee.

The PLC question should be similar in nature but unrelated to the specific crime or issue(s) being tested.

The question should be separated from the relevant issue by time, place or category. The comparison question should use the same action verb or similar in nature action verb as that of the relevant issue.

A comparison question should be broad in scope and time so that it captures as many of the examinee's past life experiences as possible. An acceptable example is…

Before 1998, did you ever steal anything of value?

A Directed Lie Comparison (DLC) Question is a specialized comparison question – it should never be used by any Examiner unless he/she has had formal training in its use.

A properly constructed DLC question involves a minor transgression which should have some personal significance to the examinee.

Upon acknowledging having committed such a transgression, the examinee is directed to lie when asked that question on the test.

The DLC question is separated from the relevant issue by category. The DLC question, in the CTF context, may be used in counterintelligence matters. Scientific research supports using the DLC question in screening and diagnostic contexts. It is inappropriate to utilize DLC and PLC questions in the same test. The AAPP recommends using either DLCs or PLCs in an examination until additional scientific evidence becomes available. An example of a DLC question is…

Did you ever lie to a coworker about anything?

NOTE: Research has shown that the DLCQ produces excellent responses from the cardiosphygmograph and the galvanograph tracings but has a different effect (than seen with PLCQs) on the pneumograph tracing and should be used with caution and only by those with proper training in its use.

A Sacrifice Relevant Question, when utilized, (and some agencies / departments use this question) is the first question that refers to the relevant issue, and it prepares the examinee for the introduction of the relevant questions. An acceptable example is…
Regarding the theft of that car, do you intend to answer truthfully each question about that?

An Irrelevant / Neutral Question is the first question asked during the data collection phase.

Irrelevant questions may also be asked in other positions on the chart.

Irrelevant questions are designed to allow the orienting response to habituate before a scorable question is asked, and can be used to establish homeostasis when an artifact occurs on the chart.

Irrelevant questions should be unrelated to the issue being tested. Irrelevant questions are not scored during the analysis phase.

Several irrelevant questions may be reviewed and used as needed. Acceptable examples are…

Are you now in Washington State?

Are you sometimes called Tom?

With the possible exception of irrelevant questions, all questions reviewed during the pretest phase of the examinations should be asked during the data collection phase.

The exact sequence in which the questions are to be asked in the data collection phase should not be revealed to the examinee.

The test format should begin with an irrelevant question.

Irrelevant questions may be inserted into each chart as needed.

A sacrifice relevant question may be included in the test format.

Two to five relevant and two to four comparison questions may be utilized.

If a single relevant question test is required, then the You Phase ZCT should be utilized.

After the first chart, comparison questions may be rotated or a mixed series may be utilized.

At least one of the subsequent charts must contain a mixed series.

After the first chart, subsequent charts should be constructed so that the relevant question displaying the greatest physiological responses is adjacent to the comparison question(s) with the greatest physiological responses.

Each relevant question should be bracketed by comparison questions in at least one chart of each series.

In all instances, three presentations of each relevant question are required by best practices.

An additional presentation of all questions, i.e., a fourth chart, is only authorized if an artifact occurred that precluded a conclusive opinion from being rendered, or the examinee is an emotionally-low responder. If, after three presentations, a conclusive opinion can be rendered from those components not affected by artifacts, the test is complete.

The numerical total required for a conclusive opinion when four charts are conducted remains the same as for a three-chart series.

Under no circumstance is a fifth chart acceptable.

United States Army Version Question Format

1	2	3	4	5	6	7	8	9	10
I	I	SRQ (K)	I	PRQ	C	I	SRQ (EC)	SRQ (SI)	C

THE ARMY VERSION OF THE MGQT FORMAT HAS BEEN PROVEN TO BE SEVERELY DEFICIENT IN VALIDITY AND RELIABILITY AND SHOULD NEVER BE USED FOR ANY PURPOSE IN POLYGRAPHY.

There are other variations of the NCCA- taught MGQT / CTF that are in use and are constructed as indicated:

United States Secret Service Version Question Format

I	SR	C	R	PRQ	C	R	R	C

During the second chart comparison questions may be rotated or a mixed series may be utilized.

During the third chart a mixed series may also be utilized, i.e., the RQs and CQs are rotated.

United States Navy Criminal Investigation Service Version Question Format

I	SR	C	R	I	PRQ	C	R	I	R	C

During the second chart, comparison questions may be rotated.

When rotating, place the comparison question exhibiting the greatest physiological responses adjacent to the relevant question exhibiting the greatest physiological response. Both CQs and RQs may be rotated in a mixed-series.

During the third chart, a mixed series is utilized. Again, the RQ exhibiting the greatest response should be paired with the CQ exhibiting the greatest response.

United States Air Force OSI Version Four Question Format

I	SR	C	R	C	PRQ	C	R	C	R

During the second chart comparison questions may be rotated or a mixed series may be utilized.

During the third chart a mixed series may also be utilized.

The Air Force OSI also utilizes a three-question and two-question format. The same administration and data analysis rules also apply to these formats.

United States Air Force OSI Three Question Format

I	SR	C	R	C	PRQ	C	R

United States Air Force OSI Two Question Format

I	SR	C	R	C	PRQ	C

References:

Barland, G. H., Hotness, C. R., & Barger, S.D. (1990). The Detection of Deception for Multiple Issues. Project No. DoDPI89-P-0005.

J. A. Podlesny and C. M. Truslow (1993). Validity of an Expanded-Issue (Modified General Question) Polygraph Technique in a Simulated Distribution-Crime- Roles Context. Journal of Applied Psychology Vol.78, No.5, 788-797.

The USSS and NCIS tests have been validated by the following research projects:

Raskin, D. C., Kircher, J. C., Honts, C. R. & Horowitz, S. W. (1988). A Study of the Validity of Polygraph Examinations in Criminal Investigation Salt Lake City, Utah Final Report to the National Institute of Justice Grant No.85-IJ-CX-0040 Department of Psychology University of Utah.

Davidson, W. A. (1 979).Validity and Reliability of the Cardio Activity Monitor Polygraph Vol.8, No.2 104-111.

Other MGQT variations.

Several years ago, then-DACA disposed of the various federal variations of the Modified General Questions Tests and incorporated them all into the AFMGQT. The Navy and Secret Service versions were included above since many polygraphists continue to use them even though NCCA does not recognize them currently. We have included the current NCCA protocol for the AFMGQT testing techniques/formats below:

AFMGQT Structure and Operations. There are two authorized versions of the AFMGQT. It is the examiner's discretion as to which is chosen in specific-issue testing.

A. Version 1 is the original AFMGQT format that was modified from the Army MQGT in the mid 1970s. Version 1 of the AFMGQT has a two, three and four relevant question version as follows:

a. Version 1, Two Relevant Question Test:
   1. Irrelevant
   2. Sacrifice Relevant
   3. Comparison
   4. Secondary Relevant (Usually help, plan, participate, guilty knowledge or Evidence connecting)
   5. Comparison (Most encompassing)
   6. Primary Relevant (Always primary relevant position)
   7. Comparison

b. Version 1, Three Relevant Question Test:
   1. Irrelevant
   2. Sacrifice Relevant
   3. Comparison
   4. Secondary Relevant (Usually help, plan, participate or evidence connecting)
   5. Comparison (Most encompassing)
   6. Primary Relevant (Always primary relevant position)
   7. Comparison
   8. Secondary Relevant (Guilty knowledge or evidence connecting)

c. Version 1, Four Relevant Question Test:
   1. Irrelevant
   2. Sacrifice Relevant
   3. Comparison
   4. Secondary Relevant (Usually help, plan, participate or evidence connecting)
   5. Comparison (Most encompassing)
   6. Primary Relevant (Always primary relevant position)
   7. Comparison
   8. Secondary Relevant (Typically evidence connecting)
   9. Comparison
   10. Secondary Relevant (Usually guilty knowledge or evidence connecting)

B. Version 2 is a modified version of the original AFMGQT. It was devised as an authorized testing format for counterintelligence security polygraph examinations. It was subsequently utilized in informant testing. It is now an authorized testing format for specific-issue polygraph examinations. The primary difference between versions 1 and 2 is that each relevant question in Version 2 is always bracketed by a comparison question either of which may be used in the evaluation process.

a. Version 2, Two Relevant Question Test
   1. Irrelevant
   2. Sacrifice Relevant
   3. Comparison
   4. Secondary Relevant (Usually help, plan, participate, guilty knowledge or evidence connecting)
   5. Primary Relevant (Always primary relevant position)
   6. Comparison (Most encompassing comparison)

b. Version 2, Three Relevant Question Test
   1. Irrelevant
   2. Sacrifice Relevant
   3. Comparison
   4. Secondary Relevant (Usually help, plan, participate or evidence connecting)
   5. Primary Relevant
   6. Comparison (Most encompassing)
   7. Secondary Relevant (Usually guilty knowledge or evidence connecting)
   8. Comparison

c. Version 2, Four Relevant Question AFMGQT:
   1. Irrelevant
   2. Sacrifice Relevant
   3. Comparison
   4. Secondary Relevant (Usually help, plan, participate or evidence connecting)
   5. Primary Relevant
   6. Comparison (Most encompassing)
   7. Secondary Relevant (Usually evidence connecting)
   8. Secondary Relevant (Usually guilty knowledge or evidence connecting)
   9. Comparison

C. There are always three AFMGQT charts collected. The first AFMGQT chart is collected in straight sequence. The sequence for the questions on the second chart is always changed. At the examiner's discretion, the order of the questions on the third chart may also be changed. As long as the relevant questions are bracketed by comparison questions according to the format, examiners have the option of sequencing the comparison and relevant questions in any manner they choose for charts two and three for either version of the AFMGQT. For Version 2, when using the three relevant question format, examiners may sequence the relevant questions in a one-two or two-one relevant question sequence in the mixed chart(s). For instance, chart two might be sequenced IR, SR, C, R, C, R, R, C and chart three may be sequenced IR, SR, C, R, R, C, R, C or vice versa.

D. An acquaintance test is always collected as the first chart with the AFMGQT.

E. Centering adjustments may be made at appropriate times between any questions. Sensitivity and cardiovascular pressure changes can only be made before the third question is asked on the AFMGQT (first comparison question).

F. During the data collection phase, irrelevant questions may be inserted for homeostasis purposes as needed. Additionally, although each version of the AFMGQT has just one specified irrelevant question in the format, examiners may review as many as three irrelevant questions in the pretest interview. By doing this, each chart could begin with a different irrelevant question or the examiner would have additional irrelevant questions to insert for homeostasis purposes. However, this procedure is optional.

There are other variations of the Single-Issue Comparison Test (SICT) question formats in use within the polygraph communities, some of which have been subjected to sufficient validity studies; others have not.

The AAPP Board of Directors cannot support techniques without validity and reliability studies.

The criteria for the DACA -taught MGQT, USAF, NCIS and USSS were subject to the following research/studies:

Yankee, William J., Position Statement Pertaining to Control Question Techniques, May 4,1990, Department of Defense Polygraph Institute.

Patrick, C. J., lacono W. G. (1987). Validity and Reliability of the Control Question Polygraph Test: A Scientific Investigation. Paper presented at the Society of Psychophysiological Research Meeting, Amsterdam, 1987.

Additional Reference:

Barland, G., Honts, C., & Barger, S. (1990). *The Detection of Deception for Multiple Issues* (DoDPI90-R-0002 and DoDPI89-P-0005). Fort McClellan, AL: Department of Defense Polygraph Institute.

Author Unknown (2009). *Psychophysiological Detection of Deception 505 – Air Force Modified General Questions Test* . Fort Jackson, SC: Defense Academy for Credibility Assessment.

The AAPP Board of Directors recommends whatever technique you use, you must be prepared to defend it in court. Make your decision wisely, or you may become famous (or infamous) beyond your expectations.

CHAPTER EIGHT

UTAH ZONE PROBABLE LIE COMPARISON TESTS (DECEPTION TESTS)

In 1970, Dr. David Raskin and his colleagues began researching the CQT in an effort to improve its validity. Since that time, hundreds of scientific papers on what we know today as the Utah ZCT have been written, and the "technique" has been defended numerous times in courtrooms across the country.

The Utah ZCT is not simply a set of questions strewn together to make what many might consider a "valid" question format, but rather, it is a comprehensive set of scientifically supported guiding principles of proper polygraph procedures.

There are many "versions," (e.g., different question sequences combined with assorted question types) of the Utah Test in the scientific and polygraph literature. This is because the Utah researchers have discovered over the years that proper testing principles are more important than rigid adherence to a particular question template. In short, their research has shown, in essence, that a test with at least a couple of well-formulated RQs and at least a couple of well-formulated CQs is a valid test. With that said, most of the Utah lab research was conducted on single-issue tests containing three RQs and three CQs. IN ANY EVENT, the AAPP strongly suggests examiners utilize only those test formats (and any necessary and justifiable deviations) that are published in the relevant scientific and/or polygraph literature. The AAPP will not defend testing techniques that do not have empirical support. Several of those published (and "validated") formats are presented below.

Some of the following is redundant (e.g., included in other sections of this handbook), and some is contradictory to what is taught in other scoring systems and techniques (and also outlined in this handbook). It is intentionally included here in order to avoid any ambiguity in how to properly conduct any of the Utah tests.

PRE-TEST PROCEDURES:

The Utah test begins with a standardized pre-test. It is a very low-key, professional discussion between the examiner and the examinee. It begins with the examiner obtaining the basic biographical information from the subject along with a discussion of any medical or psychological conditions that would render the subject unsuitable for the exam. As the examiner collects the necessary information, he/she consciously attempts to establish a rapport with the examinee.

Next, the examiner discusses the allegations or issue(s) to be tested. The examinee is encouraged to speak freely about his/her version of events. Never (during the pre-test or in-test phase) is the subject's version of events questioned, and never should the examiner do or say anything that might lead the subject to believe the examiner is anything but neutral in his/her approach. The examiner must be viewed as a completely unbiased professional in whom the subject can place his/her trust, thereby reducing the subject's level of general anxiety.

Following the above discussion, the examiner gives the subject a general explanation of the psychophysiological rationale for the exam, connects the instrument, and conducts a known-solution numbers (demonstration) test. (The examinee is told to pick a number between two and six, tell the examiner the number, and then answer "No" when asked if he/she chose that number during the test, which includes the numbers one to seven.) The demonstration test differs slightly when employing directed-lies in that the examinee is also told he/she must respond "appropriately" when lying or else he/she will not be a suitable candidate for the exam. What is "appropriate" is not explained to the examinee.

At the conclusion of the demonstration test, the examinee is told he/she responded greatest to the chosen (and lied about) number – regardless of whether that was the case. He/she is then told the examiner now has a sample of the subject's physiological responses when lying and when truthful. The examinee is also told his/her responses will be even greater if he/she lies on the test as those questions will be much more serious issues.

The relevant questions, beginning with the sacrifice relevant, are then developed and discussed with the examinee, taking time to make sure they are not in any way ambiguous.

The comparison questions are then developed. The Utah test uses EITHER probable-lie OR directed-lie comparison questions. (There is very limited research on using both in a single test. Until there is a sufficient body of research to support their combined use, the AAPP BOD takes the position that doing so is NOT appropriate.)

PROBABLE-LIE COMPARISON QUESTIONS:

Probable-lie comparison questions deal with acts that are similar to the issue under investigation; however, they are much more general in nature and are deliberately vague, unlike the relevant questions. They are designed to be in all probability, lies if answered in the negative, and the examinee is encouraged, through negative interview techniques discouraging more than a minor admission or two, to answer in the negative. At a minimum, the examinee should be at least somewhat uncertain of his/her truthfulness to the comparison questions.

The probable-lie questions are introduced in such a way as to make the examinee believe lying to them will result in large physiological responses that will be interpreted by the examiner as indications that he/she is guilty of the relevant issue.

The phrase "similar to the issue under investigation" does not mean, for example, that in a theft case, all CQs will involve acts of theft. Rather, the CQs must be viewed by the examinee as reasonably related to the issue at hand. They may be introduced as "character" or "profile" questions, or they may be introduced in any fashion that can be reasonably and rationally justified to the examinee as necessary to devising a successful exam, emphasizing that deception to the comparison questions will result in the examiner concluding the examinee is guilty of the relevant issue. Moreover, the method employed to introduce the comparison questions should lead the examinee to believe that an affirmative answer or admission will lead the examiner to form the opinion that the subject is the type of person who would engage in behavior typical of one who engages in the relevant issue and therefore is likely be guilty of the crime in question.

For example, the examinee might be told in a sex assault case that the relevant issue is one involving the potential to hurt a person; therefore, the examiner has to ask a question regarding how the examinee treats people in general. The examinee would then be presented with a question such as, "Before your 28th birthday, did you ever hurt anybody?" Hurting need not be limited to the physical, but emotional and financial as well. Other similar issues in most any case would involve dishonesty, committing illegal acts, lying, etc.

Note that the Utah test would avoid restrictive phrases that would limit the vagueness of the probable-lie comparison questions. Continuing with the above example, the question, "Before your 28th birthday, did you ever hurt anybody <u>who loved and trusted you</u>?" would be avoided as it limits the impact of the question and reduces the probability (albeit rather modestly in this example) that it is a lie. (Pre-tested correctly, the phrase "loved and trusted you" *could* conceivably create more ambiguity and uncertainty, but it still needlessly narrows the issue. Moreover, the phrase could be used as one part of the examiner's explanation of what the question means as CQs should receive as much time and explanation as the RQs do.)

The Utah test employs CQs designed to exclude the relevant issue. How that is done is essentially a matter of personal choice. The traditional "Prior to…," "Before…," "Between your _____ and _____ birthdays…," etc., are common. Additionally, what are often referred to as Marcy or Canadian Police College type barring phrases (e.g., "Not connected with this case…," or "Unrelated to this issue…") are also acceptable. (These barring phrases are particularly useful for older cases in which a significant amount of time has passed between the alleged act and the polygraph examination.) The goal, as previously stated, is to use a barring phrase that separates the RQs from the CQs.

If the examinee makes admissions to any comparison questions, the examiner responds in such a fashion as to prevent further admissions, and then rephrases the question, adding, "Other than what you told me and [barring phrase]…?"

<u>DIRECTED-LIE COMPARISON QUESTIONS:</u>

Drs. Raskin and Honts explain the appropriate way of introducing directed-lie comparison questions in their chapter in Murray Kleiner's Handbook of Polygraph Testing. Their introduction reads as follows:

> "On this test I need to ask you some questions to which I want you to lie. Just as on the number test, I need to have questions to which you and I both know you are lying and some that you and I know you are answering truthfully. That way, I can see the difference in your reactions when you lie and when you tell the truth, and I will be able to see if your reactions on the questions about the [relevant issue(s)] are the same or different compared to the questions I know you answered with a lie. Therefore, I am going to ask you, "During the first 27 years of your life, did you ever tell even one lie?" I want you to lie to that question. Also, I want you to have that in mind when you answer this question on the test. Do you have a particular instance in mind? …All right, I do not want you to tell me what it is. When I ask

> you that question on the test, I want you to lie by answering "No." When you answer, I want you to think about the time when you lied. That way, you and I will be sure you are lying when you answer that question on the test, and I can make sure that you act appropriately and that you continue to be a suitable subject."

Directed-lie comparison questions should involve personal transgressions common to all – not trivial lies such as lying about what day it is or denying a particular state is in the United States as research has shown such questions result in less significant reactions, thereby increasing the chances of a false positive.

As with probable-lie comparison questions, it is assumed the innocent will react more strongly to the directed-lie comparison questions as doing so is necessary for them to demonstrate that they are suitable subjects for the test and that their lying reactions continue to be different from the relevant questions to which they are being truthful. (In other words, the innocent are more concerned that their reactions to the directed-lies are more significant than those to the relevant questions to which they are telling the truth. If they have no concern about the directed-lies, then their reactions to both questions types, they believe, would be identical, resulting in a DI call.)

The guilty, on the other hand, are presumed to be more concerned about the relevant questions for two reasons: They believe the number test showed what a "deceptive reaction" looks like, and they have no desire to cooperate and attempt to continue to show what their deceptive responses look like, i.e., they do not want the CQs and RQs to look the same as they believe that would result in a DI call. In any event, as with probable-lie comparison question tests, it is difficult, and likely impossible, for a suitable subject to fail to significantly respond to the relevant questions (to which he is lying).

There are fewer validity studies on the directed-lie CQT, but those studies have shown them to be about as accurate as probable-lie CQTs.

After developing the comparison questions, the examiner introduces the Neutral questions. This is done simply by introducing them as known truth questions to which the examinee should have no difficulty answering truthfully. They should be simple, straightforward and non-emotion provoking, e.g., "Is today Friday?"

In the most recently published versions of the Utah ZCT only one other question type is utilized: the introductory question. It, like the sacrifice relevant, serves as buffer used at the beginning of the test, and like the sacrifice relevant question, is not scored.

The introductory question is introduced by telling the examinee the examiner needs to ask one more question so that he knows the examinee understands there will not be any questions on the exam they have not discussed. It simply asks, "Do you understand that I will ask only the questions we have discussed?" It is not an "outside issue" or "symptomatic" question. That is, it does not ask if the examinee "fears" the presentation of an unreviewed question as doing so could introduce such a fear. Moreover, some research has shown that symptomatic questions do not do what they were intended to do. In one study by Drs. Honts, Amato and Gordon, symptomatic questions did not affect the deceptive examinees' scores, but they did lower the scores of the

truthful. Additionally, the study found examiners were not able to detect the presence of outside issues at greater than chance rates.

IN-TEST PRACTICES:

The examiner's attitude remains professional and objective throughout the in-test phase.

Standard instructions regarding unnecessary movements, coughing, etc., are given to the examinee. The examiner explains the only talking that takes place during the exam is his questions and the examinee's "Yes" or "No" answers. The examinee is also informed that if he happens to think of anything during the exam, he should mention it immediately following – not during the test chart.

The test questions are presented at least three times, i.e., three charts are run, rotating the neutral, comparison, and perhaps the relevant questions from chart to chart in order to prevent anticipatory reactions, and questions are paced 25 to 35 seconds apart.

Up to five charts can be run if a conclusion cannot be rendered after three. See scoring section (below) for additional details.

PLCQ Tests:
At the beginning of the test, the examiner reminds the examinee to answer all questions truthfully.

After each chart the examiner asks if the examinee has any concerns or problems that need to be addressed (or he addresses those brought up by the examinee). Questions are then adjusted if necessary.

In order to make sure the RQs are clear and straightforward and that the CQs remain salient, each is reviewed with the examinee between each chart as doing so decreases the chances of error (even if limited to the CQs). IN NO EVENT should the examinee be told how he "is doing," nor should he be told of any reaction or lack of reaction to any questions as doing so could render the test invalid.

DLCQ Tests:
At the beginning of the test and prior to each subsequent chart, the examiner reminds the examinee to answer all questions truthfully with the exception of the DLCQs, to which the examinee is instructed to lie. Additionally, he/she is reminded to think back (as he/she answers) to the particular incident in which he/she committed the act that makes his/her answer a lie. (He/she is reminded to do that for each of the DLCQs.) After each chart, the examiner asks if the examinee is aware that his/her answers were in fact lies. He/she also deals with any problems or concerns the examinee discloses.

UTAH TEST SCORING RULES AND CRITERIA:

NOTE: The Utah scoring rules and criteria were developed through extensive scientific research, and they can be used to score any CQT.

Relevant questions are scored against the immediately preceding comparison question, unless the RQ is bracketed by CQs, in which case the RQ is scored, channel by channel, against the strongest adjacent CQ reaction. For example, in the question sequence C1 R1 C2, if C1's EDA physiological response is the greater than C2's, then C1's EDA response is compared against R1's EDA response. Then, if C2's cardio response is greater than C1's, C2's cardio response is compared to R1's cardio response.

In tests in which two RQs are bracketed by two CQs (i.e., CQ1 RQ1 RQ2 CQ2), the RQs are scored in the same fashion (i.e., against the strongest of the two CQs, channel by channel as explained above).

Scoring is the same for DLCQ and PLCQ tests.

Scoring begins with a look at the general, overall purity and stability of the physiological tracings on each chart.

Scoring always begins with the breathing tracings, as any abnormalities reflected in those tracings could alter the other tracings.

SCORING CUT-OFFS:

Single-Issue:

The cut-offs for a single-issue test (one in which all the RQs must be answered either truthfully or deceptively) are +/- 6. The charts are scored after three charts. If a decision can be made, then the exam is complete. If inconclusive, then two more charts are run and scored. The total score (of all five charts) is the final score, and a decision of DI, NDI or NO is then made. Spot scores are not considered.

Multiple-Facet

The cut-offs for a multiple-facet test are +/-3 per spot after three charts. A decision of truth or deception is rendered for each question based on the spot-total of the particular question. Additionally, if the grand total score is +/-6 and all spot totals are either positive or negative, then the call for all questions is NDI or DI, respectively.

The UTAH test uses the following scoring criteria:

Positive scores are assigned if the CQ is greater than the RQ to which it is compared, and negative scores are assigned if the reverse is true.

Seven-Point Scale:
0 = no difference (or less than required ratio)
+/-1 = noticeable difference
+/-2 = strong, clear difference
+/-3 = dramatic difference and the tracing is stable and the stronger response is the largest on the chart for that physiological measure

NOTE: A score of +/-3 in *any* channel is rare.

Scoring Windows:
The response must begin after the question onset (immediately for cardio and breathing; 0.5 seconds for EDA; two to four seconds for plethysmograph) and within five seconds of the answer, unless the subject typically doesn't react until five to eight seconds after answering. An otherwise timely reaction may be considered up to 20 seconds following the onset of the question.

Breathing:
At least two successive cycles of apnea, suppression, baseline arousal and/or *slowing of rate* (*less heavily weighted*); both channels are considered, but the final (single) score is based on either the abdominal or thoracic channel, or a composite of the two channels.

NOTE: Scores of 0 and +/-1 are most common; other scores are rare.

EDA:
Amplitude (2:1 = +/- 1; 3:1 = +/- 2; 4:1 = +/- 3)
Duration and complexity are considered (A clearly longer duration or greater complexity may increase the score from 0 to 1 or 1 to 2, but the amplitudes must be at least 1.5:1 and 2.5:1, respectively.)

NOTE: The EDA channel is considered unstable when many non-specific responses are observed throughout the chart.

Cardiovascular:
Amplitude (1.5:1 minimum) *Duration and complexity* are considered (A clearly longer duration or greater complexity may increase the score from 0 to 1 or 1 to 2.)

NOTE: Scores of 0 and +/-1 are most common.

Finger Plethysmograph:
Amplitude reduction and / or *Duration* (no minimum required, but +/-2 maximum score allowed)

NOTE: a score of 1 or 2 may be assigned when duration is clearly longer even if there is little or no difference in amplitude reduction of the questions being compared.

Artifacts:

Any artifact may render a channel or an entire question non-scorable. If a comparison question is not useable for scoring, then use the strongest, closest-in-time comparison question. Additionally, follow these guidelines for analyzing questions that include deep breaths or movements:

Deep Breaths:

If the examinee takes a deep breath just before question onset, then breathing should not be scored.

If a deep breath affects other channels, then those channels *might* be used for scoring: If the other channel's reaction started *before* the deep breath, then the portion (of the other channel's reaction) occurring before the deep breath may be used for scoring if that portion is larger than the reaction to which it is being compared. If the portion is smaller and is a comparison question, then another comparison question may be used.

If there are deep breaths elsewhere in the charts, especially where no questions were asked, and those deep breaths resulted in similar physiological changes (as the deep breath in question), then the reaction following the deep breath should not be scored. If there is no reaction following the deep breath, score very conservatively.

Movements:

If a movement distorts more than two successive (cardio) pulses after question onset, then the changes occurring after the movement should not be scored. The reaction preceding the movement artifact, if any, may be used for scoring purposes if the reaction is larger than the cardio reaction to which it is being compared. If only one or two pulses are distorted, then estimate what the reaction would have looked like had the movement not occurred, if possible.

TEST STRUCTURES:

In 1980 Richard Weaver published one version of the Utah Test, which is listed below:

Test Question Position:	1	2	3	4	5	6	7	8	9	10
Question Type:	(I)	(S/R)	(SY)	(C)	(R)	(C)	(R)	(I)	(C)	(R)

James Matte published two versions of the Utah Test in his text, referring to one as the "Bartlett Version" and the other as the "Honts Version." Technically, all of the tests are properly called "Utah Tests," but the labels are maintained here for the sake of consistency and to avoid confusion.

"Bartlett" Version:		"Honts" Version:	
(Y)	1. Irrelevant	(Y)	1. Irrelevant
(YR)	2. Sacrifice Relevant	(YR)	2. Sacrifice Relevant
(B)	3. Symptomatic	(Y)	3. Irrelevant
(G)	4. Comparison Question	(G)	4. Comparison Question
(R)	5. Relevant	(R)	5. Relevant
(G)	6. Comparison Question	(Y)	6. Irrelevant
(R)	7. Relevant	(G)	7. Comparison Question
(Y)	8. Irrelevant	(R)	8. Relevant
(G)	9. Comparison Question	(Y)	9. Irrelevant
(R)	10. Relevant	(G)	10. Comparison Question
	11. Relevant		

The most recently published (typical) versions of the Utah Test are as follows:

(TYPICAL) UTAH SINGLE-ISSUE TEST (Using probable-lies as examples*)

I: Do you understand that I will ask only the questions we reviewed?

SR: Regarding whether you stole any part of that missing money, do you intend to answer all of the questions truthfully?

N1: Do you live in the US?

C1: During the first 31 years of your life, did you ever take anything that did not belong to you?

R1: Did you steal any part of that missing money?

N2: Is today Monday?

C2: Before 2006 and other than what you told me, did you ever tell a serious lie?

R2: Did you steal any part of Joe's missing money?

N3: Are you now in the State of California?

C3: Prior to meeting Joe, did you ever do anything dishonest or illegal?

R3: Did you steal any part of that missing money last week?

*NOTE: Probable-lies are used for illustration purposes only. EITHER directed-lies OR probable-lies can be used in ANY version of the Utah test.

This test format can also be used for multi-facet tests.

The benefit of the above test structure is that NQs always follow RQs in order to avoid compensatory responses from the RQs interfering with the potential reactions in the CQ's.

(TYPICAL) UTAH MULTI-FACET TEST (Using directed-lies as examples)*

I: Do you understand that I will ask only the questions we reviewed?

SR: Regarding whether you stole any part of that missing money, do you intend to answer all of the questions truthfully?

N1: Do you live in the US?

C1: During the first 31 years of your life, did you ever tell even one lie?

R1: Did you steal any part of that missing money

R2: Did you in any way participate in stealing any part of that missing money?

C2: Prior to 2006, did you ever violate a personal confidence or betray a trust?

R3: Did you dispose of any of that missing money?

R4: Did you take any of that missing money from Bill's desk draw?

C3 Before age 32, did you ever break even one rule or regulation?

N2 Are you now in Virginia?

*Any Utah test may utilize EITHER DLCQs or PLCQs.

R4 may be eliminated for simple issues, if necessary.

This format is flexible enough to be used for single-issue tests if desired.

Research has indicated that for multi-facet tests in which the subject is truthful to some relevant questions but deceptive to others, the accuracy of all decisions decreases, and in particular, false positive errors increase.

References:

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Additionally, the AAPP would like to acknowledge and thank Dr. David Raskin and Dr. Charles Honts for their guidance and willingness to respond to the questions that arose while writing this chapter.

CHAPTER NINE

MICELLANEOUS TECHNIQUES/FORMATS (DECEPTION TESTS)

The following techniques and formats presented are those in which at least one specific validity and reliability study has been done to support the accuracy and usefulness of the technique; however, at the time of this document being printed there are some which have had the required, two, separate, independent studies done to support cross-validation. In the case of the Backster "You Phase" ZCT, a single-issue test format, numerous studies have been conducted that support the validity and reliability of this technique. The other Backster formats have not been validated by specific validity and reliability studies. The Canadian Police College ZCT ("A" Series) has met the AAPP standards; however, the Canadian Police College ZCT ("B" Series) has not met the AAPP standards. The Reid Technique has also met such standards. The Arther Specific Accusation Technique, the Gordon Integrated Zone Comparison Technique/Formats, the various Marcy Technique/Formats, the Matte Quadri-Track ZCT, and the Relevant-Irrelevant and Modified Relevant-Irrelevant Specific-Issue tests have not met the AAPP Board recognition standards.

Again, use of any of the above-listed polygraph techniques/formats, even if not recognized by the AAPP Board, does not prevent use and does not mean violation of any AAPP rules, ethics, or standards of practice by doing so. It just means that one has to be prepared to defend whatever technique was used; whether or not it is on the recommended list.

USE OF ANY OF THE FOLLOWING TECHNIQUES BY EXAMINERS WITHOUT THE PROPER AND FORMAL TRAINING IN THESE TECHNIQUES WOULD CONSTITUTE ETHICAL VIOLATIONS AND/OR INVALID EXAMINATIONS. ETHICAL VIOLATIONS WOULD ALSO OCCUR IF QUALITY CONTROL REVIEWS ARE DONE WITHOUT THE PROPER AND FORMAL TRAINING IN THE TECHNIQUE.

BACKSTER ZONE COMPARISON TEST

"YOU PHASE" - 2 SPOT (Scored With Horizontal Total – Overall Score)

Q#	Q Type	Score As
1. (13)	Irrelevant/Norm Question (Yellow Zone)	Neutral
2. (25)	Symptomatic Question (Black Zone)*	Not Scored**
3. (39)	Sacrifice Relevant Question (Yellow-Red Zone)	Not Scored
4. (46)	Comparison Question (NCEC) *** (Green Zone)	Control
5. (33)	Strong Relevant Question (Red Zone)	Relevant
6. (47)	Comparison Question (NCEC) *** (Green Zone)	Control

7. (35)	Strong Relevant Question	(Re-Worded) (Red Zone)	Relevant
8. (48)	Comparison Question (NCEC) ***	(Green Zone)	Control
9. (26)	Symptomatic Question****	(Black Zone)	Not Scored**

* E.g., "Are you completely convinced I will not ask a question we have not reviewed?"
**If significant psychophysiological responses occur on these questions, particularly if they are larger and/or consistently present when compared to RQ and CQ, Backster teaches that there is the possibility of the presence of an issue that is external to the issue being tested. That issue is causing "dampened" or erratic responses on the RQs and/or CQs, which will affect the test data analysis rendering a final call of truth or deception inappropriate.

*** NCEC means a "non-current exclusive comparison question," e.g., "Between the ages of [pre-dating the relevant issue, thereby making it "non-current" so to exclude the relevant issue]…?"

**** E.g., "Is there something else you are afraid I will ask you a question about even though I told you I would not?"

The Backster "You Phase" Three-Spot version differs only in respect to question #9 (which Backster labels #37), which is added to the question sequence after the third CQ and followed by the second Symptomatic question. Using this version would normally require that three (3) chart sequences be run rather than four (4) charts as on the Two-Spot version. Cleve Backster does not recommend use of the 3-Spot "You Phase" ZCT.

Use of the Backster "You Phase" requires the PDD examiner to re-word RQ 7 (#35) and RQ 9 (#37) with more than just an addition of a prepositional or other phrase. The re-wording must keep the question strengths equal in each of the RQ's; e.g., "Did you shoot John Smith?"; "Regarding the shooting of John Smith, did you do it?"; "Did you fire the shot from the gun that killed John Smith?" An incorrect example would be "Did you kill John Smith?"; "Did you kill John Smith last week?"; or, "Did you kill John Smith last week by shooting him?"

Additionally, use of this technique requires that the Sacrifice Relevant question be tied directly to the issue in RQ#5 (#33); e.g., "Concerning whether or not you caused the death of John Smith, do you intend to answer truthfully ----------?" as opposed to, "Concerning the death of John Smith, do you intend to answer truthfully --------?"

Backster Scoring System (Brief Overview):

Backster's method of scoring differs widely from the NCCA and Utah systems. He does use a seven-point system. There are numerous scoring criteria and caveats to his system – too numerous to discuss here. Those scoring criteria least likely to be known or used by those not trained in the Backster Technique will be briefly explained below (for informational purposes only). For a complete list and explanation of Backster's chart analysis rules, see chapter 12 of James Matte's *Forensic Psychophysiology Using the Polygraph*.

Either/Or Rule:
In order to assign a score of +/-2 to any question, there must be a significant reaction in either the relevant or control question being compared. If the relevant question reveals no reaction, it should be compared to the adjacent comparison question with the greatest reaction. If the relevant question contains a significant reaction, it should be compared to the adjacent comparison question containing the smallest (or no) reaction. (Backster's anti-climax dampening concept predicts the question type causing the examinee the most concern should dampen the other question type). Therefore, there should not be a SR in both the CQ and RQ. If so, Backster assumes there is a problem with the CQ, which must be remedied.)

Green Zone Abuse Rule:

If a comparison question's reaction is at least four times as dramatic as the relevant question, it is improper to compare it to the other adjacent comparison question with little or no reaction.

Reaction Intensity Upgrading Rule:

To upgrade to a +/-3 (from a +/-2), there must be a significantly more dramatic reaction than required by the Either/Or Rule.

Presence of Reaction Via Deduction Rule:

This rule applies to the breathing and cardio channels, and a maximum score of +/-1 can be assigned.

If relief starts within five seconds of the subject's answer, and there is no apparent reaction in the preceding question, then it can be inferred there was a reaction (though not visible to the naked eye) to the prior question.

If relief starts after five seconds beyond the subject's answer, and there is no apparent reaction within that same zone, then it can be inferred some type of reaction did occur in that same question.

THERE ARE ADDITIONAL SCORING RULES. DO NOT ATTEMPT TO USE THE BACKSTER SCORING SYSTEM WITHOUT PROPER TRAINING IN HIS METHOD!

- Decision criteria (for three charts and two relevant questions):
    - DI = total score of -13 or less
    - NDI = total score of +7 or greater
    - INC = -12 to +6
    - SPOT SCORES ARE NOT CONSIDERED

- Decision criteria (for three charts and three relevant questions):
    - DI = total score of -19 or less
    - NDI = total score of +10 or greater
    - INC = -18 to +9

- SPOT SCORES ARE NOT CONSIDERED

It would **NOT** be appropriate to use most computer scoring algorithms with the Backster Techniques since the algorithms would not be able to compute "presence of reaction" on the RQs in order to know to which CQs the RQs should be compared.

CANADIAN POLICE COLLEGE MODIFIED ZONE COMPARISON TEST

ZONE COMPARISON "A-SERIES" TEST (Single-Issue – Horizontal Total Score)

Q#	Q Type	Score As
1.	Irrelevant/Norm Question	Neutral
2.	Symptomatic Question	Optional
3.	Stimulation Question or Sacrifice Relevant Question*	Not Scored
4.	Universal Comparison Question (Lie, Exclusive) **	Comparison
5.	Strong Relevant Question	Relevant
6.	Primary Comparison Question (Exclusive) ***	Comparison
7.	Strong Relevant Question (Re-Worded)	Relevant
8.	Irrelevant/Norm Question	Neutral
9.	Related Comparison Question (Exclusive) ****	Comparison
10.	Strong Relevant Question (Re-Worded, again)	Relevant

* "Do you intend to answer truthfully each and every question on this test?"
In test situations where the examinee is particularly emotional, the question is changed to a Sacrifice Relevant Question, *e.g.*, "Do you intend to answer truthfully every question about Mary's allegations?" but remind the examinee about the control questions as well.

** Current or Non-current Exclusive Comparison Question – "Not connected with this case, did you ever ---?" or "Prior to the age of ___, did you ever---? or "During the first __ years of your life, did you ever ----?" (Go back at least one year prior to the incident in question). Also, the "Universal CQ is always a "lie" CQ.

*** The "Primary Comparison" is behavior close to the test issue; e.g., "Theft = Steal CQ," "Murder = Hurt/Harm CQ," "Arson = Damage/Destroy CQ," etc.

**** The "Related Comparison" deals with behavior relating in some way to the relevant issue; e.g. doing something illegal or doing something they feel guilty or are ashamed about doing?"

At publication time, the Canadian "B" Series had only one research study to support its validity and reliability which was done by Dr. Charles Honts.

ZONE COMPARISON "B SERIES" TEST (Multiple Issue – Vertical Spot Scores)

Q#	Q Type	Score As
1.	Irrelevant/Norm Question	Neutral
2.	Symptomatic Question	Optional
3.	Stimulation Question or Sacrifice Relevant Question	Not Scored
4.	Universal Comparison Question (Lie) (Exclusive)	Comparison
5.	Secondary or Evidence-Connecting Relevant Question	Relevant
6.	Primary Comparison Question (Behavior Close to Issue)	Comparison
7.	Secondary or Evidence-Connecting Relevant Question	Relevant
8.	Irrelevant/Norm Question	Neutral
9.	Related Comparison Question (Behavior Related to Issue)	Comparison
10.	Secondary or Evidence-Connecting Relevant Question	Relevant

- Minimum of three charts are conducted.
- Compare RQ to preceding CQ.
- Change the test question sequence so that each RQ is next to each CQ once.
- Use seven-point scale – Utah system with cut-offs of +/- 6 on "A Series."
- If a "zone" is spoiled by an artifact in either the RQ or CQ, the entire "zone" is repeated at the end of the question sequence – if several "zones" are spoiled, a fourth chart is run.
- "B Series" scored with Utah seven-point scale with cutting scores at each spot of +/-3.
- Examinee is not scored as "fail one – fail all." If DI to one spot and Inconclusive or NDI to other spots, then reported that way.
- If examinee fails "A-Series," then a "B-Series" is usually not run. If he passes the "A-Series," then a "B-Series" would be run to determine indirect involvement or guilty knowledge.
- "Stimming" the examinee between charts is allowable. E.g., "Did anything come to your mind about any of the questions during the test?" "If I was to tell you that one of the questions bothered you more than any of the others on the test, which one would you say that it was?" "Are you still satisfied that you can still answer every question on the test truthfully & accurately?"
- The examinee is not directed toward either the RQ's or the CQ's.
- A memorized and standardized pre-test interview (of approximately 25 pages) is used.

REID TECHNIQUE

The Reid Technique was the test format from which the Army MGQT was developed by USAMPS. John Reid had several different formats evolve from his technique, some of which were also subject to validation studies. He had a test structure for both a single-issue and multi-facet version of his technique, and both required specific procedures with the pre-test interview and the data collection phase and the scoring phase in which both numerical scoring and behavioral analysis was considered in the overall decision rules. Dr. Frank Horvath had a variation on which he conducted several published studies at Michigan State University.

Q#	Q Type	Score As
1.	Irrelevant/Norm Question	Neutral
2.	Irrelevant/Norm Question	Neutral
3.	Secondary or Primary Relevant Question*	Relevant
4.	Irrelevant/Norm Question	Neutral
5.	Primary Relevant Question	Relevant
6.	Comparison Question (Inclusive – No "Time" Bars)	Comparison
7.	Irrelevant/Norm Question	Neutral
8.	Secondary Relevant Question	Relevant
9.	Secondary or Primary Relevant Question*	Relevant
11.	Comparison Question (Inclusive – No "Time" Bars)	Comparison

*Whether a Secondary or Primary Relevant Question would likely depend upon whether or not the examiner was doing a single-issue or multi-facet test.

A. Used a "Straight-Through" test as listed above and also used a Silent Answer Version on the "Straight-Through" Test. If doing a single-issue test, which would have been a 3 RQ spot version then RQ 8 would have been removed. He also used a Mixed Series on both the single issue version and the multi-facet version.

B. He also used a "Yes" Test using the "Straight-Through" version with instructions to answer all questions with a "Yes" when he suspected countermeasures were being used.

C. Global evaluation was used – fact analysis, behavioral assessment, numerical scoring (which was given preference over behavioral assessment), and when there is any significant difference between scoring and behavior, then a re-examination would likely be scheduled.

At publication time, the Matte Quadri-Track ZCT and the Gordon Integrated ZCT have each had a single validity and reliability study done to support their uses. The former was conducted by James Matte and the latter was conducted by Nathan Gordon. The Canadian "B" Series also has only one research study to support its validity and reliability which was done by Dr. Charles Honts.

MATTE QUADRI-TRACK ZONE COMPARISON TEST

(Single Issue – Backster Scoring – Overall Horizontal)

Q#	Q Type	Score As
1. (14)	Irrelevant/Norm Question (Yellow Zone)	Neutral
2. (39)	Sacrifice Relevant Question (Yellow-Red Zone) (SF)	Not Scored
3. (25)	Symptomatic Question (Black Zone)	Not Scored
4. (46)	Comparison Question (NCEC) (Green Zone)	Control
5. (33)	Primary Relevant Question (Red Zone)	Relevant
6. (47)	Comparison Question (NCEC) (Green Zone)	Control
7. (35)	Primary Relevant Question (Re-Worded) (Red Zone)	Relevant
8. (23)	Inside-Track Comparison Question (Green -White Zone)	Control*
9. (24)	Inside-Track Relevant Question (Red -White Zone)	Relevant**
10. (26)	Symptomatic Question (Black Zone)	Not Scored

* "Are you afraid that an error will be made on this test regarding (Issue)?"

** "Are you hoping an error will be made on this test regarding (Issue)?"

- The "Inside-Track" is used to guard against false-positive responses of the truthful / innocent examinee who is naturally afraid the test will not work, and he will be labeled as a liar;
- This technique has been fully approved by Mr. Backster as an additional (substituted) "zone" added to his test formats;
- May be used with the 3-Spot Backster "You Phase";
- May be used with the Backster "Exploratory" – labeled as the Matte Quinque-Track Zone Comparison Test;
- Matte has his own versions and modifications of his original versions of these formats;
- Uses Backster scoring (except "Green-Zone Abuse Rule" as RQs are compared to preceding CQs and below rule) and Backster "Notepack" procedures in developing his pre-test and testing phases.

- Matte Dual Equal Strong Reaction Rule:

  When the relevant and comparison questions (in either the breathing or cardio channels) both contain equally maximum reactions, then a score of -1 is assigned to that particular spot. If the reactions are mild and equal, but there is no presence accompanying parasympathetic responses, then a score of 0 is assigned.

  There are other Matte formats with the "Inside-Issue" based upon the other Backster test formats; *e.g.*, Exploratory and SKY.

GORDON INTEGRATED ZONE COMPARISON TESTS

The Gordon Integrated Zone Comparison Test is a variation of the original Utah Zone Comparison Test, but he had various formats which can make the test single-issue (as the current Utah Single-Issue ZCT) or Multi-Facet (as the current Federal ZCT) or multi-issue (more than one crime in the test sequence). He uses a Silent Answer Test on the first chart (which some examiners claim is optional when they have been questioned during an AAPP quality review concerning the deviation from the SAT). The technique also uses the Horizontal Scoring System which was developed by Nathan Gordon and includes a scoring algorithm computer program as well. It also differs from the Utah Technique in that it uses a countermeasures question as the last question in the series.

Q#	Q Type	Score As
1.	Irrelevant/Norm Question	Neutral
2.	Outside Issue Question (Similar to Symptomatic Question))	Optional
3.	Ice-Breaker Question (General Focus Sacrifice Relevant)	Not Scored
4.	Irrelevant/Norm Question (Optional)	Neutral
5.	Comparison Question (CEC – 2 years back from Crime)	Control
6.	Primary or Secondary Relevant Question (Flexible RQ)	Relevant
7.	Irrelevant/Norm Question (Optional)	Neutral
8.	Comparison Question (Inclusive – "In your entire life-—")	Control
9.	Primary or Secondary Relevant Question (Flexible RQ)	Relevant
10.	Irrelevant/Norm Question (Optional)	Neutral
11.	Comparison Question (CEC – 2 years back from Crime) *	Control
12.	Primary or Secondary Relevant Question (Flexible RQ)	Relevant
13.	Countermeasure Question (Evaluated for Response)	Not Scored

* Same behavior as CQ5 but with a small addition; *e.g.*, ("Prior to 2001, did you ever tell a serious lie" – "Prior to 2001, did you ever tell a serious lie to someone who loved you").

- Chart 1 uses a Silent Answer Test; Chart 2 is Mixed (7-2-5-12-8-6-11-9-13); and Chart 3 is Mixed (1-2-3-9-5-8-12-11-6-13); Chart 1 does not use CMQ13;
- Also has the IZCT2 which is a Single-Issue ZCT with the Matte Inside Issue Series as CQ11 and RQ12 with a Mixed Series – 2nd Chart (7-2-5-9-8-6-11-12-13) and a Mixed Series on the 3rd Chart (1-2-3-6-5-9-8-12-11-13; Chart 1 does not use CMQ13;
- Also, has a IZCTs-k-y where CQ5 is the "Suspect", RQ6 is the "Know", RQ9 is the "You", and RQ 12 is a Secondary RQ; Chart 2 is Mixed (7-2-5-12-8-6-11-9-13) as is Chart 3 (1-2-3-9-5-12-8-6-11-13); Chart 1 does not use CMQ13;
- The Horizontal Scoring System is used with +/- 13 as Cutting Scores.
- Can be single issue, multi-facet, or multi-issue.

ARTHER SPECIFIC ACCUSATION TEST

The Arther Technique, also known as the Arther Specific-Accusation Test (SAT), employs behavior analysis and chart analysis similar to the Reid Technique in its decision-making process. When there is a conflict between the behavior analysis and the chart analysis, the subject is re-examined. Its chart analysis system uses various size check marks in a Chart Analysis Form depicted at the end of this discussion, to discriminate responses. The Arther test is normally composed of series of ten test questions in the format depicted below (Arther 1996):

Question Number	Question Type	Question Example
1	Irrelevant	Do you live in the United States?
3T	Known Truth Crime CQ	(No Example at R.O. Arther's request)
3K/B	Knowledge	Do you know for sure who…?
5	Main Crime Relevant	Did you…?
6	Non-Exclusive Control	During your entire life, even once did you ever…?
8	Relevant	Did you help plan…?
8T	Known Truth Crime CQ	(No Example at R.O. Arther's request)
9	Relevant	Did you know beforehand…?
10	Non-Exclusive Control	During your entire life, even once did you ever…?
11	Irrelevant	Do you live in Canada?

The two non-exclusive control questions, number 6 and 10 contain sub-categories 6a, 6b and 10a, 10b, each of which represents a different non-exclusive control question. The issue to be tested determines which control questions are used.

In the formulation of the control and relevant test questions, the Arther Technique has criteria of Eight Known-Lie Question Principles, Four Golden Rules, and Ten Commandments (Arther 1983, 1984, 1996). They are quoted as follows:

The Eight Known-Lie Question Principles:

1. The KLQ MUST be a question to which we can automatically presume a person is lying.
2. A KLQ must NOT be a crime question.
3. The KLQ MUST be of lesser emotional impact than are the crime questions.
4. The KLQ MUST be generally worded.
5. The KLQ MUST be a question whose motive basically matches the motive of the crime question it follows.
6. The reason (justification) given to the person for using the KLQs MUST be thoroughly and properly explained during EVERY pretest interview.
7. During the pretest interview, the KLQs MUST be read verbatim to the person and he must answer them exactly as he is going to answer them on the first test.
8. The KLQs MUST be as carefully chosen as are the crime questions.

<u>The Four Golden Rules:</u>

"I must always ask myself two questions regarding each and every crime question."

GR1: Should This Issue Even be Asked?
Presuming the answer is "Yes" to the above question, then the Second Golden Rule takes effect:

GR2: Is The Proposed Crime Question Properly Worded?

In addition to the above Golden Rule of Crime-Question Wording, there are two others:

GR3: Every Crime Question Must be Emotionally Charged.
An emotionally charged crime question is obtained in two ways:
<u>First</u>: Using an "Explosive" Verb.
<u>Second</u>: Keeping the Question Short.
The main way to keep a question short is to eliminate prepositional phrases. Each prepositional phrase makes a question longer, can confuse the listener, and introduces a new case fact.
If a prepositional phrase is truly needed, if possible limit it to just one and if possible have it at the beginning of the question.

GR4: Never Count Upon My Fantastic Pretest Interview to Make up for a Poorly Worded Crime Question.

The Ten Commandments:

1. Each crime question must deal with only *one issue*. Never use the words "and" or "or."
2. Regardless of how the person answers, never ask a question that implies guilt. That is, never use as a crime question a "Are you still beating your wife?" type of question.
3. Never *unintentionally* ask a crime question that gives away the key to a good Known-Solution Peak-of-Tension test.

4. Remember that very likely at least some of the case facts may be wrong.
5. Is it possible that the liar can answer this crime question truthfully? If that issue is crucial and must be asked, try to limit the crime questions to just one question of this type.
6. Is it possible that a truthful person will lie to one of the proposed crime questions? If so, NEVER ask it! The reason is that some truthful persons have tried to "beat the lie detector" when such a question is asked, thus misleading the expert into thinking the person was lying.
7. Ask only four crime questions during any one session.
8. Word the questions so that they flow smoothly.
9. Make sure that even if the person had a minor part in the crime, he will be lying to at least one of the crime questions.
10. Each word used in every question must be a completely understood by the person. The best way to ensure that he understands is to use the very terms and verbs he used.

In the Arther Technique, four crime questions are presented in any one polygraph test. Thus the four crime questions are asked in one series of questions; there is no second set of test questions with different questions. Typically, these four crime questions are asked on three separate tests. A Polygraph Sensitivity Test using colored cards (red, yellow, and yellow with a red dot), is administered shortly after the pretest interview begins, and a different type of stimulation test, namely the Double Verification Test (DVT), a numbered card test, is administered between the first specific-accusation test and the second specific-accusation test.

In the formulation of the relevant (crime) questions, number 5 is the most important in that it deals with *primary* participation or *direct* involvement. 3K is the *knowledge* question and must deal exactly with the same specific issue as question number 5. The second most important relevant question is number 9, which deals with secondary participation. Relevant question number 8 deals with this particular person and his possible involvement in the crime. This question (8) can relate to the person's knowledge regarding the location of the stolen property or conspiracy to commit the crime. There are times when the knowledge question (3K) is not appropriate for the occasion, in which case it can be replaced with a fourth relevant (crime) question numbered 3B. After formulating the relevant questions, the polygraphist should determine whether any of the crime questions reveal the *Key* that could be used in a Known-Solution Peak-of-Tension test. If affirmative, then the polygraphists must ascertain whether that is the only *Key* available and whether or not it is critical. When in doubt, the crime questions take precedence over peak-of-tension tests. When formulating the crime questions, the polygraphist should first make a list of six crime questions from which to choose, in order to avoid missing an important issue. From these crime questions the polygraphist narrows the list to those that meet the above criteria. (Arther 1984; 1996)

Arther's Known-Lie Test Chart Analysis Form

Using three different size check marks for all four tests, and starting with each test's second question, check ONLY the <u>two</u> largest reactions in each recording of each test.

Do the DVT checks indicate that the examinee might be a spot responder? Y/N (Circle Yes/No)
Is the breathing pattern the same in the PST as in the SATs? Y / N

Is the breathing pattern the same in the DVT as in the SATs? Y / N
During warm-up periods, when BP cuff is being inflated, and after cuff deflated, is the breathing the same as in PST? Y / N DVT? Y / N SATs? Y / N

Currently, there are no known validity or reliability studies that have been published to support a known level of accuracy with use of this technique. The technique is still widely-used throughout the United States and Canada since Mr. Arther trained hundreds of law enforcement polygraphists at his schools until his death in 2007 (besides his home location in New York City, he also had satellite schools at the Missouri Highway Patrol Police Academy, the New York State Police Academy, the Ohio State Highway Patrol Police Academy, and other police academies as well).

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OTHER TESTING FORMATS

There are many other recognized testing formats in use today; however, there are not enough specific studies reported to support their validity or reliability. Most of these are techniques that differ slightly from validated techniques but have had limited or no studies supporting their variations. This does not mean that they are not allowed to be used; it simply means that when they are used by an examiner, the examiner must follow the procedures exactly so that further deviation from the originally validated techniques (upon which they are based) does not occur thereby furthering the argument that their reliability is "diluted." Also, before using these techniques/formats, the examiner must receive formal training in their use and analysis in order for the tests that he conducts to be considered as acceptable.

Formats such as the Relevant-Irrelevant Technique and Modified Relevant-Irrelevant Technique and the Backster Exploratory ZCT and the Backster SKY ZCT and a variety of test techniques and formats developed and taught by Lynn Marcy have great utility in the polygraph field, but examiners must realize that their use requires formal instruction, not only in test construction and question formulation, but in the pre-test requirements as well as the test data analysis systems designed for these techniques/formats.

References:

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CHAPTER TEN

PEAK OF TENSION TESTS (RECOGNITION TESTS)

The Peak of Tension Test (POT), also known as the Known Solution POT (KSPOT), was developed by Leonarde Keeler to determine possible concealed knowledge possessed by an examinee.

It is used most frequently after a specific-issue deception test in which a deception indicated (DI) opinion has been rendered. It is also appropriate and important to conduct Known Solution POTs after specific-issue deception tests (when available) where the decision is NDI in order to further support the NDI decision when no significant reactions are present on the POTs.

The known solution POT is utilized when an examinee denies any knowledge regarding a specific element of a crime or incident that has been verified through investigation or other means.

The searching POT (SPOT) is utilized when the crucial key area is suspected to be known by an examinee who denies any such knowledge. This format is also known as the unknown or probing POT.

Question Review:

During the pretest interview all POT and SPOT questions are reviewed with the examinee prior to the collection of charts. The questions are reviewed in the sequence in which they will be presented during the in-test phase.

The POT key question addresses a fact about the crime that should be known only by the perpetrator, the examiner, and the investigators, and perhaps the victim(s).

The SPOT key question addresses a fact about the crime known only by the perpetrator.

At least two padding questions are used before and after the key. They must be similar to the key, and the same prefix should be used with padding questions and the key question.

Padding questions must not involve the relevant issue.

The False Key is an optional padding question that has special meaning to the examinee.

It is always placed in the second position and has at least one padding question between it and the key.

The principal of the false key is similar to a comparison question.

The examinee is expected to react to it because he or she has been sensitized to it; the deceptive examinee should display the most significant response to the key.

A false key is only used in a known solution POT. The false key technique should not be used without the Examiner having had training in its use.

The Preparatory Phrase is the prefix to the first question of a POT or SPOT.

It is utilized to focus the examinee's attention on the issue being tested.

It is only stated at the beginning of the first question. An acceptable example is…

> Regarding the amount of money stolen from that wallet…?

The Prefix Phrase is a continuation of the preparatory phrase.

It is asked with each question utilized within the POT and SPOT structure.

Since the purpose is to test for concealed knowledge, the prefix phrase is worded as in the following examples:

> "Did you steal…?"
> "Do you know if...?"

NOTE: The phrase, "Do you know…" is generally not used as a prefix phrase as the guilty person *knows* what the key item is, which means his denial to EVERY item (key and padding) would be a lie. If the every question is prefaced with "was it," then both the truthful and deceptive person would have to answer "I don't know."

Known Solution Peak of Tension (Recommended for someone who was NDI on the deception test).

Preparatory phrase	Regarding the place that in that house that money was stolen from:
Prefix (& Padding Q)	Do you know if it was in an empty washing machine?
Padding question	Do you know if it was in an unlocked, floor safe?
Padding question	Do you know if it was in a plastic bag in a toilet tank?
Key Question	Do you know if it was in a container in a freezer?
Key question	Do you know if it was from a box in the food pantry?
Padding question	Do you know if it was from under a computer desk??
Padding question	Do you know if it was from some clothing in a closet?

Known Solution Peak of Tension (Recommended for someone who was DI on the deception test).

Preparatory phrase	Regarding the place that in that house that money was stolen from:
Prefix (& Padding Q)	Did you steal it from an empty washing machine?
Padding question	Did you steal it from an unlocked, floor safe?
Padding question	Did you steal it from a plastic bag in a toilet tank?
Key Question	Did you steal it from a container in a freezer?
Key question	Did you steal it from a box in the food pantry?
Padding question	Did you steal it from under a computer desk?
Padding question	Did you steal it from some clothing in a closet?

Searching POT

In the SPOT, the key is unknown and the examination normally consists of nine questions. There must be at least two padding questions at the beginning and end of the sequence. The final question is normally a "Catch-All" or "Coverall" question; *e.g.*, "(Something/someplace/someone) else I have not mentioned yet?"

The SPOT is normally utilized following a conclusion of DI on a deception test and after all Known Solution POT's have been conducted;

The question following the prefix phrase is worded as in the following example:

…somewhere else not mentioned?

It is normally placed in the seventh position.

It is intended to cover any other area or possible key not previously addressed.

Preparatory phrase	Regarding the location of that property…
Prefix	Do you know if it is located in…?
Padding question	…Geneva?
Padding question	…London?
Key choice	…area A?
Key choice	…area B?
Key choice	…area C?
Key choice	…area D?
Padding question	…Frankfurt?
Padding question	…Milan?
Coverall	…an area (I have) not mentioned?

Both the SPOT and KSPOT require three charts.

The first two charts are asked in the above sequence.

The third chart is reviewed and conducted in reverse sequence.

If no opinion can be rendered after three charts, a fourth, un-reviewed, mixed sequence chart may be collected. Some techniques allow all charts after the first chart to be mixed as long as the key question is at or close to the middle of the series.

The known solution POT examination consists of five to nine questions.

If more than one POT is conducted, the key should not be placed in the center position of the examination every time.

Only one key can be presented on each POT test.

A visual stimulus can be utilized in the POT to ensure the examinee knows the sequence of the examination.

All questions are worded to elicit a "no" answer.

The KSPOT and SPOT are not evaluated numerically as in comparison question formats.

If the examinee displayed physiological responses to the key item on a KSPOT or to the same question/item on a SPOT in at least two of the three charts collected, the examiner must conclude that there were significant responses.

If the examinee does not display evaluative criteria as above, then the examiner must conclude there were no significant responses (NSR) or no recognition indicated (NRI).

An opinion of significant response (SR) or recognition indicated (RI) generally indicates concealed knowledge.

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CHAPTER ELEVEN

CONCEALED INFORMATION TEST (RECOGNITION TEST)

The CIT, also referred to as the "Concealed Knowledge Test" (CKT) or "Guilty Knowledge Test" (GKT), like the POT, is a recognition test – not a deception test.

Unlike the CQT, the CIT has both construct validity and criterion validity, so it has few, if any, opponents in the scientific community. Some CQT opponents even argue for the CIT's admissibility in US courts as it satisfies the *Daubert* requirements, in that, among other things, it is generally accepted in the relevant scientific community as a valid test and the probability of error is easily calculated.

The CIT is similar to the POT; however, only the EDA channel is scored. (You should still connect and monitor the cardio and pneumo sensors in order to comply with most professional and legal requirements.)

The CIT is appropriate when the examinee claims not to have detailed knowledge about specific facts of an offense. If the key items have been leaked to the examinee, then a CIT is improper.

Like the POT, each CIT should have five or six items: one key and four or five padding (control) items all of which are equally plausible alternatives to the innocent examinee. (The innocent examinee should not be able to easily and correctly guess the key item.) Unlike the POT, the key item's position is random, except that it should not be placed in position number one, as that is a buffer question (i.e., not scored) to which most examinees will respond significantly.

Run a minimum of three (different) CITs.

Rationale: Assume three CITs each containing six items. The first is item on each is ignored as explained above. The innocent examinee therefore has a 1 in 5, or 20% chance of randomly reacting most significantly to the key item in test one. The same is true on test two; however, the probability of the innocent examinee responding to the critical items on both tests (one and two) is the product of their individual probabilities, i.e., 20% of 20%, or 4%. Add a third CIT, and the probability of an innocent examinee reacting the strongest to all three key items is less than 1% (0.008).

Key items can be anything that should have stood out to the guilty party, e.g., the weapon used in a robbery, the item stolen in a burglary, etc. (That is, the perpetrator should have seen and be likely to remember each key item.) A viewing of the scene in a serious case is beneficial in developing good key and padding items.

Explain to the examinee that you are going to conduct a few tests, telling him he/she will be presented with a few lists of items. When he/she hears those items on the test, he/she should repeat each back to you, explaining that if he/she does know the critical items, he/she will respond

to them the greatest, and you will know he/she is concealing knowledge – knowledge possessed by only the investigators, victim and the perpetrator.

Review each CIT with the examinee, explaining that the items will not be presented in the same order during the actual tests. Place no emphasis on any single item. Simply confirm the examinee claims no knowledge of the key items you are testing.

Allow 15 seconds between item presentations.

Scoring:

If the examinee reacts strongest to the key item (EDA only), the score for that CIT is two (2). If the key item receives the second strongest response, then the score is one (1). If the key item receives neither the greatest or second strongest response, the score is zero (0). David Lykken suggested scoring cut-offs equal to the number of CITs. (In other words, if three CITs are run, making six (6) the highest score possible, then a score of three (3) or more would result in a conclusion of concealed knowledge.) REMEMBER not to score item one (1), the buffer item.

Probability tables can be computed, and some are published commercially.

CIT Example:

1. If you're the person who broke into that building, then you know what items were stolen. Repeat each item after I say it. Telephone
2. Computer
3. Television
4. Stereo
5. VCR
6. Monitor

References:

Ben-Shakhar, G. (2002). Trial by polygraph: reconsidering the use of the guilty knowledge technique in court. *Law and Human Behavior, 26*(5), 527-41.

Krapohl, D. (2001). A Polygraph Technique for Evidentiary Applications. *Polygraph, 30*(1), 43-46.

Lykken, D. (1998). *A Tremor in the Blood: Uses and Abuses of the Lie Detector* (2nd ed.).

CHAPTER TWELVE

COMPARISON QUESTION FORMULATION GUIDELINES

The AAPP Board of Directors, in concert with the NCCA and Utah researchers, understands the central component of any PDD test is the subject's differential responses to relevant and comparison questions.

How questions are structured and sequenced represents the principal differences among PDD tests.

A comparison (formerly called "control") question is one in which the physiological responses to it are compared to the physiological responses of the relevant question(s) to determine which is more salient.

The theory is truthful examinees will be more concerned, and therefore, more physiologically aroused, with the comparison questions than the relevant questions. The opposite is true for the deceptive.

The term often used in explaining this phenomenon is "psychological set." Psychological set is based on the above theory that an examinee will focus his attention on the test question type (relevant or comparison, and in some systems, outside-issue) that causes him/her the greatest psychological concern. The scientific term for this phenomenon is "salience" – the question or questions which hold the most "meaningfulness/significance" to the Examinee which may not necessarily constitute "threat" or "fear" to the Examinee as was originally taught in earlier polygraph instruction for many years.

Well designed comparison questions contain basic elements:

The comparison question should be structured in such a way that the examinee's answer is, in all probability, a lie, or the examinee is uncertain if his/her answer is truthful (which could cause psychological concern). It should involve some category of misdeed or behavior in which the examinee has more than likely engaged in the past which they wish to conceal.

The comparison question should be confined to past actions. These are tangible, concrete, unchangeable experiences the examinee can focus on during testing.

Future intentions vary from time to time in a person's life. They do not necessarily involve reality or provide a firm, solid focal point for the examinee.

There is no published research supporting the use of comparison questions designed to inquire as to future intent. Therefore, comparison questions such as, "Do you plan to use illegal drugs in the future?" are not recommended by the AAPP Board of Directors.

The question should be similar in nature to the specific crime or issue being tested. (Note that the Utah and CPC tests, discussed above, more broadly define "similar in nature" than do others.)

In many cases the same action verb used in the relevant question is used in the comparison question.

For example, if the relevant question addresses stealing, the comparison question should ask about stealing, e.g., "…did you ever steal anything?"

When conducting an examination of an adult accused of sexually abusing of a child, the use of lie comparison questions is recommended in order to avoid capturing other, unknown sex crimes that might potentially cause greater arousal to CQs than the RQs, resulting in a false negative.

NOTE: The Federal ZCT requires lie-type CQs in such tests.

If the examiner determines sex comparison questions are preferable due to the circumstances of a given exam, the sex comparison questions should be separated from the relevant questions by the use of an adult category bar.

For example, if an examinee is suspected of having sexual intercourse with his five year old daughter, a proper comparison question could be, “Have you ever performed an unnatural sex act with an adult?”

Caution should be exercised in the use of an adult category bar due to possible rationalization on the part of the subject.

The question should be non-relevant to the crime or issue being tested.

Designing non-relevant comparison questions is critical to the outcome of polygraph examinations regardless of the format employed.

"Relevant" comparison questions can be detrimental to the polygraph process when testing innocent and guilty persons. Comparison questions that are relevant to the tested issue may offer no clear alternative to the innocent examinee, and could cause a false positive result. Moreover, the guilty examinee's psychological set may be focused on the comparison question(s) rather than the relevant question(s).

Since comparison questions are normally broader in scope than relevant questions, a comparison question that is in fact relevant has the potential to overpower the “true” relevant question. This could result in a false negative.

One way to ensure this separation is to use a time, place or category bar.

The qualifier or bar will be placed at the beginning of the comparison question, for example,

Prior to your 18th birthday, did you ever steal anything?
Not only does a barring phrase separate the relevant issue from the comparison questions, it can serve to broaden the scope of the probable lie comparison question, by making the examinee even more uncertain of his answer.

It should be noted that several, authoritative studies have all revealed the use of "time-bars' and/or exclusionary phrases makes no difference in the outcome of the examination – inclusive as well as exclusive CQs work equally-well in PLC deception tests. Some test techniques (e.g., Backster and NCCA), however, require exclusive-type CQs.

The comparison questions should be broad in time and scope so that they capture as many of the examinee's past experiences as possible. Theoretically, as the time and scope of the comparison question increases, the stronger the question becomes.

We have provided a preferred list of comparison questions. The list is not all-inclusive, but provides a substantial variety of questions. The examiner must be aware that even the following comparison questions may be relevant if utilized in an improper context. The examiner always must evaluate each comparison question to ensure it is proper based upon the circumstances of the particular examination.

Some Further CQ Rules:

1. There must be "balance" between the CQs and RQs which means that if the examiner spends about ½ hour discussing the RQs with the examinee, then the examiner must spend about ½ hour discussing the CQs with the examinee. Simply reading the CQs to the examinee without discussion to create probable lie or probable doubt about lying situations to the CQs defeats the purpose of the CQs and destroys the validity of the examination.

2. CQs and RQs should be similar in length as much as possible which is difficult, at times with time bars and excluders; e.g. "Other than what you told me, ------?"

3. If the victim's name is used in any of the RQs, then the victim's name should be used in the CQs as a category type "bar" – some argue that this makes a CQ relevant, but it is excluding the relevant-issue by the wording, "Not concerning (victim's name), did you ever-----?"

   RATIONALE: Doing so prevents the examinee from claiming that each time he/she hears the accuser's name he becomes angry, enraged, disgusted, upset etc., resulting in physiological arousal. It removes their argument when shown to them that the arousal only occurs in the RQs but not in the CQs – even though the victim's name is being used in both types of the questions. PLEASE BE AWARE THAT THERE IS NO RESEARCH SUPPORTING THIS USE OF THE VICTIM'S NAME IN COMPARISON QUESTIONS AS VALID, BUT THERE IS ALSO NO RESEARCH THAT REFUTES THIS PRACTICE OR IN ANY WAY INDICATES THAT IT IS NOT VALID. (There is non-polygraph research that indicates that name recognition can cause sympathetic arousal which means that we should not use a name in the RQs – other than in the Sacrifice RQ – unless absolutely necessary. If it becomes necessary, using the same name as an excluder in the CQs would, logically, create a balance between the RQs and the CQs with sympathetic arousal).

RQ: Did you touch the bare genital area of Mary?

CQ: Without regard to Mary, did you ever do anything sexually with another adult that most people would be ashamed to admit?

CQ: Not concerning Mary, did you ever tell even one serious lie to anyone about anything?

4. Comparison questions should be as vague and general as possible so that the examinee is either lying or uncertain whether he is lying in order to create as much of a threat as possible for the psychological set to develop properly for the person with truthful (to the RQs). The more specific the CQ, the more likely there will be no lie or doubt about lying by the examinee thus there will be little, if any, threat potential which will direct the truthful examinee's emotions to a psychological set created by the CQs and will result in the psychological set being targeted to the RQs and cause false positive responses.

PROBABLE LIE COMPARISON QUESTIONS

- LIE / CHEAT / STEAL COMPARISON QUESTIONS

- The following questions generally do not require the addition of a time, place or category bar and could conceivably be used for specific issue testing or police applicant testing as long as the action verb is not relevant to the issue(s) being tested.

Did you ever lie to make yourself look important?

Did you ever lie to a personal friend or relative?

Did you ever lie to get out of an obligation?

Did you ever lie to cover up a mistake or avoid trouble?

Did you ever say anything about someone that wasn't true?

Did you ever hide any information from a personal friend or relative?

Did you ever cheat in school?

Did you ever reveal the answers to an examination to another student?

Did you ever cheat on your time card?

Did you ever steal anything from a friend / relative?

- TRUST / BETRAY COMPARISON QUESTIONS

The following questions generally do not require the addition of a time, place or category bar:

Did you ever violate your own integrity?

Did you ever violate an honor code?

Did you ever take credit for something you did not do?

Did you ever betray the trust of a friend or relative?

Did you ever reveal a confidence entrusted to you by a friend / relative?

Did you ever disclose a personal secret furnished to you by a friend?

Did you ever violate your own code of ethics?

Did you ever reveal information entrusted to you?

Did you ever intentionally mislead or deceive anyone?

Did you ever disregard a rule or regulation because you thought it was unnecessary?

Did you ever take credit for something you really did not do?

Did you ever disregard or flaunt a rule or regulation because you thought it was foolish or unnecessary?

Did you ever hurt the feelings of someone who might have loved or trusted you?

- The following thought-provoking questions are often only be utilized in a screening format, and are the "Are you the type of person…?" comparison questions.

They generally do not require the addition of a time, place or category bar:

Are you the type of person who lies if you make a mistake?

Are you the type of person who talks about people behind their backs?

Are you the type of person who takes credit for someone else's work?

Are you the type of person who betrays a friend?

Are you the type of person who cannot be trusted with a personal secret or confidence?

Are you the type of person who betrays the trust of a friend?

- "Yes" answered comparison questions that generally do not require the addition of a time, place or category bar:

Are you really an honest and trustworthy person?

Are you absolutely trustworthy?

Are you completely honest with others who trust you?

- LIE - CHEAT - STEAL - FALSIFY COMPARISON QUESTIONS:

- The following questions require the addition of a time, place or category bar to separate them from the relevant issues:

Did you ever ask someone to lie for you?

Did you ever ask someone to cover up for you?

Did you ever deliberately lie to someone who really trusted you?

Did you ever lie to protect your position / your status?

Did you ever lie to get out of trouble / keep from getting in trouble?

Did you ever lie to get even?

Did you ever misrepresent the facts / the truth to gain some benefit?

Did you ever lie to a cop / policeman?

Did you ever lie because you thought you would not get caught / for your protection?

Did you ever lie to someone in a position of authority?

Did you ever deliberately lie to someone in authority for any reason at all?

Did you ever deliberately lie to your boss?

Did you ever intentionally lie to anyone about anything?

Did you ever try to deceive someone by lying?

Did you ever lie to suit your own interests?

Did you ever lie to avoid the responsibilities of your actions?

Did you ever cheat?

Did you ever deliberately provide false information on any official document?

Did you ever steal anything from someone who trusted you?

Did you ever steal company property?

Did you ever steal anything of value?
Did you ever falsify a form for personal gain?

Did you ever lie on a written document?

Did you ever misrepresent the facts to protect yourself / for personal gain?

Did you ever make false entries on an official form?

Did you ever steal anything and not get caught?

Did you ever obtain anything by unlawful means?

Did you ever steal anything from your work place or employer?

Did you ever commit a criminal offense?

Did you ever deliberately do anything dishonest or unethical?

- Betray the trust / character comparison questions that generally require the addition of a time, place or category bar:

Did you ever abuse a position of trust?

Did you ever do anything for which you could be fired / could lose your job?

Did you ever deliberately do anything dishonest?

Did you ever knowingly violate any company rules or policies?

Did you ever misuse your position for personal profit or gain?

Did you ever violate your own professional ethics code?

Did you ever do anything that you would be ashamed to tell someone about?

Did you ever do anything which could bring shame upon yourself or your family?

Did you ever do anything to get even?

Did you ever do anything that you want to keep hidden?

Did you ever betray anyone who placed total trust in you?

Did you ever do anything in your personal life of which you are not proud?

Did you ever fail to accept responsibility for your own actions?
Did you ever do any thing that could cause you a loss of position or status?

Did you ever do anything illegal?

Did you ever deliberately conduct yourself in a dishonorable manner?

- SEX/RAPE/VIOLENT CRIME COMPARISON QUESTIONS

Did you ever do anything sexually with another adult that most people would be ashamed of?

Did you ever engage in any unusual sex (acts/practices) with another adult?

Did you ever lie to anyone about sexual behavior you did with another adult?

Did you ever force an adult weaker than you to do anything sexually they wouldn't have done without the force?

Did you ever hurt anyone?

Did you ever hurt anyone because you were angry?

Did you ever get so angry at someone that you wanted to hurt them?

Did you ever get so angry at someone that you wanted to kill them?

Did you ever get so angry with someone that you really wished that they were dead?

Did you ever get angry and hurt someone then regretted it later?

Did you ever hurt anyone because you briefly lost control of your behavior (or briefly lost control of your temper)?

Did you ever do anything so morally shameful that you would be afraid to face (God, loved one, person they respect the most, *etc.*) with it (or afraid for {God, person, *etc.*} to find out?)

Did you ever make someone weaker than you do something they didn't want to do?

Did you ever consider that it was OK to use force or threats to get what you (wanted/needed)?

- PSYCHOPATH/SOCIOPATH/ANTI-SOCIAL PERSONALITY COMPARISON QUESTIONS

Please keep in mind that if you are dealing with someone diagnosed with this condition or the criminal activity that they have engaged in suggests this, they have very little or no conscience or remorse and usually have no motive for what they do other than "they just want to" which is really the only reason that they feel that they need. Even though they may commit horrendous acts, they still believe themselves to be "good" persons and would not likely be willing to admit their behavior in the pre-test interview or even believe that they are psychopaths.

Did you ever deliberately hurt/injure someone because it made you feel good?

Did you ever steal anything because you thought that you had a right to take it?

Did you ever steal anything just because you wanted it?

Did you ever hurt someone for no reason other than you wanted to?

Did you ever hurt someone without any particular reason why?

Did you ever feel that you should be able to have sex with anyone that you wanted even if they didn't want it with you or at all?

Do you believe that it is OK to do anything that fulfills your desires regardless of who it might affect?

Do you think that you are a bad person because of behavior you have exhibited in the past?

Did it ever make you feel good to get what you wanted even if it caused harm to someone else?

There are many other CQs that can be developed along the same lines as all of the ones starting above on Page 61 or combinations of behavior(s) indicated in these – but you must not go into a test with pre-developed or "standard" CQs since the CQs are to be based upon the pre-test interview and the background of the Examinee. You MUST NOT try to make the Examinee "fit" your pre-conceived CQs, you MUST, however, make the CQs "fit" your Examinee.

What may be important or meaningful or threatening to one Examinee may have absolutely no importance attached to it at all by the next or other Examinees. You may take ideas or possible CQs into the pre-test interview to see if the interview leads to discussion of these or related-behaviors, or if you come to a "dead end," you may introduce your ideas into the CQ discussion. Also, keep in mind that through "expansion" techniques, you may extend CQ material discussions into "ever think about doing (act/behavior, *etc*.), but decided not to" or "changed your mind", *etc*.). This is where non-verbal behavior observation becomes very important since you will be able to see when CQ

material might be causing psychological discomfort to the Examinee during this part of the discussion.

Introduce the CQs as "profile" questions or "character" questions in that you are trying to show that they, not only did not commit the (test) offense, but that you need to build a "profile" to show that their past behavior did not include the type of behavior that they are suspected of having committed with the test offense; *e.g.*, "prior behavior predicts future behavior," and you need to show that they never engaged in any type of behavior related to that of the offense in question. If their profile shows that they did engage in similar behavior as that in the offense in question, it is likely the investigator (and you – depending on how the interview is going) will believe them capable of having committed the offense in question.

DIRECTED LIE COMPARISON QUESTIONS

- The following questions generally may or may not require the addition of a time, place or category bar:

Did you ever take any company supplies for your personal use?

Did you ever violate a traffic law… fishing law …hunting law? (Pick only one.)

Did you ever say something derogatory about another person behind their back?

Did you ever say something that you later regretted?

Did you ever lie to a supervisor or co-worker?

Did you ever lie to a anyone about anything?

Did you ever say something in anger that you later regretted?

Did you ever lie to make yourself look important?

Did you ever say anything about someone that wasn't true?

Did you ever cheat in school?

Did you ever lie to someone who trusted you?

Did you ever lie to get out of an obligation?

Did you ever take credit for something you did not do?

Did you ever reveal anyone's personal secret?

TIME PLACE AND CATEGORY BARS: (Exclusionary Phrases)

Prior to 2013…?

While working in your hometown…?

While living in…?

During the period 1980 to 2013…?

Between 1972 and 2013…?

While going through school…?
Since working at…?

Before your last birthday…?

While in high school…?

Before…?

Prior to coming to…?

Between the ages of 12 and 18…?

OTHER EXCLUSIONARY PHRASES:

Not connected with this case…?

Not connected with this issue…?

Not regarding (victim's name), did you ever …?

Not including this issue…?

Excluding this issue…?

Without regard to (victim's name), did you ever …….?

CHAPTER THIRTEEN

TEST DATA ANALYSIS (NCCA)

The physiological recordings which comprise a psychophysiological detection of deception (PDD) examination are addressed in this section.

Breathing, electrodermal activity, cardiovascular, and finger pulse amplitude are the four currently accepted physiological responses monitored to assess truth or deception.

Many examiners (and the Board of Directors recommends) use of a motion sensor as an aid to detect physical countermeasure attempts.

The AAPP Board of Directors recommends using the seven-position scale when numerically assigning values during CQT data analysis.

(The three-position scale simply assigns a +/1 if the CQ component being compared is stronger or weaker (respectively) than that of the RQ to which is it being compared. Equal reactions are scored a 0.

The AAPP Board of Directors does not recommend using the three-position scale.)

The seven-position numerical evaluation procedures are used to evaluate comparison question formats.

The responses to the relevant questions are compared to the responses at the comparison questions.

For the seven-position scale, numerical values ranging from plus three (+ 3) to minus three (- 3) are assigned to each independent physiological tracing at each relevant test question position.

Seven Position Scale:

Relevant				Comparison		
-3	-2	-1	0	+1	+2	+3

Positive values are assigned when the CQ reaction (green zone) is greater than the RQ to which it is being compared (red zone):

+1 assigned when comparison question responses are Subtly Greater
+2 assigned when comparison responses are Obviously Greater
+3 assigned when comparison responses are Dramatically Greater

Negative values are assigned when the RQ (red zone) is greater than the CQ reaction (green zone) to which it is being compared:
-1 assigned when relevant question responses are Subtly Greater

-2 assigned when relevant responses are Obviously Greater
-3 assigned when relevant responses are Dramatically Greater

Zero scores are assigned when there is little or no difference between the RQ and CQ(s) being compared:

0 assigned when comparison & relevant responses are the same
0 assigned when comparison & relevant responses are non-existent

Only data that is timely and free of artifacts and unwanted noise on the signal of interest can be scored.

Not all test data is evaluated. If unwanted noise, an artifact, or homeostatic change occurs at the time of an applied stimulus or within the scoring window, the assignment of a score may not be appropriate.

A question spacing of 25 seconds from (RQ and CQ) question onset should be maintained throughout the examination.

Only empirically validated scoring procedures – or those scoring procedures taught at AAPP recognized schools of polygraph – should be utilized to evaluate test data.

Chart Notations.

The AAPP Board of Directors recommends that a Chart Legend be placed uniformly on every analog chart in the upper left-hand corner with the following information:

First name, middle initial and last name of examinee
Test number and examiner's initials
Time and date of test
File Number

Example:
Linda J. Quinonez
I - 1 dmr
1430 31 Jul 06
06 - 1 - 124

On analog instrument generated charts, notations regarding adjustments, distortions, and examiner errors should be placed next to the tracing that was most affected.

On computerized instrument generated charts, notations regarding adjustments, distortions, and examiner errors will automatically or semi-manually be placed, according to the written instructions of the program software. For standardization purposes, examiners using analog instruments should consider placing all notations above the pneumograph tracing. Computerized instruments, depending on manufacturer, place notations automatically in various locations on the chart.

All instructions to the examinee are placed in a timely manner on the chart to indicate the time the instruction took place (in the same manner as stimulus marks).

Following are alphabetically listed analog chart notations recommended by the AAPP Board of Directors:

Answering Instructions (A I)
Belch (B)
Breathing Instructions (B I)
Cleared Throat (C T)
Cough (C)
Coughing (extended period) (C--C)
Deep Breath (D B)
Disregard Reaction (\ \)
Examiner Error (E E)
Ink Skip (Analog Instrument with clogged pen) (I S)
Laughing (L)
Laughing (extended period) (L--L)
Movement (M)
Movement (extended period) (M--M)
Movement (observed) (M) (Arm)
Moving Instructions (MI)
Noise (inside the suite) (ISN)
Noise (outside the suite) (OSN)
Paper Jam (Analog Instrument) (P J)
Pen Jam (Analog Instrument) (PN J)
Poorly worded question (P W)
Repeated Question (R)
Sigh (S I)
Sleeping (S P - S P)
Sneeze (S Z)
Sniff (S N)
Swallow (S W)
Talking (T)
Talking (extended period) (T - T)
Talking Instructions (T I)
Wake Up (W U)
Will Repeat Question (W R)
Yawn (Y)

The following definitions apply in test data analysis procedures:

Artifact - a change in physiological pattern not attributable to stimulus or homeostatic changes.

Average - that part of any one of the tracings that may be described as average during the chart analysis which is free of reaction, relief, and distortion.

Cardio Tracing - the recorded reproduction of the examinee's relative blood pressure and pulse rate.

Chart - (also called a polygram) a length of graph paper containing a complete record of the examinee's recorded physiological responses to a series of questions asked while the polygraph instrument (computerized or analog) is activated, with the following minimum recording parameters:

- upper and lower pneumograph (pneumo/respiratory) tracing
- electrodermal activity
- cardiovascular (cardio) tracing

Examination: those procedures that take place between the time the examinee initially signs the Polygraph Consent Form and the time he or she is dismissed, consisting of a pretest interview, in-test operations, and posttest interview or interrogation, as appropriate.

Electrodermal Tracing: the recorded reproduction of either skin resistance or skin conductance obtained through exosomatic recording.

Pneumo Tracing: the recorded reproduction of the examinee's breathing pattern.

Polygraph Examination Series: a polygraph examination constructed and administered in accordance with AAPP or APA recognized polygraph techniques in which a minimum of two polygrams are collected. However, the AAPP Board of Directors recommends the collection of at least three charts.

Reaction: response to a stimulus.

Relief/Compensation: a deviation in any one of the tracings attributable to physiological phenomena occurring after reaction or a distortion as compensatory action.

Spot Analysis: the separate evaluation of each tracing in each chart by comparing relevant (red zone) to control (green zone) questions at designated spots.

Tracing Purity: general character of the tracing. A "pure" tracing is a hypothetical tracing that is free of distortion, reaction, and compensation.

Upon completion of a polygraph examination, the examiner is required to provide a conclusion about the examination. The optimal result is a conclusion of No Deception Indicated (NDI) or Deception Indicated (DI).

There are instances when a conclusion of NDI or DI cannot be made. In those instances, the examiner must decide whether to…

- continue with the testing procedures.

- delay the examination.

- attempt to resolve issues apparently causing concern to the examinee, with the intention of repeating the test.

NDI opinions are based upon evaluating the charts and determining reactions to the CQs were consistently more salient than those of the RQs, which is determined by scoring the charts as described above.

DI conclusion are reached when the evaluation of the polygraph charts indicates the RQs were consistently more salient than the CQs (again, by scoring the charts as described above), and no other logical cause for such reactions can be found or resolved through further interview or testing (as necessary).

A No Opinion conclusion is reached when the examination has begun but cannot be completed for some reason (prior to an NDI or DI call). No Opinion conclusions can result if…

- the examinee has medical, psychological, or personal problems precluding polygraph testing.

- the examinee exhibits unusual reactions that cause distortion on the charts which cannot be resolved.

- the examiner terminates the testing process prior to completion.

An "inconclusive" opinion generally applies to a question or a series of questions within an examination; it indicates a determination of NDI or DI was not reached and that further testing is required to complete the examination.

If additional testing does not provide sufficient information to justify a determination of NDI or DI, the final result is identified as “No Opinion” (NO) rather than Inconclusive (INC).

Other general factors in test data analysis also include the practice of “Conspecnificance,” which means that the overall data collected should reflect…

- Consistent significant responses throughout the examination in either the RQs or CQs
- Systematized responses, meaning reactions that are specific and significant, occurring in at least two of the three tracings (viewing both pneumos as essentially one tracing) in at least two of the three charts. (If four charts are conducted, then three of four charts must contain systematized responses.) “Optimal systemized” responses are those in which reactions occur in all tracings concurrently.

Current NCCA Evaluation criteria and considerations:

In June of 2006, the DoDPI changed its scoring criteria (and since then has changed its name twice – from DACA to NCCA). NCCA now teaches only those individual tracing features that have been shown (through scientific research) to correlate with deception. While there may be additional features manifested by *some* individuals (known as "idiosyncratic" responses that are consistently displayed by the examinee throughout the examination), only those features that reliably occur during deception are considered for scoring purposes (except for clearly-identifiable idiosyncratic responders).

NCCA teaches both three-position and seven-position scoring; however, the details of seven-position scoring will be discussed here. In the three-position system, equal reactions (or no reactions) receive a score of 0. If the CQ has the stronger reaction a +1 is assigned; if the RQ has the stronger reaction, then a -1 is assigned. The benefit is less subjectivity on the part of the scorer. The cost is a greater number tests with scores that don't reach the standard decision thresholds (+/-6). (NCCA does not teach, but research has shown, that when using the three-position system, cut-off scores of +/-4 yield error and inconclusive rates comparable to those of the seven-position system using the standard +/-6 cut-offs.)

Pneumograph:

The pneumograph pattern consists of inhalation and exhalation strokes with normal amplitude from ½ to 1 inch with ¾ inch designated as ideal. The normal cyclic rate is 13 to 18 breaths per minute. This may vary due to a person's physical condition and/or physical build.

Pneumo tracing scoring criteria:

- There is one primary scoring feature: Respiration Line Length*
  - There is one secondary feature: Temporary Baseline Increase

➢ *Respiration Line-Length (RLL) Features:
  - Suppression (decrease in amplitude)
  - Apnea (blocking (not holding) – the ultimate form of suppression)
  - Slowing of Rate (Bradypnea)
  - Change in Inhalation / Exhalation (I/E) Ratio

➢ Non-RLL Feature
  - Temporary Baseline Rise (and return)

Explanation: All but the temporary baseline rise are captured by observing (or measuring) line length, i.e., the shorter that line-length, the greater the reaction.

RLL is the primary scoring feature. To determine which reaction is greater, visually picture how long the breathing tracings would be (in each of the two questions being compared) if the tracings were straight. If one can be readily identified (visually) as being shorter than the other, then it gets the point. To determine which pneumos to use for scoring purposes, identify the greatest reaction

(shortest line) in either the upper or lower pneumo of each of the questions being compared. Then, compare that pneumo channel with the corresponding (upper or lower) pneumo in the question to which it is being compared, assigning a score as appropriate. For example, if the RLL in the lower pneumo in the CQ is the shortest (and therefore the greatest response), compare it to the lower pneumo in the RQ even if the RQ's upper pneumo tracing is stronger than its lower pneumo.

Scores of -1, 0, and +1 are most common. Scores of +/-2 are seldom assigned but can be justified. Scores of +/-3 could also be justified, but they are very rare. (See below.)

Generally speaking, if the difference in the questions being compared is *subtle*, then a score of +/-1 is assigned; if the difference is *obvious*, a +/-2 is assigned; if *dramatic*, a +/-3 is assigned.

- When one of the reactions has <u>at least twice as much</u> response as the question to which it is being compared, then a score of more than +/-1 is justified because the difference is at least obvious (and perhaps dramatic).
- When one question has <u>no response</u> and the question to which it's being compared has a <u>response of at least eight seconds</u>, then a score of more than +/-1 is justified because the difference is at least obvious (and perhaps dramatic).
- When one question has <u>more than one diagnostic feature</u> (i.e., greater RLL and a temporary baseline increase), a score of more than one is justified.
- When the questions being compared have equal (or no) RLL responses but one has a temporary baseline increase (a non-RLL response) of at least <u>twice the response duration</u> of the other question's temporary baseline increase response, then a score of more than +/-1 is justified.
- One Cycle of Something is Nothing Principle:
    - Generally, more than one cycle of deviation from homeostasis is necessary before concluding the deviation to be a true reaction and worthy of consideration.

(Visually) equal reactions (or a lack of reaction in each of the questions being compared) results in a score of zero (0).

<u>Scoring windows for RLL</u>:

NCCA does NOT have a set scoring window for determining RLL reactions. Instead, it can be different for each set of questions being compared (i.e., each spot). In order to understand how to appropriately score RLL reactions, one must understand the following principles and terminology:

<u>RESPONSE ONSET</u>: The point at which a scoreable <u>reaction</u> starts.

<u>RESPONSE ONSET WINDOW</u>: The response onset window for each of the two breathing channels is from stimulus onset to one complete breath after the examinee's answer.

<u>DEFAULT TIME WINDOW / WINDOW OF EVALUATION</u>: The length of time each RLL response is to be considered. The window is not static, but rather determined as follows:

- Determine which (of either the RQ or CQ(s)) has the longest response duration.
    - The response must start within the RESPONSE ONSET WINDOW.

- The duration of the longest response (RESPONSE ONSET to the completion of the reaction) becomes the default time window. For example, if the RQ's RLL response is five seconds long and the CQ to which it is being compared is 10 seconds long, then the default time window (or window of evaluation) is 10 seconds for both questions.
  - The scoring window for each question starts at that question's RESPONSE ONSET and continues to the end of the DEFAULT TIME WINDOW / WINDOW OF EVALUATION.
    - For example, if the CQ's 10-second response starts five seconds after the question starts (but before the first full breath after the answer as it must begin in the RESPONSE ONSET WINDOW), then the window of evaluation begins there, and it ends 10 seconds out – at the 15-second mark (where the reaction stops). The 10-second window of evaluation (the DEFAULT TIME WINDOW in this example) begins at the beginning of the RQ's RESPONSE ONSET (wherever that occurs within the RESPONSE ONSET WINDOW) and continues for 10 seconds. That means that if, for example, the RQ's response starts two seconds after the question starts, then you would consider from that two-second point out to the 12-second point (in order to score the entire 10-second DEFAULT TIME WINDOW).
  - Realize that this means the window of evaluation for one question (the RQ in the above example) may contain relief in addition to the reaction (whereas the other question contains only a reaction). That doesn't matter. Both windows of evaluation must be equal in length (of time), and the longer (duration) reaction dictates the time frame.
- The window of evaluation may include all or only a portion of the applicable response window.

Electrodermal Activity (EDA):

A normal EDA pattern is a relatively horizontal tracing across the chart.

The sensitivity has been properly adjusted when the examinee shows an upward response of at least 1" in amplitude.

The response onset window for the EDA channel is from stimulus onset to the examinee's answer.

EDA Scoring Criteria:

- There is one primary feature: AMPLITUDE INCREASE
  - There are two secondary features: DURATION and COMPLEXITY

Determining scores for the questions being compared:

Amplitude increase:

- At least a 4:1 ratio = +/-3
- At least a 3:1 ratio (but less than 4:1) = +/-2
- At least a 2:1 ratio (but less than 3:1) = +/-1

- Bigger is better principle: If the ratio is not 2:1, but one question's EDA response is visually larger than the other, then the larger response receives the point (+/-1). No more than a +/-1 is allowed. (Use the above ratios to determine scores greater than +/-1.)
- Something verses nothing principle: When one question has no response and the question to which it is being compared does have a response, then the question with the response receives the score by counting standard chart divisions as follows:
  - Less than two chart divisions = +/-1
  - At least two chart divisions, but less than three chart divisions = +/-2
  - At least three or more chart divisions = +/-3

When the questions being compared have amplitude increases that are (essentially) visually equal (i.e. scores that would otherwise be assigned a zero), then the following rules are employed:

- The question with visually longer duration receives the point (=/-1).
- or the question with complexity receives the point (=/-1).
  - A complex response is one in which the tracing has multiple peaks. Once the recovery side of the EDA tracing returns to the (pre-stimulus) baseline level, then the reaction is considered complete, i.e. no further rises are considered to be part of the same (complex) response.

All others result in a score of 0.

NOTE:

1. Neither complexity nor duration trumps or neutralizes amplitude.
2. Once a ratio of a least 2:1 is achieved, neither complexity nor duration is considered.
3. Duration is never a factor when comparing a complex response to a non-complex response as a complex response generally will have more duration than a non-complex response.
4. A conservative approach is taken when a response appears to be an anomaly, which means the examiner has the discretion to cautiously and uniformly assign a lower score in such situations.

Cardiosphygmograph:

The contraction and relaxation of the heart enable the polygraph to record the systolic stroke, the diastolic stroke, and the dicrotic notch (which appears in the diastolic stroke) as well as relative blood volume/pressure and changes within.

The dicrotic notch is a slight increase in blood flow caused by the closing of the semi-lunar valve in the left ventricle, which prevents the blood from re-entering the heart after it has been forced into the aorta. Normal cardio tracings have slight variations, depending on the emotional and physical state of the examinee.

The cardiosphygmograph pattern consists of systolic and diastolic strokes with normal amplitude from ½ to 1 inch with "1" designated as optimal. The normal cyclic rate is 72 heartbeats per minute. This may vary due to a person's physical condition and/or physical build.

The response onset window for the cardio channel is from stimulus onset to the examinee's answer.

Cardio Scoring Criteria:

- There is one primary feature: AMPLITUDE (baseline) INCREASE
    - There is secondary feature: DURATION

Determining scores for the questions being compared:

Amplitude increase:

- At least a 3:1 ratio = +/-3
- At least a 2:1 ratio (but less than 3:1) = +/-2
- At least a visually greater response (but less than 2:1) (bigger is better principle) = +/-1
    - Something verses nothing principle: When one question has no response and the question to which it is being compared does have a response, then the question with the response receives the score by counting standard chart divisions as follows:
        - Less than two chart divisions = +/-1
        - At least two chart divisions, but less than three chart divisions = +/-2
        - At least three or more chart divisions = +/-3

When the questions being compared have amplitude increases that are (essentially) visually equal (i.e. scores that would otherwise be assigned a zero), then the following rule is employed:

- The question with visually longer duration receives the point (=/-1).
    - If one question returns to baseline, but the other rises and establishes a new baseline, then duration is not considered.

Additional Considerations when Scoring the EDA and Cardio Channels:

When a specific response is observed in the cardio or EDA tracing, the examiner must check the pneumo tracing to see whether the deviation was caused by a change in the subject's breathing. Such compensatory changes come in many forms:

- increase or decrease in blood pressure caused by a deep breath
- decrease in blood pressure caused by a deep breath or sigh
- change in the galvanograph tracing caused by a deep breath
- no change in other components subsequent to a deep breath
- the "vagus roll" effect (respiratory-blood pressure fluctuations)

  In identifying the vagus effect, the examiner must be able to identify a true vagus pattern.

This is a cyclic pattern that appears in the cardio or EDA tracing when aligned with the pneumo tracing; each inhalation produces a temporary rise in the cardio or EDA due to a change in the oxygen level of the blood.

The vagus effect is usually consistent in the cardio tracing, but not necessarily in the EDA.

The vagus effect may also lead to a change in the action of the lungs as the body compensates for the constriction of the blood vessels. This change in lung action may appear in the pneumo tracing as an increase in rate or, more commonly, as an increase in volume.

If you have no confidence that a particular reaction was the result of a sympathetic response to the stimulus (the question), but rather some other influence or activity (e.g. excessive noise, artifact, etc.), then assign a value of Ø (zero with a line through it).

CURRENT RESEARCH SUMMARY

Recent research has indicated that only twelve (12) specific indicators of deception are consistently supported by physiological and psychophysiological studies (also see chapter on Utah tests):

Pneumograph:	Slowed breathing (bradypnea) (Respiration Line Length – RLL)
Pneumograph:	Change in I/E ratio (RLL)
Pneumograph:	Suppression (RLL)
Pneumograph:	Apnea (blocking) (RLL)
Pneumograph:	Baseline arousal (baseline change or loss upwards, NEVER downwards) (RLL reactions always win over baseline arousal)
Electrodermal:	Vertical rise
Electrodermal:	Complex Response (only as a "tie-breaker" with similar amplitudes)
Electrodermal:	Duration (only as a "tie-breaker" with similar amplitudes)
Cardiosphygmograph:	Increased blood volume/pressure (baseline arousal)
Cardiosphygmograph:	Duration of reaction (only as a "tie-breaker" with similar changes is pressure/volume baseline arousal amplitudes)
Cardiosphygmograph:	Slowed pulse rate
Finger Pulse Amplitude (Vasomotor Activity):	Reduction of Pulse Amplitude (or duration even with similar changes in amplitude reduction)
General (Idiosyncratic):	Any change that may occur with consistency on a particular channel or on RQs and/or CQs. *e.g.*, "vagus roll" ("respiratory-blood pressure fluctuation" is the proper terminology) disappears with consistency on certain questions or question types. Use of this is not universal, but unique to the individual, and must be demonstrably associated with deception on the examinee's part. If applied generally, may reduce accuracy. (the examiner must be prepared to defend such changes as idiosyncratic reactions.)

References:

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CHAPTER FOURTEEN

EMPIRICAL SCORING SYSTEM (ESS)

10. Definitions.

    1. Empirical Scoring System (ESS): an evidence-based model for test data analysis (TDA) of psychophysiological detection of deception (PDD) examination data from comparison question techniques (CQT). The ESS is based on decades of scientific studies by multiple groups of PDD researchers. (See Appendix A.)[1]

        1. The ESS is premised on a requirement that all aspects and assumptions of a TDA model must to be supported by evidence in the form of published scientific studies.

        2. Categorical decisions based on ESS results are made using a statistical decision model in which the numerical grand-total and sub-total scores are interpreted by calculating the level of significance, using normative data from confirmed truthful and deceptive cases.

    2. Significant: A categorical interpretation of a test or experimental result as meaningful (statistically significant) when the calculated probability of error (p-value) is less than the stated tolerance for error (alpha).

        1. P-values correspond to numerical scores, while alpha levels correspond to decision thresholds (cut scores).

        2. Numerical scores of greater absolute value (further from zero) indicate a more significant result, and correspond to p-values (probabilities of error) that are closer to zero.

11. Theory: PDD responses are measured as changes in physiological activity. These changes occur in response to psychological stimuli presented in the form of test questions that describe the examinees behavioral involvement in the issue under investigation, along with other test questions intended to facilitate the administration and scoring of the test.

    1. Psychology: The examinee will tend to show greater physiological responses to the test stimuli that are more salient when subjected to multiple presentations of reviewed test stimulus questions that describe the examinee's behavioral involvement in the issue of concern. Deceptive examinees will tend to show greater reactions to relevant questions, truthful examinees to comparison questions.

        1. Salience is a feature of emotion (including combinations of such states as fear, anger, sadness, joy, disgust, etc.), cognition (including attention, problem solving,

[1] This standard guide will summarize the information pertaining to the ESS, but will not attempt to describe the validation studies. The reader is directed to the reference list for an introduction to the published literature.

memory, information processing and cognitive effort), and behavioral conditioning (including single trial conditioning resulting from behavioral involvement in the issue under investigation, learning or other conditioning events).

2. The purpose of the pretest interview will be to desensitize reactions of a truthful examinee to relevant questions through a thoughtful and non-accusatory free-narrative discussion of the details of the behavioral concern. The same interview and discussion of detail will serve to sensitize the deceptive examinee to the issue of deception and to eliminate other causes for reaction.

2. Physiology: The physiology of primary interest to PDD examiners includes the brain, integumentary system, heart, lungs, diaphragm, abdominal muscles, intercostal muscles, and other skeletal muscles. PDD examination data is primarily based on the autonomic nervous system, and also include information from behavioral functions.

1. Brain: consumes oxygen and glycogen at a rate that is higher than and disproportionate to that of other organs. Activity in the brain will increase as a function of increasing cognitive, attentional, emotional, and regulatory activity. Increased workload demands in the brain can be expected to result in predictable changes activity in related physiological systems (i.e., cardiovascular system, respiratory system, autonomic nervous system).

1. Pre-frontal cortex: plays a role in attention, concentration, memory, judgment, problem solving, emotional regulation and all executive functions.

2. Cerebral cortex: including prefrontal cortex and other lobes, plays a role in memory encoding, storage and retrieval for information and acquired knowledge.

3. Amygdala: considered to be the alarm center of the brain.

4. Thalamus: sometimes called the anteroom, is responsible for filtering incoming sensory signals (with the exception of olfactory information) and routing information to associated parts of the brain.

5. Hypothalamus: a small olive-sized collection of nuclei located below the thalamus, responsible for regulating circadian, reproductive, and homeostatic functions including respiration temperature, sweating and other functions.

6. Hippocampus: involved in formation of emotions and the storage and retrieval of long term memories from the cerebral cortex.

7. Cerebellum: regulates and controls coordinated muscle functions. Also maintains basal muscular tonus, which can be monitor via PDD components that are sensitive to skeletal muscle activity and compared to distinct changes indicative of voluntary behavior during testing.

8. Medulla oblongata: located at the lower part of the brainstem, plays a role in basic cardiovascular and respiratory functions.

2. Integumentary system (skin): largest organ in the body, contains eccrine and appocrine sweat glands. Eccrine sweat glands are densely located on the palms, soles and other areas and are innervated by acetylcholine, which can be monitored during PDD testing as a general indicator of changes in the level sympathetic/autonomic activity that occur as a result of activity in the brain.

3. Cardiovascular system: Includes the heart muscle, arteries, capillaries, and veins. One of the primary purposes of the cardiovascular system is to transport nutrients and oxygen to body tissues and remove metabolic wastes and carbon dioxide from the body tissues. In polygraphy, we are primarily concerned with observing changes that occur in the heart muscle and blood vessels. Cardiovascular activity during PDD testing will increase in response to workload demands in the brain, autonomic nervous system, or skeletal muscles.

4. Respiratory system: Including the lungs, intercostal muscles, diaphragm and abdominal muscles. The primary function of the respiratory system is to supply the cells of the body with oxygen and to vacate the body of carbon dioxide. Breathing describes the collective actions that move air into and out of the lungs. Breathing inhibition is found to be a reliable indicator of arousal during polygraph testing.

3. Physical activity during PDD testing, whether voluntary or involuntary, may or may not preclude interpretation of the PDD data. PDD data that are impaired by voluntary or involuntary movement should not be scored. Observed movements, events or artifacts, whether voluntary or involuntary, should not be scored or interpreted for their differential salience, but may be independently evaluated to determine the statistical probability that they occurred randomly or were due to a strategic effort to alter the examination result.

4. Test Theory: All tests are fundamentally a matter of stimulus and response, and are administered by presenting a stimulus and measuring or observing the response. All measurements are estimates of the actual value of whatever is being measured or tested, and include both signal (data) and noise (uncontrolled variance).

1. Test accuracy is accomplished by presenting a test stimulus multiple times, and aggregating the observation or measurements together. [2]

2. Scientific tests (hypothesis tests) are based on the calculation[3] that an observed test result occurred due to random chance or uncontrolled factors (null hypothesis) and

[2] The highest levels of PDD test accuracy are accomplished through the presentation of multiple iterations of multiple test stimulus questions that describe a single behavioral concern. In this way multiple observations or measurements of a single behavioral concern can be aggregated to achieve a more accurate and reliable test result.

[3] ESS calculations are based on the z-value of the area under the curve when the observed composite reaction score (i.e., pneumograph, electrodermal and cardiograph scores) are standardized using the normative parameters (i.e., mean and standard deviation) for confirmed deceptive and confirmed truthful cases.

not on the theoretical or assumed cause (hypothesis).

3. Truthful and deceptive examinees can generally be expected to respond differentially to target and comparison stimuli, and to produce two different normative distributions of scores.

4. Normative distributions can be used to calculate the statistical probability that an individual examination result belongs to the truthful or deceptive normative distributions.

5. PDD results are accomplished by making categorical interpretations of truthfulness or deception, when the numerical test results, indicative of the differential salience of relevant and comparison stimuli, are equal to or exceed the stated requirements for statistical significance (i.e., the p-value is less than or equal to alpha).

12. Global analysis: Test data analysis should begin with a global analysis of the overall quality and quantity of the recorded physiological data.

1. Inspect the data for the general quality and sufficient quantity of physiological responses.

2. Inspect the data for indicators of behavioral non-cooperation, attention and response to the test stimuli, timeliness of reactions, artifacts, voluntary and involuntary movements, physiological responses to stimuli that may be external to the examination, and artifacts or events may affect one or more physiological channels.

3. Inspect the pre-stimulus segment of all test questions, and do not score reactions occurring in response to questions presented during artifacted or unstable segments.

13. Physiological signals (scoring features) are included in the ESS as a result of their empirical correlation with the criterion categories of truthfulness and deception in the CQT paradigm.

1. Respiratory features (suppression): Two pneumograph sensors are used. The upper pneumograph sensor should be placed to monitor breathing movement activity in the thoracic intercostal muscles. The lower pneumograph sensor should be placed to monitor breathing movement activity in the abdominal area including the diaphragm and abdominal muscles.

1. Suppression of breathing movement amplitude for at least three respiratory cycles beginning after the stimulus onset and following a stable pre-stimulus pattern.

2. Slowing of breathing rate for at least three respiratory cycles beginning after the stimulus onset and following a stable pre-stimulus pattern.

3. Temporary increase in exhalation baseline for at least three respiratory cycles beginning after the stimulus onset (considered less important than suppression or

slowing) and following a stable pre-stimulus pattern.

4. Apnea can be intentionally created by the examinee and should be scored only if it occurs at a relevant question.

2. Electrodermal Activity (EDA) is measured as the amplitude of vertical increase from the lowest point following the stimulus onset until the end of the reaction. Electrodermal sensors can be placed on the fingertips, over the thenar and hypothenar eminence (palms) or other area where a suitable response can be obtained.

3. Cardiograph response data is measured as the amplitude of vertical increase when viewing the diastolic portion of the waveform. Response is measured from the lowest point following the stimulus onset until the end of the reaction. Do not score unstable or artifacted cardiograph data. Cardiograph data is recorded at the brachial artery, using non-occlusive pressure. Alternate locations for the cardiograph sensor are the forearm or lower leg.

4. Movement sensor data is not scored for the criterion of deception or truthfulness but may be scored for the statistical probability that movement activity occurred due to random activity or a strategic effort to alter the test result.

14. Transformations (scoring rules) are procedures used to assign numerical values to observed physiological reactions and aggregate the numerical values into sub-total and grand total scores. ESS transformations are non-parametric, with no assumptions about linearity or distribution shape of the physiological response data.

1. Compare the strength of reaction to the relevant stimuli with the strength of reaction to the comparison stimuli and assign three position scores (+1, 0, -1) for each physiological sensor using the *bigger-is-better* rule when there is any visibly discernible difference in the magnitude or intensity of physiological response.

1. Assign positive (+) scores when there is a larger response to the comparison stimuli.

2. Assign negative (-) scores when there is a larger response to the relevant stimuli.

3. Double all EDA scores (i.e., +2 or -2) regardless of the magnitude of difference in physiological response.[4] Scores of 0 (zero) scores remain 0 (zero).

4. Assign a single score to the combined upper and lower pneumograph by observing the reaction features in the combined pneumograph sensors. Assign a positive (+)

[4] ESS is fundamentally an evidence-based 3-position scoring model. The major differences between ESS and traditional 3-position scoring are 1) the use of primary physiological reaction features for which there is replicated empirical support, 2) the use of empirically developed decision rules, and 3) use of normative data to calculate statistically optimal cutscores, and 4) the weighting of EDA scores in consideration of the volume of research and statistical data suggesting that EDA data accounts for a structural contribution of approximately ½ of the final test result. Doubling EDA scores results in a significant increase in test sensitivity, along with a significant decrease in inconclusive results, with no loss of test specificity.

score when the combined reaction is stronger at the investigation target stimulus. Assign a negative (-) score when the combined reaction is stronger at the comparison stimulus.

2. Score only those reactions that are timely with the stimulus.

    1. Observed reactions should be interpreted as caused by the stimulus when then begin after the stimulus onset and within 5 seconds after the stimulus offset or answer.

    2. Score EDA and cardiograph reactions to the end of the reaction.

    3. Do not score reactions that begin before the stimulus onset[5].

3. Score only data of normal response magnitude and normal interpretable quality (e.g., global assessment).

    1. Do not score artifacted reactions such as deep breaths, movements or other events not attributable to the test stimuli. Reactions that are concurrent with but not affected by deep breaths or artifact activity may be scored.

    2. Do not score unstable reaction segments, non-specific reactions, or physiological data that is not within normal parameters (e.g., abnormally slow or very fast breathing).

15. Decision rules are used to interpret the numerical scores according to operational goals and cut scores that are selected for a required level of statistical significance or test sensitivity. Interpretation is the process of translating numerical test results into useful human language and categorical decisions.

    1. Grand Total Rule: Sum all scores for all questions to calculate a grand total score, representative of the test as a whole. Sub-total scores are not used with the Grand Total Rule.

        1. If the grand total is less than or equal to (≤) the required cutscore for a statistically deceptive result then the correct interpretation is Deception Indicated (DI).

        2. If the grand total is greater than or equal to (≥) the required cutscore for a statistically significant truthful result, then the correct interpretation is No Deception Indicated (NDI).

        3. If the grand total is neither less than nor equal to (≤) the required cutscore for a deceptive result, and neither greater than nor equal to (≥) the required cutscore for a truthful result, then the correct interpretation is Inconclusive (INC) or No Opinion (NO).

[5] EDA response latency requirements have been described as .5 seconds after the stimulus onset. Cardiograph latency requirements have not been described in empirical studies.

2. Spot-Score Rule (multiple-issue screening exams): Calculate the sub-total scores, summing all the scores for each investigation target question. The grand total score is not used with the Spot-Score Rule.

    1. If ***all*** sub-total scores are greater than or equal to (≥) the required cutscore for a statistically significant truthful result, then the correct interpretation is NSR for the test as a whole[6].

        1. Individual sub-total scores that are greater than or equal to (≥) the required cutscore for a statistically significant truthful result may be interpreted and reported as NSR for the sub-total score and corresponding test question.

    2. If ***any*** sub-total score is less than or equal to (≤) the required cutscore for a statistically significant deceptive result, then the correct interpretation is SR for the test as a whole.

        1. Any sub-total score that is less than or equal to (≤) the required cutscore for a statistically significant deceptive result should be interpreted and reported as SR for the sub-total score and corresponding test question.

        2. All sub-total scores that are ***not*** less than or equal to (≤) the required cutscore for a statistically significant deceptive result should be interpreted and reported as INC or NO. Do ***not*** interpret the results of some sub-totals as SR and others as NSR within a single examination.

    3. When the test as a whole cannot be interpreted as SR or NSR, the overall test results should be interpreted as INC or NO, such as when one or more but not all of the sub-total scores are greater than or equal to (≥) the required cutscore for a statistically significant truthful result, while none of the sub-totals is less than or equal to (≤) the required cutscore for a statistically significant deceptive result. Individual sub-total scores that do not meet or exceed the cut score for truthful or deceptive result should be interpreted and reported as INC or NO.

3. Two-Stage Rules function as the ***sequential*** use of the Grand Total Rule and Spot Score Rules, and provide the optimal solution for most investigative and diagnostic exams, with increased sensitivity and decreased inconclusives when compared to the Grand Total Rule. Test results should be interpreted and reported at the level of the ***test-as-a-whole.*** However, the scored and interpreted results of individual questions may also be reported. Do ***not*** interpret the results of some sub-totals as DI or SR and others as NDI or NSR within a single examination.

    1. Stage One: grand total only.

[6] The only unequivocal truthful result, when using the Spot-Score Rule, is when the examinee produces a statistically significant truthful score to each of the investigation target questions.

1. Sum all scores for all questions to calculate a grand-total score, representative of the test as a whole. Sub-total scores are not used with the Grand Total Rule.

    1. If the grand-total is less than or equal to (≤) the required cutscore for a statistically significant deceptive result then the correct interpretation is DI. Do *not* proceed to Stage two.

    2. If the grand total is greater than or equal to (≥) the required cutscore for a statistically significant truthful result, then the correct interpretation is NDI. Do *not* proceed to Stage two.

    3. Proceed to Stage two if the grand total is inconclusive (i.e., is neither less than less than or equal to (≤) the required cutscore for a deceptive result, nor greater than or equal to (≥) the required cutscore for a truthful result).

2. Stage Two: sub-total Scores.[7]

    1. If *any* sub-total score is less than or equal to (≤) the required cutscore for a statistically significant deceptive result, then the correct interpretation is DI for the test as a whole.

    2. If none of the sub-total scores is less than or equal to (≤) the required cutscore for a statistically significant deceptive result, then the correct interpretation is INC or NO.

    3. There is no solution to achieve a NDI result at stage two.

4. The Traditional ZCT Rule[8] functions as the *simultaneous* use of the Grand Total Rule and Spot-Score Rule[9]. Test results should be interpreted and reported at the level of the *test-as-a-whole*, and the scored and interpreted results of individual questions may also be reported. Do *not* interpret the results of some sub-totals as SR and others as NSR within a single examination.

    1. If the grand total is less than or equal to (≤) the required cutscore for a statistically deceptive result then the correct interpretation is DI.

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[7] Stage two involves the comparison of the sub-total scores with the distribution of *total* scores. The empirical question is thus: "Is one of the subtotals performing the function of the total score, and providing the correct examination result?" In contrast, when applying the spot scoring rule when applied to multiple issue exams the subtotal score is compared to the distribution of *sub-total* scores. The result of this important distinction will be that the statistically optimal cutscore for sub-total scores of single-issue exams (including multi-facet exams) is further from zero than the sub-total cutscores for multiple issue exams. This will, at first, seem counterintuitive to field examiners not trained in statistical decision theory.

[8] Cut scores can be easily mistaken for decision rules but are distinct. Decision rules are the operational procedure, which can be executed using different cut scores for different test performance.

[9] Use of this traditional decision rule will result in a statistically significant increase in false-positive errors and inconclusive results among truthful examinees. ESS is designed to manage false-negative errors without causing a significant increase in false-positive errors or inconclusives, by allowing for the selection of an alpha cutscore for truthful results that will provide the desired level of precision.

2. If *any* sub-total score is less than or equal to (≤) the required cutscore for a statistically significant deceptive result, then the correct interpretation is DI for the test as a whole.

3. If the grand total is greater than or equal to (≥) the required cutscore for a statistically significant truthful result *and* all of the sub-total scores are greater than zero (> 0), then the correct interpretation is NDI.

16. Normative cut scores.[10]

1. Diagnostic exams (two-stage and grand total decision rules)

1. Cut scores for three-question ZCT exams[11] (See Appendix B for normative lookup data for three -question ZCT exams. Appendix C contains validation and test accuracy data for ZCT exams.)

1. Three-question ZCT grand total ≥ +2 = NDI/NSR ($a < .10$)

2. Three-question ZCT grand total ≤ -4 = DI/SR ($a < .05$)

3. *Any* three-question ZCT sub-total ≤ -7 = DI/SR (Bonferonni corrected $a < .017 * 3 = .05$)

2. Cutscores for two-question ZCT exams (a.k.a,You-Phase or BiZone) exams. (See Appendix D for normative lookup data for two-question ZCT exams.)

1. Two-question ZCT grand total ≥ +2 = NDI/NSR ($a < .10$)

2. Two-question ZCT grand total ≤ -4 = DI/SR ($a < .05$)

3. *Any* two-question ZCT sub-total ≤ -6 = DI/SR (Bonferonni corrected $a < .025 * 2 = .05$)

2. Cutscores for Multiple-issue screening exams with two, three or four investigation targets. (Spot-Score Rule). (See Appendix E for normative lookup data for two-question ZCT exams.)

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[10] Monte Carlo Norms have been developed for all types of CQT exams in use in field and laboratory settings, including event-specific ZCT exams of all types, with two and three questions, multi-facet investigative examinations using MGQT formats of all types, and multi-issue screening exams based on MGQT (including LEPET, LEAT screening exams) or DLST techniques used in government security screening, public safety screening, and post-conviction screening.

[11] Cutscores for all types of CQT exams can be selected for a required level of precision or tolerance for error. For example: inconclusive results can be reduced by selecting a greater tolerance for error. Or, errors can be reduced by selecting a cutscore with a smaller alpha value, at a cost of some increase in inconclusive results. Traditional cut scores are not based on normative data or statistical theory. While traditional cutscores can be used with the ESS, their effectiveness will not conform to the accuracy profile shown in Appendix C. Refer to Appendix B, D to determine the level of statistical significance and probability of error for traditional and other cutscores.

1. *All* multiple issue sub-total scores ≥ +1 = NSR (1-Šidák corrected *alpha* < .10)

2. *Any* sub-total scores ≤ -3 = SR (*a* < .05, no correction)

3. Sub-total variability: 90% of sub-total scores will vary less than 7 points (i.e., 6 points or less) with three-question and two-question ZCT exams (combined truthful and deceptive normative data). Less than 10% of all examinations can be expected to produce differences of seven points or more between sub-total scores.[12]

4. Non-positive sub-totals: more than 50% of truthful cases can be expected to result in one or more sub-total scores that are non-positive (i.e., zero or negative scores).[13]

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[12] Conservative judgment would suggest to interpret a test result as Inconclusive or No Opinion when the data produce scores that are unusual or outside normal limits, such as when there is a 7 point or greater difference between the sub-total scores of a two-question or three-question ZCT exam.

[13] A requirement that all sub-totals results in a positive integer score will produce a condition in which the results of more than 50% of all truthful examinees cannot be interpreted as truthful.

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Appendix A

Normative Lookup Data for ZCT Exams

Mean deceptive score = -9 (SD = 8)

Mean truthful score = 8 (SD = 7)

ZCT Truthful (NSR) Cut-scores	
Total NDI/NSR Cut-score	p-value (alpha)
-1	0.159
0	0.130
1	0.106
2	0.085
3	0.067
4	0.052
5	0.040
6	0.030
7	0.023
8	0.017
9	0.012
10	0.008
11	0.006
12	0.004
13	0.003
14	0.002
15	0.001
ZCT Deceptive (SR) Cut-scores	
Total DI/SR Cut-score	p-value (alpha)
1	0.159
0	0.127
-1	0.099
-2	0.077
-3	0.058
-4	0.043
-5	0.032
-6	0.023
-7	0.016
-8	0.011
-9	0.008
-10	0.005
-11	0.003
-12	0.002
-13	0.001

Appendix B

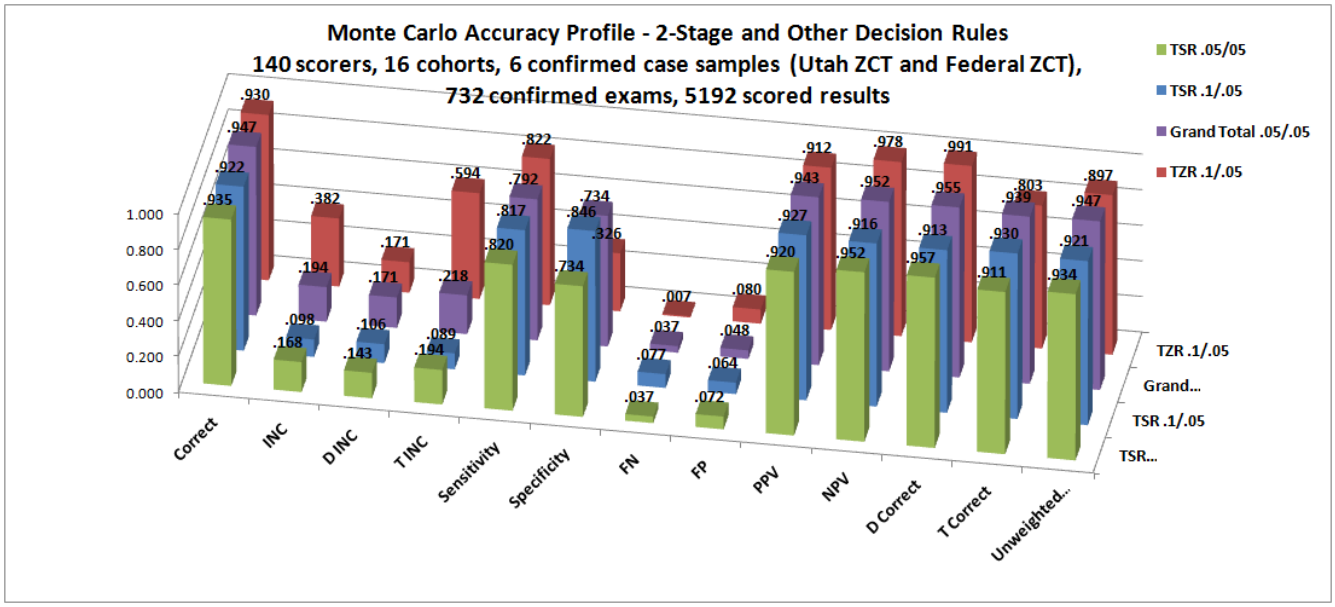
Monte Carlo Validation: Accuracy Profile of ESS with Confirmed ZCT Field Examinations

17. Bootstrap Monte Carlo 100 exams and 10,000 iterations, seeded with the subtotal scores of N = 5192 confirmed three-question ZCT examinations (Utah ZCT and Federal ZCT techniques), collected from 16 cohorts of scorers (including experienced examiners, inexperienced trainees, international examiner trainees, and non-examiner psychologists), who scored 6 different confirmed case samples. Table C-1 and Figure C-1 show the Monte Carlo accuracy profile for ESS results using four different decision models.

Table C-1. Monte Carlo accuracy profile for ZCT examinations.

Decision Rules for ZCT Examinations Mean, (Standard Deviation) {95% CI}				
	Two-stage Rules	Traditional ZCT Rules	Two-stage .05/.05	Grand Total .05/.05
Correct	.922 (.028) {.867 to .977}	.93 (.032) {.867 to .993}	.935 (.027) {.882 to .987}	.947 (.025) {.899 to .996}
INC	.098 (.030) {.04 to .156}	.382 (.048) {.288 to .477}	.168 (.037) {.095 to .242}	.194 (.039) {.117 to .272}
D INC	.106 (.044) {.02 to .192}	.171 (.053) {.067 to .276}	.143 (.050) {.046 to .24}	.171 (.054) {.066 to .276}
T INC	.089 (.041) {.01 to .169}	.594 (.070) {.457 to .731}	.194 (.056) {.084 to .304}	.218 (.058) {.104 to .333}
Sensitivity	.817 (.055) {.709 to .924}	.822 (.054) {.715 to .928}	.82 (.054) {.713 to .927}	.792 (.058) {.679 to .905}
Specificity	.846 (.051) {.747 to .946}	.326 (.067) {.195 to .457}	.734 (.063) {.612 to .857}	.734 (.063) {.612 to .857}
FN	.077 (.038) {.003 to .152}	.007 (.012) {<.001 to .031}	.037 (.027) {<.001 to .089}	.037 (.027) {<.001 to .089}
FP	.064 (.034) {<.001 to .132}	.08 (.038) {.005 to .154}	.072 (.036) {.001 to .143}	.048 (.030) {<.001 to .107}
PPV	.927 (.039) {.852 to >.999}	.912 (.042) {.830 to .993}	.92 (.040) {.841 to .998}	.943 (.035) {.874 to 1.013}
NPV	.916 (.041) {.835 to .997}	.978 (.037) {.906 to >.999}	.952 (.035) {.884 to >.999}	.952 (.035) {.884 to >.999}
D Correct	.913 (.042) {.831 to .996}	.991 (.015) {.962 to >.999}	.957 (.031) {.896 to >.999}	.955 (.032) {.892 to >.999}
T Correct	.930 (.038) {.856 to >.999}	.803 (.089) {.629 to .978}	.911 (.045) {.823 to .999}	.939 (.038) {.864 to >.999}
Unweighted Average	.921 (.028) {.866 to .977}	.897 (.045) {.809 to .986}	.934 (.027) {.881 to .987}	.947 (.025) {.898 to .996}

Figure C-1. Monte Carlo accuracy profile for three-question ZCT results with 4 different decision models.



Appendix C

Normative Lookup Data for Two-question ZCT Exams

Mean deceptive score = -6 (SD = 6)

Mean truthful score = 6 (SD = 6)

Two-question ZCT Truthful (NSR) Cut-scores	
Total NDI/NSR Cut-score	p-value (alpha)
-1	0.202
0	0.159
1	0.122
2	0.091
3	0.067
4	0.048
5	0.033
6	0.023
7	0.015
8	0.010
9	0.006
10	0.004
11	0.002
12	0.001
Two-question ZCT Deceptive (SR) Cut-scores	
Total DI/SR Cut-score	p-value (alpha)
1	0.202
0	0.159
-1	0.122
-2	0.091
-3	0.067
-4	0.048
-5	0.033
-6	0.023
-7	0.015
-8	0.010
-9	0.006
-10	0.004
-11	0.002
-12	0.001

Appendix D

Normative Lookup Data for Multiple-Issue Exams

Mean deceptive score = -2 (SD = 3)

Mean truthful score = 2 (SD = 3)

Multiple-Issue Deceptive (SR) Cut-scores		
SR Cut-score	p-value (alpha)	
0	0.252	
-1	0.159	
-2	0.091	
-3	0.048	
-4	0.023	
-5	0.010	
-6	0.004	
-7	0.001	
Multiple-Issue Screening - Alpha 4 RQs		
NSR Cut-score (4RQs)	Uncorrected Alpha	Observed Alpha
0	0.252	0.070
1	0.159	0.042
2	0.091	0.024
3	0.048	0.012
4	0.023	0.006
5	0.010	0.002
6	0.004	0.001
Multiple-Issue Screening - Alpha 4 RQs		
NSR Cut-score (3RQs)	Uncorrected Alpha	Observed Alpha
0	0.252	0.092
1	0.159	0.056
2	0.091	0.031
3	0.048	0.016
4	0.023	0.008
5	0.010	0.003
6	0.004	0.001
Multiple-Issue Screening - Alpha 4 RQs		
NSR Cut-score (2RQs)	Uncorrected Alpha	Observed Alpha
0	0.252	0.135
1	0.159	0.083

2	0.091	0.047
3	0.048	0.024
4	0.023	0.011
5	0.010	0.005
6	0.004	0.002
7	0.001	0.001

CHAPTER FIFTEEN

PAIRED TESTING & EVIDENTIARY SCORING RULES

The American Society of Testing and Materials (ASTM International) approved a "Paired Testing" (Marin Protocol) standard for evidentiary exams in which the veracity of two opposing witnesses – with conflicting accounts in which at least one must be lying – are subject to polygraph exams by examiners certified in paired-testing. Certification requires an examiner prove his or her ability to score charts correctly at least 86% of the time, and that he or she knows how to conduct a valid exam (i.e., an exam that is supported by research and found to be at least 90% accurate).

The 86% figure is based on the NAS study concluding that is the average accuracy of single-issue tests. The base rate problem (that argues little confidence should be put into a CQT because the base rate in most testing situations is unknown) is alleviated in that the tests are conducted when at least one party must be lying (and found DI) and one must be truthful (and found NDI), making the effective base rate 50%. (If both are found DI or NDI, then the polygraph evidence wouldn't be used.)

If each party is tested on his or her account and one examiner finds subject A to be DI, and the second ("blind") examiner finds subject B to be NDI, then the chance of error (when a certified paired-testing examiner conducts each test) is less than two percent. That is, the chance that both examiners would be wrong is less than two percent. (If each is 86% accurate, then each has a 14% chance of error (100 – 86 = 14). The chance of them both being wrong is the product of each examiner's chance of error. Thus, the error rate equals 14% of 14%, or 0.14 X 0.14, which equals 0.0196 – almost 2 %.)

Research has shown that traditional scoring rules (as described earlier) employed on a Federal three-RQ ZCT often result in unbalanced accuracies, i.e., they better identify deception than truthfulness. Moreover, examiners tend to make more inconclusive / no opinion decisions on the truthful than on do they on the untruthful, resulting in an apparent bias of polygraph against the truthful. Additionally, the CQT opponents argue that no confidence should be placed in a stand-alone CQT because accuracy is meaningless (so they say) without knowing the base rate. In investigative situations where the cost of false positives is less than the cost of false negatives, traditional scoring rules make good sense.

However, for evidentiary (e.g., courtroom) applications, a more balanced approach is necessary. That is, a scoring system that identifies the deceptive and truthful at about equal rates is essential. The following scoring rules have been shown to achieve that desired balanced accuracy, reducing the number of false positives and the number of NO calls on truthful examinees:

EVIDENTIARY SCORING DECISION RULES:

Evidentiary decisions rules utilize a two-stage process:

First, all spot totals are tallied for one grand total.

A total score of +4 or greater is NDI.

A score of -6 or less is DI.

Individual spot scores are not considered at this point. In other words, even if R7 is -3, but the total score of all three spots is +4 (or greater), then the call is NDI.

IF the overall total is greater than -6 and less than +4, then spot totals are considered:

If any spot total is -3 or less, then the call is DI.

All other scores result in a NO conclusion.

NOTE: Even though Evidentiary Decision Rules resulted in more balanced accuracies, they do result in a very moderate, but statistically significant INCREASE in FALSE NEGATIVES. Therefore, they are not appropriate for all situations. Examiners must weigh the costs and benefits before employing these decision rules. (Keep in mind that Paired testing protocols require those examiners holding paired-testing certification to adhere to these scoring rules in certain situations.)

References:

ASTM (2005). E2324-04 Standard Guide for PDD Paired Testing. ASTM International.

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CHAPTER SIXTEEN

SCREENING EXAMINATIONS

Currently the AAPP does NOT have any standards for conducting screening exams. The AAPP is actively researching the topic and expects to adopt such standards in the future. However, our members should be aware that ASTM International has adopted standards, and all examiners would be wise to follow those standards as they are the only national/worldwide standards on screening exams available at this time. (See Chapter one, PDD Ethics and Standards of Practice, to learn how ASTM International standards apply to AAPP members.)

As previously stated, ASTM International standards are copyrighted; therefore, the following is only a highlight of *some* of the ASTM International standards outlined in its protocol:

- Standard polygraph protocols (e.g., professionalism, objectivity, determining examinee suitability, question formulation, etc.) should be adhered to as they would be in any other PDD testing situation.
- Examiners should only utilize testing techniques in which they have formal training and have maintained competency.
- No more than five (5) relevant questions should be presented during any single test (chart).
- Calls of deception should not be made based solely on the results of a multi-issue screening exam as such examines are inherently less accurate than other available testing techniques.
- If an examinee exhibits SRs to any screening exam questions, those questions should be further probed through interview and additional testing as necessary.
- Calls of DI should only be made AFTER conducting a single-issue CQT on the issue resulting in SR during the screening exam.
- Those utilizing polygraph results should be informed that hiring decisions should not be based solely on the physiological reactions of an examinee during a PDD exam.

Additionally, research shows that polygraph has high sensitivity (*e.g.*, it is good at detecting deception) but low specificity (*e.g.*, it is not as good at identifying the issue to which one is being deceptive). As a result, when running a screening exam it is possible for a person to react significantly, for example, to R4 but actually be deceptive to R1. A breakout exam on R4 (running a single-issue CQT) should clear that issue, but R1 would be missed if testing ended there. As a result, the NCCA recommends (but ASTM International does not yet require) that after a successful single-issue breakout test, the screening exam be run again (called a "clearing" test) – minus the relevant question tested in the single-issue test. Testing is complete when all issues are cleared with NSR or NDI findings (if that is the case) or when a DI call (or confession) is made on a single-issue test as would be expected on the issue of R1 in the example. Also, see "successive hurdles" in the "Best Practices" chapter.

For example, assume an examinee reacts significantly and consistently to R3 in a screening exam covering four relevant issues (R1, R2, R3, and R4). He denies lying during the post-test

interview. A breakout, single-issue test is then run on R3, which results in an NDI call. To make sure no issues were missed (due to the specificity problem), the remaining relevant questions (R1, R2, and R4) should be run again (as a screening exam) in the "clearing test." If all are cleared, then the call is NSR or NDI. If there are SRs, testing continues until either all issues are cleared or a DI (or confession) or NO call is made.

The LEPET – Law Enforcement Pre-Employment Test, as taught by NCCA, is a format that was developed from the Air Force Modified General Questions test. This test format is taught frequently at seminars as well as in many basic polygraph training school programs. This format, like many of its modifications, employs the use of a comprehensive, pre-test questionnaire booklet that covers all aspects of the Examinee's background. Depending upon how the booklet is used, it serves as a very cost-effective screening tool since many Examinees, after completing (or just scanning through it), will realize that they cannot pass a law enforcement polygraph screening test and simply refrain from appearing for the examination. The LEPET test that many law enforcement agencies is the three or four-spot Version 1 of the AFMGQT or the three or four spot of the AFMGQT Version 2. You will find these in Chapter 7 of this book.

Another screening test format that is being taught at many seminars and is presented in polygraph journals is the Directed Lie Screening Test which has been designed to provide the polygraphist with an effective way to conduct screening tests using a comparison questions technique that contains safeguards against commonly-publicized and commonly-taught countermeasures that are available over the internet. Currently, research is being conducted to quantify the validity and reliability of these utility type examinations.

References:

ASTM (2004). E2229-02 Standard Guide for the Conduct of PDD Screening Examinations. ASTM International

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CHAPTER SEVENTEEN

COUNTERMEASURES (CM)

People generally tend to do whatever they can to keep from embarrassing themselves. In our business, we must be ever alert that some people will not want us to know the whole truth and will often try to "beat the polygraph."

This subject matter is extremely sensitive and the information is to help examiners better cope with countermeasures by knowing how to counter the countermeasures. The key information to remember is that an Examinee can "create" artificial responses to the comparison questions, but they **cannot** suppress natural reactions to the relevant questions.

A non-user of CMs will have timely and consistent responses in both of the RQs and CQs. The user of CMs will usually have untimely, inconsistent, distorted, and/or responses that would not be physiologically possible in a human being. Expect to be confronted with an individual who will attempt to defeat the polygraph test through conscious and deliberate actions. Examinees may attempt to create responses, which they hope will cause the examiner to render a non-deceptive, or at least an inconclusive opinion. The research indicates that a lying subject could be diagnosed as truthful.

A current trend seems to be developing are examinees who intend to use countermeasures are **not** using them to try to create greater responses on the comparison questions that the relevant questions in order to "beat" the test. They are, however, attempting to create artifacts in the tracings so that valid scoring cannot be completed, and will use the "excuse" (to whomever will accept it) that they are just "untestable;" *e.g.*, "I tried, but it just wouldn't work right with me."

Countermeasures range from sophisticated, subtle mental disorienting techniques to the crude, easily recognized movement of various limbs on the person's body, to the examinee taking two aspirin with a caffeinated drink before coming in for his/her test.

Polygraph countermeasures are deliberate techniques which a deceptive subject will use in an attempt to appear innocent when his/her physiological functions are being recorded and monitored during a polygraph examination.

Mental Countermeasures are attempts by the subject taking the polygraph examination, to control his / -her mental state in order to control the outcome of the test. The following is a discussion of the more common types of mental countermeasures.

Dissociation:

The subject may attempt to completely ignore the content of the question and try to answer automatically in response to the sound of the polygraphist's voice.

Usually this is only possible with a test in which the answer to each question is always the same, such as in a Peak of Tension Test.

Dissociation capitalizes upon this inherent weakness by allowing subjects to focus attention upon some irrelevant object or thought, such as counting the number of holes in a square of soundproofing on the wall.
The mind is totally involved in a monotonous, non-exciting task, thereby allow-ing the subject to ignore the question content and automatically answer no.

We tend to believe that dissociation can be effective only where all the answers are the same, such as "NO," or if the examinee could somehow memorize the order of the question sequence and concentrate on the sequence of yes and no answers. Simple, basic pretest and in-test procedures can assure that question recognition must be present to ensure appropriate answers, and when this is properly done, application of the dissociation countermeasure could well be rendered ineffective.

Countering the Dissociation Countermeasure:

Have the examinee repeat a key word from the question along with his no answer. *e.g.*;

"Steal - NO!"

"Shoot - NO!"

"Stab - NO!"

Mix up the question order on Chart 2 and subsequent charts to preclude pattern recognition. The polygraphist may choose to mix up just the comparisons, just the relevants, or both.

Randomly insert irrelevant questions!

Use irrelevant questions that have both yes and no answers.

Advise the examinee up front that there is no specific order for the questions.

Watch for the examinee who seems detached from where he really is.

Watch for the examinee that answers too slowly or too quickly.

Watch for the examinee that answers all questions in a subdued voice and in exactly the same tone of voice.

Rationalization:

If the examinee can convince him/herself that the question you are asking simply does not pertain to him/her and he/she believes that rationalization, then we could have not only an effective countermeasure but also an effective ego defense mechanism as well.
We must be careful at this point to assure ourselves that the subject initially realized that the question did apply to him/her and he has subsequently sought to evade the issue by rationalizing and thus employing a countermeasure.

Countering rationalization might be one of the more difficult countermeasures since it might be impossible for us to determine when it is being employed.

We recommend routine semantic consideration during the pretest interview and careful question formulation. Consider:

Could the examinee have committed the offense and still answered the question truthfully?

The polygraphist should anticipate possible rationalizations and then word the test questions accordingly.

Sometimes, have the examinee explain exactly what his/her understanding of the question is. Have him/her express in his/her own words what she/he thinks the question includes and what it means - If there is a potential problem, reword the question.

Stimulating thoughts:

This is a major type of mental countermeasure, which is used to generate responses to questions other than the relevant questions.

We would imagine that the examinee would resort to erotic imagery while exercising his/her stimulating thoughts and think hard about sexual experiences or fantasize about a sexual act he or she wishes they had experienced.

Countering the "stimulating thought" countermeasure:

This could also be a difficult countermeasure to counter, since it might be impossible to determine when it is being employed. If a polygraphist suspects that the examinee is attempting countermeasures with this method, it is recommended:

You consider using the Irrelevant / Relevant testing technique.

If comparison questions are used, introduce them in such a convincing manner that the examinee will not know that they are comparison questions.

Sometimes by telling the examinee that the Irrelevant Questions are Known Truth Questions the examinee will automatically be led to believe the irrelevants are in fact Comparison/Control Questions and that the Comparison/Control questions are in fact relevant.

The technique of applying this countermeasure in a comparison question test, if the examinee is well trained, could be difficult to detect. It seems as though, in our experience, that even a trained examiner will often display anticipation in the pneumograph recordings and you will display "early" responses.

Meditation:

Meditation is a form of inward turning yoga, modified for use by the layman in his everyday life. Deep yoga practices are much too difficult for the average person and are correctly practiced only by persons who devote their lives to them.

Meditation or transcendental meditation is designed to bring the benefits of meditative or inward turning yoga to everyone, regardless of age or occupation.

In all the various forms of meditation, the person trains him/herself to achieve and maintain a very calm and stable state, both physiologically and psychologically.

This is accomplished by assuming a comfortable seated position, and concentrating on some internal phenomenon.

This may be a sound the person generates in his head.

It might be a spot they imagine inside their head.

It could be a breath control exercise with visualization of movement of the air in and out of the lungs.

It might be counting inside the head, visualizing a bird and many other possible activities.

The important point is that the attention is concentrated on this one internal phenomenon and the person becomes increasingly proficient through practice.

When the person becomes highly proficient at this meditative practice, the person ends up in a state in which he is awake, and all of his senses are functioning, but all sensory inputs are prevented from reaching consciousness or awareness.

This person's mind is totally focused on the internal phenomenon.

This person has no awareness of the external environment and does not have any interest in the external environment.

This person may not be able to hear, see, or move.

People who become moderately proficient, but who do not reach the state just described will experience various degrees of withdrawal from external reality, will have reduced awareness of sensory phenomena, and will become to various degrees, indifferent to their environment.

How to recognize a person who is in a meditative state.

The person will often sit unnaturally still, yet will appear very relaxed about it, once he/she is in the examination chair and the examination begins. By this definition and description it is obviously impossible for an examinee to practice meditation during the pretest portion of the examination.

The person will tend not to hear the questions, leading to slow and/or indecisive answers or no answers at all. To what degree this happens will depend on the person's degree of meditative proficiency.

Once in the state, to any degree, the person will tend to seem indifferent toward his surroundings.

Is meditation an effective countermeasure to the polygraph technique?

After researching this, the AAPP Board of Directors tends to believe that meditation is a poor countermeasure and should cause the capable examiner few if any problems in conducting the examination, because:

It is normally easy to recognize a person attempting meditation.

It takes several minutes to get into this state, even with very proficient persons. There is no instantaneous movement into or out of this state.

A person deeply into the state will not hear your questions, and his body will not respond.

Meditation will tend to produce flat charts, even where there is not complete withdrawal, because the examinee is not aroused to anything. Thus, there will be no differential between control and relevant questions, which in itself should be a flag that something is wrong.

Extremely few mediators will be able to seriously enter the meditative state under the force of the stresses of the polygraph examination situation.

Most people who claim to be meditating are just sitting still with their eyes closed, trying to think of nothing. This is quite different from the true meditative state.

These people can still hear you and if the pretest has been effective, will still respond.

Hypnosis:

Hypnosis is a well-publicized, very controversial and widely misunderstood mental countermeasure.

Not only is the general public confused, but also the experts themselves differ drastically as to what it is and how to define it.

The AAPP Board of Directors believes that hypnosis is a condition or state of consciousness that can be artificially induced and is characterized by marked susceptibility to suggestion and loss of sensation.

It is obviously within the realm of mental countermeasures, yet there are certain aspects which tend to put it into a separate category.

According to some experts, the few studies dealing with hypnosis as a possible countermeasure are largely plagued with serious methodological weaknesses.

Some literature suggests that hypnosis might be employed by instructing the examinee, through hypnosis:

To totally relax on all of the polygraph questions.

To totally relax on only the relevant issue questions.

To have total amnesia pertaining to the issue being tested.

To express response or anxiety on all comparison questions.

We have learned, and it is on the Internet teaching inquiring minds, of certain hypnotic instructions. We have listed some of them below that are advertised and purported to work.

"When the examiner states, the test is about to begin, you will automatically go deep into hypnosis and follow all of the instructions that were given to you here today".

"You will go deeper and deeper relaxed as the polygraph examiner attaches each instrument component to your body, and when you are completely attached to the instrument, you will be completely and deeply relaxed, in a deep state of hypnosis and will follow all of the instructions which were suggested to you here today".

"Amnesia for the entire incident will take place when the polygraph examiner attaches any device or component to your body".

"You will immediately forget everything about the issue being tested, when the polygraph examiner attaches any device to your body".

"You will automatically return to a fully wakened state when the polygraph examiner tells you that the test is over".

As discussed immediately above, hypnosis will most likely take the form of *post*-hypnotically suggested amnesia with regard to the specific incident or a given period of time. Some studies will lead one to believe this works while others will lead to the conclusion that it does not work

In any event, it should become apparent during a well-conducted pretest interview that there is something amiss due to the examinee's reactions during conversation.

However, beyond that reasonable assumption, there may or may not be evidence to suggest that the hypnosis procedure may well be ineffective anyway.

There are studies wherein subjects committed mock crimes and then were subjected to hypnotically suggested amnesia for all events in a seven-day period (covering their mock crimes). These subjects were then examined by polygraph and their involvement in the mock crimes were detected by polygraph. The items stolen were located by searching peak of tension tests.

Posthypnotic manipulation of arousal levels is, however, a possibility.

Consider a specific issue examination in which time/location bars will be used in the comparison/control questions. Assuming the examinee is familiar with or has been trained in the comparison / control question technique, post hypnotic arousal at key words likely to be in control questions could be a possibility, because:

Did you... is typically used on relevant questions.

Are you the kind of person..

Prior to....

Before....

are typically used on comparison/control questions.

The Board of Directors has no information that this has ever been done, but it could be something to think about.

Countering the Hypnosis Countermeasure.

Look for the examinee that appears hypnotized!

Look for a tendency to stare fixedly.

Look for a lethargic appearance.

Look for a demeanor suggesting examinee is physically here, but mentally somewhere else.

Look for a relaxed state, accompanied by exaggerated, slow breathing.

Look for a delay in answering questions.

Look for the answering of questions in a soft tone of voice, which is different than in the pre-test interview.

Take a break, walk the examinee around and observe. If you deem it necessary, bring his/her condition to his/her attention.

Consider telling him/her that he/she does not look right or normal, advise the examinee that this demeanor might have an adverse effect on the examination.

Have the examinee repeat key words during the testing sequence to ensure you that the examinee is intellectually aware of the question content.

BioFeedback:

There are studies that report people who have undergone biofeedback training are able to suppress autonomic nervous system functions of the body in the areas of the galvanic skin response, pulse rate and probably the Cardio Activity Monitor or perhaps a PLE.

The literature suggests that biofeedback is essentially the use of sensing devices to pick up changes in one's physiological processes, which can then be displayed, or fed back, either visually or auditorially to the person from whom they are being taken.

We are advised that essentially biofeedback helps the person learn what physically or psychologically affects their response capability.

In this case, timeliness would be a counter countermeasure in this particular event. Polygraph professionals proficient in identifying countermeasures are not aware of anyone who is able to create and then suppress these nervous system activities within 25 seconds of each other.

The Hypnotherapist Certification Board of California, which purports to be a private professional examining body, sells a GSR Biofeedback System to provide a person with immediate knowledge of an internal bodily process, i.e. heart rate, breathing, perspiration and body temperature and how to learn how to control those processes.

Their "machine" is allegedly used in stress reduction, pain alleviation and as an induction method to achieve hypnosis.

They claim it is the only fully integrated, portable system available, putting body and stress control in the "palm of your hand", allowing "you'll monitor and control tension easily, anywhere".

Their GSR2 biofeedback system includes a handheld sensing plate unit, GSR finger probes, skin temperature sensors, visual meter, earphone for privacy and complete instructions.

At our last contact with this group, they were selling the unit for approximately $160.

Physical Countermeasures.

These require subtle manipulation of the body to create recordings which appear to be responses.

The AAPP is familiar with:

Tensing and relaxing (called "flexing" by some examiners) of the arm on which the cuff is located which can create responses in the cardio component. Also, be very wary of those who will flex the bicep on the arm the cuff is not on which will create artificial BP increases as well.

Voluntary contraction of the anal sphincter muscle;

Pressing toes against the floor;

Pressing thighs against the chair;

Crossing the eyes;

Squinting the eyes;

Gritting the teeth;

Pressing the tongue against the roof of the mouth; or

Pain;

Self-induced pain is crude, but effective, and relatively easy for the examinee to apply. It is difficult to detect if done subtly and with some degree of sophistication. It can include:

Tongue biting;

Having a sharp object in the mouth to press against; or

Concealing the proverbial ” tack in the shoe.” (However, just try and walk even a short distance, with a tack in your shoe, and you will see that it is not easy to do without being discovered.)

Countering the Pain Countermeasure:

Careful scrutiny of the examinee is essential and will often serve to detect self-induced pain measures, since at least minimal movement is necessary.

Tongue biting is sometimes discernible through jaw movement.

The examinee may attempt to overcome this by placing the tongue between his teeth at the beginning of the chart and keeping it there throughout the question sequence, eliminating the need to move the jaws.

The examiner can usually detect this by the lack of lip and jaw movement at the point of the answer and a somewhat different tonal and diction quality than that displayed by the examinee at other times.

A movement bar under the examinee's chair is recommended along with frontal observation or video recording of the examination maybe even simultaneously splitting the screen to show examinee and the chart.

Adrenal Exhaustion:

This is a term that traditionalists in polygraph have, in the past, referred to as a possible physical countermeasure. However, recent teachings in physiology classes of recognized schools of polygraph, assert that adrenal exhaustion does not effect a polygraph examination in any way.

Lynn Marcy reports to have conducted an examination on an individual who had his adrenal glands surgically removed as a result of a disease and the examination was successful.

Controlled Breathing:

Some examiners strongly believe in not ever mentioning the word “breathing” to an examinee.

Depending on the polygraph school you attended, pretest interview classes were taught according to the way the instructor had been taught. Consequently, some examiners believe you can talk about breathing and others do not. Doing it either way is acceptable since they will know breathing is recording if they read any of the numerous internet sites on polygraphy.

The AAPP Board of Directors collectively cannot recall having had this problem, consequently, we recommend that the individual examiner make his/her own determination based on experience.

There is a lot of controversy among polygraph examiners about whether or not this will draw the examinee’s attention to their breathing and create a breathing problem that we might not have otherwise encountered.

The normal rate of breathing is 13 -to 18 times per minute.

Controlled or altered breathing is a physical countermeasure, which can be detected by various methods, including administering a silent chart. Other ways will be described in this chapter.

Controlled breathing is not normal breathing. Examples are:

Rapid breathing;

Slow breathing (the most common method);

Deep breathing; or

Shallow breathing.

Countering Controlled Breathing.

With this Countermeasure, we recommend:

If controlled breathing is prevalent, stop the examination (as far as continued questioning and releasing pressure from the arm cuff, but continue to record the physiological data of the pneumographs and EDA), and advise the examinee not to talk to you or move about, but to listen carefully to you. During this period, you should see the breathing return to normal since the examinee will think that the testing has stopped briefly, and you can record their normal breathing patterns.

Then proceed to ask the person to cooperate by sitting still, listening to the question, answer the question, etc. Make "small talk," trying to limit any verbal responses from the examinee, for two minutes or so.

All this time, observe the individual's breathing by the movement of the chest assemblies. Additionally leave both pneumos operational and the kymograph running to record a true normal respiratory pattern. Compare this to earlier recordings and then continue. If this controlled breathing persists, confront the person head on and show him/her what is normal and what he was doing on the chart.

Remember that controlled breathing will normally be prevalent in both pneumos. If only one shows exaggerated tracings, the problem may well be operational (pneumo sensor placement) and not controlled breathing.

Chemical Countermeasures:

These are the subject of a great deal of controversy. The AAPP suggests that chemical ingestion to defeat a polygraph examination is somewhat ineffective for comparison question testing. We are unaware of any drug that can selectively suppress responses at relevant questions and increase them at comparison /control questions.

Chemical Counter-Countermeasures begin in the pretest interview.

Observe the physical characteristics of the examinee.
Ingestion of depressants, stimulants or hallucinogens in any substantial dose should manifest itself in predictable physical characteristics.

Stimulant type drugs (refer to your pharmacology class) usually result in faster respiration and pulse rate.

Depressant type drugs customarily result in decreased respiration and pulse rates. Some believe that decreased GSR amplitude can result from these type drugs.

Hallucinogenic drugs can result in erratic response patterns and perhaps inappropriate answers to questions.

Available literature on how to beat the polygraph:

There are volumes of articles available on how to beat the polygraph.

If a person has successfully created false negative responses in a previous examination, chances are good that the examinee will enter the examination room with the reinforced belief that he/she can successfully do it again.

Unfortunately, there are unscrupulous examiners who have attempted to condition a person to dissipate responses through habituation.

If someone is scheduled to take a police polygraph test, he might well contact an unscrupulous examiner and arrange to be tested for two or three days so as to condition himself for the testing procedures and the types of questions to expect in the upcomig examination.

Think back and remember the last test you took, and you knew which questions were comparisons/controls and which were relevants. This lends itself to the more you know, the more dangerous you are to yourself.

The AAPP Board of Directors suggests that examiners are the easiest people to test, because they know that the polygraph works.

We suggest that it is difficult to train a person to enhance responses at comparison/control questions and suppress responses to relevant questions. In attempting to respond differentially to the two categories of questions, it is necessary for the subject to pay close attention to each question, and then attempt one of the two opposing types of countermeasures. This is inherently incompatible with mental dissociation.

Popular published information available on polygraph countermeasures and anti-polygraph literature may be found (among many others) at the following sites:

www.polygraph.com ("How to Sting the Polygraph")

www.antipolygraph.org ("The Lie Behind the Lie Detector")

www.passapolygraph.com

www.stoppolygraph.com

www.nopolygraph.com

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And there are numerous others.

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