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### Contributors to this issue

Tuvya T. Amsel  
Richard O. Arther  
George Baranowski  
Gary F. Davis  
Steven Duncan  
Walt Goodson  
Mark Handler  
Lisa Jacocks  
Charles R. Jones  
Benjamin F. Malinowski  
Jamie McCloughan  
Raymond Nelson  
Patrick O’Burke  
Darryl Starks  
Lincoln M. Zoon

### Deadlines

This issue closed on November 28, 2015.

Deadline for January/February 2016 issue is January 29

### Submission of Articles

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President - Elect
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Vice President – Government
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vp-government@polygraph.org

Vice President – Private
Gary F. Davis
vp-private@polygraph.org

Vice President – Law Enforcement
Daniel Violette
vp-lawenforcement@polygraph.org

Director
George Baranowski
1912 E. US Hwy 20, Suite 202
Michigan City, IN  46360
directorbaranowski@polygraph.org

Director
Barry Cushman
109 Middle Street
Portland, ME 04101
E-mail: directorcushman@polygraph.org

Director
Donnie Dutton
directordutton@polygraph.org

Director
Jamie McCloughan
directormccloughan@polygraph.org

Director
Steve Duncan
directorduncan@polygraph.org

Ex Officio Members

National Office Manager
Lisa Jacocks
P.O. Box 8037
Chattanooga, TN  37414-0037
manager@polygraph.org

Treasurer
Chad Russell
treasurer@polygraph.org

General Counsel
111 S. Tejon St., Suite 545
Colorado Springs, CO 80903-2245
generalcounsel@polygraph.org

Editor-in-Chief
Mark Handler
editor@polygraph.org

Seminar Chair
Michael Gougler
seminarchair@polygraph.org

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Greetings APA members I would like to take this opportunity to welcome a new member to our editorial staff, Doctor Adam Park from Texas Department of Public Safety. He is joining our team as Associate Editor and he will be collaborating on reviewing submissions for the Polygraph Journal and the APA Magazine.

I would also like to thank all the Associate Editors for their help and time to ensure that we deliver content of quality to you, our membership, because our main goal is to provide you with more knowledge and help you to succeed to the current challenges.

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TOPICS

GREG FOURATT - Cabinet Secretary of NMDPS and Former Federal Prosecutor  
Polygraph Laws and Polygraph Cases of importance or interest in reference to admissibility in the NM courts –

MARK HANDLER - APA Editor, AAPP Research & Information Chair  
History of ESS w/workshop and practice scoring charts  
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Retired Lt. Jerry Franklin Shockley of the City of Alexandria Police Department passed away unexpectedly on November 18, 2015. He was born in Virginia on February 4, 1935 to Bonnie Wainwright Shockley and John Raymond Shockley. Jerry was married to and survived by his wife of 52 years, Bobbie as well as their daughter, Jeri Lynn Hoffman (Jeff) and three sons, Jeffrey Alan Shockley (Tonya), Randall Lee Shockley (Amy) and Bradley Shockley (Christine). His children blessed him with 8 grandchildren, Logan, Bailie, Conor, Emily, Cameron, Alex, Ashton and Reagan. His sister, Barbara Clawson (Bob) also survives him along with his brother, Waverly Shockley. He is also survived by many nieces and nephews. He will live in their hearts forever.

Jerry loved being a police officer, he served the City of Alexandria’s citizens for 21 years before he retired. He was known as a good guy who was looked up to by his peers. He was always good for a laugh and kept his co workers smiling. He was a man of integrity and honor. He served his country in the Navy prior to joining the police department where he excelled as a polygraph administrator. While working for the City of Alexandria he received many “Top Cop” awards including an award for being one of the top ten cops in the nation. Jerry at one time was on the cover of Parade magazine. He never let the attention go to his head. He was a huge believer in furthering his education and continued to do so throughout his life.

He was a member of the Alexandria Police Association as well as the City of Alexandria Retired Police, Fire and Sheriffs Association. He also held membership with the American Polygraph Association, Virginia Polygraph Association and the West Virginia Polygraph Association as well as the Kiwanis club. Jerry taught criminal justice at Northern Virginia Community College.
IN MEMORIAM
ROBERT W. CORMACK
AUGUST 30, 1934 - NOVEMBER 22, 2015

Robert W. Cormack, age 81; beloved husband of Beverly Cormack, nee Schroeder; loving father of Tom (Lori Pfeiffer) Cormack and Cynthia (Rocco) Lucafo; cherished grandfather of Nicholas and Meadow Lucafo; dear brother of Sue (Chuck) Dayton and brother-in-law of Bernie and Margo Schroeder.

Mr. Cormack was a member of the American Polygraph Association since 1967.
President’s Message

Walt Goodson

I am genuine in my commitment to the points addressed in the speech.

It is with great honor I serve as your APA President and humbling that you have placed your trust in me to move us forward. My objective is to not let you down. My plan for sustained progress involves the APA Board of Directors. I’m fortunate to work with a board of dedicated and selfless examiners that have enjoyed incredible success in law enforcement, government and the business world. It’s my responsibility to foster a collaborative effort of this abundant talent to find solutions with will make us better.

Recently I have received many positive comments from those who read or heard my speech in Chicago. A few negative ones too. I say to my critics, just because I’m as skinny as Abraham Lincoln doesn’t mean I can deliver a speech like him. In all seriousness, I am genuine in my commitment to the points addressed in the speech. Thus, in the coming year, you will see results in following areas:

1. Membership status: I am currently working with President-elect Patrick O’Burke, Director Gary Davis and some other smart people in finding ways to create incentives for earning college degrees, pursuing continuing education, and subjecting work products to quality assurance reviews. A second goal is to find an effective way to eliminate the “associate” member status without compromising our high standards or the integrity of the profession. The goal is to offer the membership an opportunity to vote on an alternative membership structure that accomplishes all of these objectives.
2. The diversity of training: At next year’s seminar in Baltimore, you will have the chance to attend a wider variety of training. The intent of this expanded curriculum is to improve our work products by focusing on the one aspect of a polygraph examination we too often forget – the polygraph examiner. So far, I have worked with Seminar Chair Mike Gougler to offer two courses that focus on the well-being and mental acuity of the examiner in the polygraph suite that will hopefully enhance examiner performance. Let’s face it, we can offer endless lectures regarding how to make the polygraph more scientifically valid; however, none of that matters when we don’t feel good, and we make human errors. Reducing these mistakes will be the focus of these courses. A secondary training goal is to continue to work toward offering quality APA regional training at a low cost. Continuing education is incredibly important; however, conferences are expensive to attend. I will work to find a solution to bridge this gap.

3. Marketing ourselves: Marketing and promotion of the polygraph for riches is not my interest. If you are in this profession for money I urge you to get out now because you are seeking wealth in the wrong place. If you instead measure success by helping others, then please continue reading because polygraph is a public safety tool. To accomplish public safety, we need to market our skill to those who pursue this noblest endeavor. Post-conviction sex offender testing has undoubtedly integrated polygraph into a system that protects the public like nothing thus far. Moreover, it complements
government’s limited resources by moving public safety endeavors to the private sector. The PCSOT model has enjoyed much success because it conforms to a model policy that creates a high level of integrity in this polygraph testing process. To further benefit from the success of this model, the next obvious step is to create additional model policies for post-conviction testing. Currently in the works is a model policy for Domestic Violence testing. It’s my hopes to get this policy quickly approved by the Board of Directors so that we can use it as a foundation for conducting polygraph testing in an additional area that protects unidentified victims. It’s my further hope that this policy will foster both training and discussions at the Baltimore seminar on strategies for expanding post-conviction testing.

4. Strategic Plan: Before I began my tenure as president, I submitted a document to the APA Board of Directors that outlined my vision for the coming year. Part of that vision was to create a five-year plan for the APA. The idea was a simple one; increase the strength of the APA by raising our educational standards and intelligently growing our membership. I’m very fortunate to have the experience of Director Donnie Dutton and President-elect O’Burke, who have taken my original plan and created a draft of a five-year strategic plan that will keep future boards moving toward a position of strength and education. My hopes are to publish that plan on the APA website as well as the next magazine.

5. Accountability: You elected us, so we owe you something. All committee chairs are now responsible for submitting quarterly reports so you will know what they and their committees are accomplishing. In the upcoming year, I hope to publish these reports. The first report was due at the end of November; however, I want to give board members a chance to grow into this reporting system before I had them published on the web. Board members can, of course, use the platform of this magazine to keep you up to date as they have historically done in the past.

As always, thanks for all you do to make this world a better place. Most importantly, I offer my best wishes for peace and joy this holiday season and a New Year of health, happiness and prosperity to you and your families.
The holiday season is rapidly approaching and should have arrived by the time you are reading this article. I want to wish you happiness and peace for the holiday and may God bless all of your travel and time with your families.

The new APA website is the premier location on the web for all information polygraph related. If you would like to see something there please let me or Mark Handler know so that we can explore your request. We are also planning to have our next year’s conference registration on the website, along with convenient credit card payment options. We hope that you are planning on attending in Baltimore. I hope that the APA’s new strategic plan will be there by the time you read this. I have been working diligently with President Walt Goodson on this recently drafted long term strategic plan. Walt has also tasked committee chairmen with cohesive work efforts that support the goals and objectives in the plan. The plan is a comprehensive forward looking effort to improve customer service for you, our trusted members, to focus on professional influence and raise educational standards.

These broad objectives are fully supported by clear action plans and efforts to produce measurable results. I believe that the Strategic Plan will be on the website by the time you read this article. Please read President Goodson’s message on what the Board is hoping to accomplish.

The new By Laws passed in Chicago also provided for a new membership category for Divisional Affiliates. This will allow polygraph associations that meet certain requirements to have a formal partnership with the APA in supporting professional and evidence based polygraph. The process has been formalized and we have an application and process prepared to distribute to associations that want to share in supporting best practices and ethical standards worldwide. Please contact me or the APA National Office for paperwork to start this process. The requirements for Divisional Affiliates are listed below.

- Divisional Affiliates are only those not for profit polygraph professional membership organizations or associations who desire a professional relationship with the APA and whose members agree to abide by the APA Code of Ethics and the APA Standards.
of Practice. No individual may claim APA membership as a result of being a member of a Divisional Affiliate. An applicant for Divisional Affiliate shall:

- Deliver a copy of its then current bylaws (or the equivalent thereto) to the APA and, if granted membership by the APA, immediately provide the APA with subsequent revised versions of such bylaws; and
- Be granted Divisional Affiliate status upon at least a two-thirds (2/3) vote of the Board of Directors at which a quorum is present.

I have also been collecting information on ectopic heartbeats and how they impact test data analysis. Ectopic heartbeats, or premature ventricular contractions (PVCs), or extrasystoles as they were called in my long ago training, have gone through several revisions of rules for numerical evaluation in evaluating physiological responses. I have been in discussion with several polygraph researchers and want to explore this issue. I would like to have some tests that are confirmed, if possible, that display both limited and chronic distributions of PVCs. I am particularly interested in charts that may show a correlation, or lack of correlation, to responses in other components such as the EDA.

If you have interesting charts with PVCs that you can share with me please get in touch. Just out of curiosity I am interested in how examiners would score this segment?

SEGMENT 001

What about this one? SEGMENT 002

Please send me an email or give me a call if you have something to share. Thanks and I hope to see you at a conference soon.

Gary F. Davis
VP Private

Time really flies not only as we grow older but in service to the APA. It seems like only yesterday I did the after seminar report. During the intervening time, I have been busy meeting with private members of the APA. I had the opportunity to attend the Kansas/Nebraska/Missouri Tri State Seminar in Branson, Missouri. This gathering of Private and Law Enforcement Examiners enjoyed presentations by Bob Heard and Ben Blalock. In addition each month I try to call each new private practice member and welcome them to the APA. I was surprised with the number of attendees who were not members of the APA. Most were members of not only their state association but the APA. The
most common reason for not belonging to both Associations was redundant. They saw no real benefit from dual membership.

During our discussions, we discussed the developments in Evidence-based Testing and Validate Techniques. I explained the APA is in the forefront of insuring members have all the latest research data and access to scientific support for what we do. After all our responsibility is to protect the innocent and identify the guilty. The more we know the better we do our job.

We all know polygraph is constantly under attack by the media and those who have little current information about the scientific basis for detection of deception. I remember a headline a few weeks ago “Polygraph didn’t work in 1951 and it doesn’t work today”. This is a common perception among many. The APA is working hard to improve the image of our profession. Not only do we provide members publications on research but we are developing presence on Facebook. For my small contribution, I search Redditt.com daily for questions and comments about polygraph. I answer questions and field inquiries whenever possible.

I am always looking for ways to support the APA and its members. If any member has questions or needs assistance, feel free to contact me. I can be reached at 866-535-8969 or through the APA web site. By the way if you haven’t visited the Web Site, take the time there is a wealth of information available to members including the new Standards of Practice.

Darryl Starks
VP Government

Well, it’s that time of year again! The leaves have fallen, the lawns have been mowed for the last time (for most of us), and the holiday decorations are going up. It’s a good time to “pump the breaks” a little, spend as much time as you possibly can with family and friends and reaffirm for ourselves what life is really all about (hint hint…it’s not work).

This year I am honored to serve as the General Chairman of the Communications and Public Relations Committee for the APA. Last year the committee worked diligently to update and improve the functionality of the APA website, to make it more user friendly for our members. As a frequent visitor to the website, I can attest to the successful accomplishment of that goal! I encourage ALL of you to use the website and more importantly, update your account information so the association has your
most up-to-date contact information. Now my friends, it’s time to consider expanding our methods of communication through media outlets such as Facebook, Twitter and LinkedIn. As you are well aware, these venues can give members “instant” information about what’s going on in the association and the world of polygraph. If you are social media savvy, I encourage you to consider serving as a volunteer of the Communications & Public Relations committee. Your expertise is greatly needed!

Seasons greeting to all of you. May you find peace and joy in all that you do.

George H. Baranowski
Director

LAW ENFORCEMENT, FEDERAL and GOVERNMENT EXAMINERS
STARTING A PRIVATE PRACTICE
AND KEEPING IT GOING

Like it or not, sooner or later, law enforcement examiners, federal examiners and government agency examiners someday retire, and some, like I did, will start to consider the possibilities of opening a civilian private practice. I receive calls for advice and inquiries about this all the time. Many in fact dream of starting their own business, but it is not as simple as it may seem. The cold hard facts are that Workman’s Compensation research indicates that law enforcement officers who have been forced to retire due to injuries or a medical problem, that attempt to open a private practice wash out within 18 months across the nation. The answer to why this occurs is simple. Most former law enforcement or government agent examiners know all about polygraph, all about the equipment, all about running a test, but they normally just don’t know how, or perhaps the better word is realizing that there’s no easy button you can push to start, manage, and especially keep a private practice going.

I have had a private practice for 25 years now, and I have to tell you, I learned many lessons the hard way about making this thing fly. Although we seldom admit it but when retiring from law enforcement or government agencies it’s perfectly normal to feel lost, and the fear of how to survive and support yourself and your family is all of sudden a reality.

Let me also make something clear that I am not the sole authority on Private Practice. In fact, stay away from anyone that tells you they are - they are dangerous. In addition, I am offering
information based on my experience that have worked for me, in my part of the world, in the Northern Midwest, here in the United States. As you know, the American Polygraph Association has members in countries all over the world and my exposure is obviously limited what I know about here in America, and what laws, restrictions etc. exist here in the United States. However, I also feel that anyone contemplating this new career can find some useful information in this discussion, regardless of his or her locality.

To start this discussion, I want to begin with some real basic thoughts. I will be covering some major issues as:

Support

Energy Levels and Work Attitudes that will change.

- Professional Approach
- Ethics
- Office Facility

Professional Appearance

- Office Appearance
- Business Appearance
- Personal Appearance
- Advertising – Public Relations
- Equipment

Business Decisions:

- Incorporating
- Sole Proprietorship
- Limited Partnership
- Limited Liability Company
- Professional Corporations: an S and C Corporation
- Competition

SUPPORT:

I am of the belief that support is a critical consideration. Does your family support your decision to work for yourself? As a new business owner, it is important to realize that your life is going to change in a number of ways, not all of which are always positive. It’s best if everyone involved has a realistic expectation of the time and money that will be required. Also, realize that it takes a little time to grow a new business. Nobody is going to be knocking your door down to come in just because you hung up a sign outside or have a great looking professional business card. However, a great website can be a real positive asset. (We will touch on this later.)

The point is this really amounts to a family decision with full disclosure about the positive and the not so positive aspects. Now having said all this that might sound like a negative venture,
realize that you have special skills that are unique in the world. Continuing to use your skills to benefit society is commendable. Also, your background, former law enforcement examiner, former FBI, CIA, US Government examiner also carries some obvious distinction.

Now experience of course is vital but at the same time, there has to be some understanding that the field in which you have been performing your examinations over a period of years, most likely will be a completely different market from your previous testing experience. For example, if you ran tests predominantly for espionage or sabotage concerns on maybe even a weekly basis, the market for that skill is not very significant in the private sector. Not too many spies or saboteurs typically show up at your office. My advice is to access and investigate the real market for your skills that you can supply. This could mean obtaining additional training. For example, throughout the country there are many areas in desperate need for sex offender PCSOT examiners in state as well as government probation jurisdictions. There are thousands of registered sex offenders ordered to undergo Post Conviction Sex Offender Testing (PCSOT). The word around the country is that there are not enough Certified PCSOT examiners to handle this volume, particularly in California. To become PCSOT Certified requires an additional 40 hours of training. In addition to this training, a revamping of your attitude toward this kind of an offender and this kind of work may be necessary. By the way, from my own previous experience, people say we were pioneers in this concept almost 20 years ago, and today, testing sex offenders on probation makes up easily 70% of our testing.

Another source of private polygraph testing requests come from sources you may have never thought about - conducting a test at the request of a defense attorney on a client he is representing. This is where your value as an unbiased polygraph examiner is welcomed. The key word here is “unbiased” and this will be discussed a little later. Another value of this concept is the enhancement of your professionalism, that you can deliver an impartial scientifically obtained decision, whether this is for the prosecution or the defense. Personally, our business has Federal Contracts. One is for Federal Probation and the other is for Federal Public Defenders. The point is this obviously helps present an unprejudiced reputation.
Here is also an obvious and important point, and that is continuing membership in the American Polygraph Association. I am aware that some agencies and departments have paid for APA membership fees for their examiners, now it is up to you. In any case, in talking about support, there are so many avenues of assistance provided by the APA to its members and particularly private examiners that need to be mentioned. Private polygraph examiners have constantly talked about the importance of continuing membership with the APA to keep up with and enhance their training by attending conferences. Particularly they have stated that they see the significance, to their now private practice, of the advice provided in APA journals and documents. Private examiners are aware that such support and information is extremely valuable because let us face it, as we have said before, you are now alone. It is you and your trade, and in a sense, the APA is your strongest partner.

ENERGY LEVEL AND WORK ATTITUDE:

To begin with, starting and running a business can be exciting, but it may require energy levels that address long, inconvenient work hours. The hours you work will be those necessary to meet the demands of your business. There is nobody around anymore to turn in an overtime slip to. Be prepared to make the physical and mental commitment.

Another issue is a look at a change in attitude toward perhaps a new work ethic concept. It is common in law enforcement or government employment to complain and often even “gripe” about “The work, the job, the pay, the boss, your supervisor, your outdated equipment, the boss, (yeah I said it twice), special treatment that some examiners get, and the hours.” This entire attitude might even be considered an occupational requirement. When you work for somebody else, you are almost expected to complain, (You know I’m right about this). However, guess what, in private practice, YOU HAVE BECOME THE BOSS. It is your equipment, it is your work, your hours, and the only one you have to gripe about is yourself. We are talking about a completely different mindset.

SELF-CONFIDENCE:

When we talk about self-confidence, we logically think that this would not seem to be a problem for many examiners in a law enforcement, investigation or agent atmosphere, where egos and confidence levels are often out of this world. However, self-confidence is critical for someone now who must face the risks involved in
starting a business, and particularly when faced with brand new challenges. As simple as making it through business dry spells (no clients coming through the door, which translates, to no money coming in to pay the bills.) The confidence to make decisions independently and sometimes under pressure is essential.

Let me walk you through another issue. When working for an agency, a department etc., an error, may be just that, an error. Everyone makes errors and assuredly, the examiner who made the error will still get a paycheck at the end of the week just the same. Most likely, they will stay right on the job (That is unless it is one of those major errors, and that is another story.) In addition, that examiner will wait for his or her next assignment. Your paycheck is not tied to how many people came through your door that week to be tested. Of course, nobody can continually make errors and stay bullet proof, but errors in your private practice can be fatal to the survival of your business reputation as well as your income. Remember, you are the sole income and you are the one that pays the bills to keep the doors open.

An important attitude that really rests in what we might call this new atmosphere of testing, is the basic question of what exactly is the objective of our work, the examinations that we conduct?

I agree that this may sound rudimentary; however, this is one of those times in life when it is good to undergo a reality check, and take a good look at your objectives. To give you an example, I sat in on a presentation at an APA conference years ago, and the speaker talked about inquiries he had made to a broad cross-section of law enforcement and agency examiners he met at various conferences. He said he was a little surprised at the pattern of answers he received when he asked them what exactly the objective of a polygraph examination is. He said these answers obviously came from the atmosphere of their work. He said many answered, “To get a confession” about a crime under investigation. Others said it was to “Get the truth” out of this person who was lying to them. Still others said the objective was “The focus of the investigation.” The speaker said that of the twenty plus people he talked with, nobody ever mentioned the goal was to render an “Unbiased Opinion.” He added that he felt it was amazing that most of the responses inferred that they conduct tests to confirm their prediction “Of the guilt of the subject.”

I have to tell you I tried this also on my own with a few examiner friends, not as many as noted above, but I received the same replies. The point this speaker made was that some examiners, innocently,
have a distorted perception as to the basic objective of polygraph examinations and undoubtedly it’s caused by the testing and case atmosphere they are exposed to in law enforcement and agency case complexities. I am not condescending of law enforcement or agency operations, but rather I am citing a reality. It not easy to sever the umbilical cord that nurtured and developed you into the proficient examiner that you are. The emphasis here is to remain objective about the information we get prior to the examination and unbiased even in our pretest interview.

ETHICS:

This topic is really an extension of what was just talked about. Ethics is sometimes hard to define. For some people, “What is ethical is the same as what is legal.” If what I do is not in violation of the law, then it is ethical. However, a good many things are legal but are still not good business. The maligning of another’s character by suggestion or innuendo may all be legal but certainly a challenge to call it ethical. I do not believe that simply considering ethics and legality to be identical with each other as giving the new private examiner much guidance in ethical behavior. As we all know, there are some in our profession, or somehow connected to our profession who seem to thrive on privately and publicly bashing other examiners at every opportunity. To be ethical is to be honest and fair.

OFFICE FACILITY:

Here is another very important, but frequently overlooked issue. I am not sure where I read this but the source stated one of the two most common reasons businesses fail is that the owner underestimates how much money it will take to get the business off the ground. I am sure that every examiner that went into private practice (Paula and I included) will tell you that they continually discovered something else that they needed to buy or to pay for that they never considered previously. Equipment needs never seems to end, and I am saying this from experience. We’re talking about “Office supplies, computers, printers, printer ink, paper, pens, pencils, sufficient space for storage, desks, chairs, file cabinets (Ones that lock), waste baskets (yeah waste baskets), trash cans, light bulbs, tissues, cleaning supplies, and probably a gang of stuff I haven’t remembered just now. Then let us look at the actual professional appearing office facility itself. First impressions are important. If you do not regard it as a professional business office, how do you expect anyone else to? This facility might need painting (our office did). It may
need decorating, maybe new carpeting (as our office did). A good business location can be critical, there’s a need for a professional looking waiting room, complete with “Chairs, perhaps a desk or two, tables, lamps, wall decorations, restroom facilities and related items such as toilet tissue, hand soap, paper towels, toilet bowl cleaning supplies, etc.,”

In addition, you know what; we have not even started talking about the polygraph equipment necessary to conduct a good test. One primary and obvious note is the reality that this is your own personal equipment, not the department’s, not the agency’s. Many examiners have never worried about polygraph equipment because as a department or agency examiner we used the departments or the agencies equipment. My advice is to start paying attention to those booths at annual conferences, get hip to the latest concepts and information available.

Now I considered giving a quick commercial like statement for my friends at the Lafayette Instrument Company, located in Lafayette, Indiana, at www.lafayettepolygraph.com, phone 765-423-1505, but then I thought I’m probably not allowed to do that, so I’m not going to do that.

However, seriously, you have to have testing equipment you can trust and rely upon. In addition to the computer, you also need to consider obtaining an “Examination chair and movement sensors, printer, video cameras.” There maybe also some “luxury items” that you find out that you can’t live without in your polygraph suite, such as “A nice comfortable chair for you, the floor pad for your chair, and maybe something like a small fan for ventilation during those lazy crazy days of summer.”

Something that goes hand and hand with this concept of professional appearance also applies to the product you produce, your polygraph examination report. Clients may judge you, maybe forever by that report they see. Your professionalism shouts out in the work you produce, and just not your test determination. My advice is, to say good-by to the one page and the two page reports, if it has been your practice. Think in terms of Content, Design, Construction, and above all, Information. Again, first impressions are important. If you don’t regard your office as a professional business and your work product as professional, how do you expect anyone else to?

PROFESSIONAL APPEARANCE:

This brings me to the topic of personal appearance. My point is that if you want to
present yourself as a professional you need to look like a professional. It is like saying you have to walk the walk. During the 12 years I worked as the Chief Investigator for the prosecuting Attorney’s office, which seems like a lifetime ago, I had the fortune to be sent to classes and seminars about reading people from such things as body language, speech and dress. As a result, I gave some classes on these topics at the law Schools of Notre Dame and Valparaiso University, giving assistance to law students regarding such things as jury selection using such concepts. What I took from these courses influenced me in many ways; take for instance how certain clothing can be influencing. Unlike the contents of your wallet, clothing is highly visible and gives off indications (true or false) of the wearer’s background. Books and topics such as “Dress for success” works. I remember an experiment I want to share that demonstrated the link between clothes and status. The issue investigated the willingness of pedestrians to copy a jaywalker breaking the law by crossing the street against the red light. When the offender was dressed in a suit, many almost everyone followed his lead and crossed against the light. However, when the same man was poorly or casually dressed, nobody was tempted to do the same. The bottom line that I learned was that the thing that matters is dressing in a way that matches the impression you wish to convey.

When individuals want you to believe them and to have confidence in them, how do they dress? How do lawyers dress for court, how do defense attorneys dress their clients they are defending when appearing in court in front of the jury? How does every TV newscaster dress? Even the person doing the weather. Experiments have shown that newscasters in what might be called “casual office dress” were not taken seriously. In summary, dressing the part means. 1. Wearing clothes that create the impression you want to make. 2. Avoid anything that might contradict that impression. 3. Consider every aspect of your appearance from your hair length for males to the amount of makeup for women. I think I have talked enough about this but the message is that clothing has the power to influence not only how others perceive you but also the way you regard yourself.

I want to leave this topic of appearance with a true personal story from my time when I was with the Prosecuting Attorney’s office. I have told this story a number of times because it is a favorite. One of my assignments was to assist in jury selections and another assignment was to interview jurors after a trial to gather information that could assist prosecutors in future trials. For example,
what approach made by the prosecutor during the trial helped them make their decision? What was helpful, and what was not. One juror I interviewed was dressed in a polo shirt and slacks throughout the trial; he told me “The Defense Attorney was more professional than the Prosecutor.” This surprised and confused me. In asking him what he meant by this, he said, “The Defense Attorney was more professional because he wore a long sleeve dress shirt under his suit, and the Prosecuting Attorney was wearing a short sleeved dress shirt.” Now since neither lawyer ever removed their coats at any time during the trial, I asked him how he knew this. He said, “Well when the Defense Attorney pointed, you could see his sleeve, but when the Prosecuting Attorney pointed… no sleeve.” When I got home, I threw away all my short-sleeved dress shirts and never worn one again.

ADVERTISING:

People obviously have to be told who you are, what you do and where you are located. I can only speak on this from my own experience that I have been doing for 25 years. We have experimented with a good amount of avenues, some were productive, but some turned out to be bombs and a waste of money. It is my position that “A good professional website is an absolute must.” Everyone is on the web these days. This advice is followed by listing in all the phone books in your area. We tried rather expensive ads in various directories with no success. In addition, a professional looking business card is also a “must”. The key word here is “Professional Looking, Expert in your field Looking” business card. Unless you are selling real estate or insurance plans, do not put your picture on the business card. If you want a model, look at what attorney’s business cards look like, or what corporate or company executive cards look like. Let me add however, the most effective advertising comes from “Word of mouth.”

I also strongly think that Public Relations goes hand and hand in this topic. This includes belonging to area organizations and even better, being a guest speaker at meetings of your area’s Fraternal Organizations such as, Elk’s Club, Lion’s Club and Exchange Club, etc.

BUSINESS DECISIONS

About the business, to begin with, we are all aware that there are many decisions to make and few sources of “helpful” information normally available. For example, is it best to run your business as a Sole Proprietorship? Maybe it would be better as a Limited Partnership or a
Limited Liability Company. Alternatively, is the best solution to Incorporate, as an S or C Corporation? There are upsides and downsides to all these directions. One quick opening point of advice would be to know what licenses or permits you might need in the location you are planning to live.

So let us start with talking about a basic practice. I would say, first, find yourself an attorney. Let me say that again because it’s important. Find yourself an attorney, and then find an accountant. Your experience in the field will certainly help you pick an attorney you can trust. Much of what I am going to share today had come from his information, and what I researched while I was with the Prosecuting Attorney’s office. The same goes with your selection of an accountant, pick one with a sound reputation and one that likes you. I am noting this point as high on the list because it took me years to find the benefit of these experts and they would have been extremely helpful in my early years as a private examiner. You need these experts. As I mentioned before there are three different directions that you can choose to start.

SOLE PROPRIETORSHIP:

This is considered the most common and simplest form of business. Most of the small businesses operating in the United States are sole proprietorships. Some believe it is the cheapest way to go. You must get a name for your business, get a business license where you are going to peddle your trade, come up with and file a business name and put out some kind of advertising, maybe even a local newspaper story and open your door to business. The startup cost should be minimal.

That is the upside. The downside is something to really consider. You and your business are legally equal in this position. If something goes down the wrong way, not only is your business civilly liable, but also so are you and your personal assets. That means your home, car, bank accounts, dog, cat, pony are all at risk. A sole proprietorship also means that you are alone. No partners, no agency, no department are there to share or help you out. That also means that if you are sued, you do not have anyone else to help pay towards the suit should you lose in court. As a Sole Proprietor, you will pay the employer as well as the employee tax burden.

Sharing and operating your business with a partner is something to consider. A general partnership means that you
and your partner share everything. The profits and the expenses. The downside is that your partner may do something dumb and you share in his/her mistakes. We all have had a variety of experiences in our former occupations as either an officer or an agent. We can think of the good ones but also there were others on the other end of the spectrum, ones that took poor chances, the ones who were investigated by internal affairs, etc.

If you are going to go into partnership with someone, you might want to consider some trial test period. Pick out a couple of projects together. See if it works. Ask yourself, is that partner going to work out or get me sued by doing something stupid.

LIMITED PARTNERSHIP:

Two types of partnerships, General and Limited partnerships. As I stated previously, general partnerships are equal, have equal power, obligations and unlimited liability for debts, etc.

Not all partnerships have equal power. Therefore, a limited partnership may be considered. A limited partnership may have one general partner. The other partners are called “limited partners.” In this type of set up, the general partner has full management responsibilities and control on the partnership business on a day-to-day basis. The general partner runs the business and makes the decisions. A limited partner cannot incur obligations on behalf of the partnership and does not participate in the daily operations and management of the partnership. Basically, the limited partner in a limited partnership initially contributes capital and later receives a proportionate share of the profits. We are talking about a passive investor.

A limited partner is capped at the amount of their financial contribution to the partnership. Should something happen, where the business is sued, the damaged party could go after the general partner’s personal assets, but would be limited to the limited partner’s capital contribution.

INCORPORATING:

The upside of forming your business as a corporation is that it limits your personal liability, which is not true for partnerships and sole proprietorships. This is where are company “MS Arts, Inc.” sits, doing business as “Mindsight Consultants.” If something occurred where your business did something (unexpectedly) stupid, and the damaged party sued your corporation, the damaged party could only go after the assets of the corporation and not your personal assets.
Your home, bank account, private cars, your bird feeder, etc., cannot be touched if you followed the directions of your accountant and your attorney.

Some additional benefits of incorporating:

• The corporation limits one’s personal liability.
• The corporation is a separate legal entity. It has its own tax identification
• number apart from the owners.
• An important corporate characteristic is the ability to consolidate, merge
• or buy other corporations.
• A corporation can buy and sell property in the corporate name.
• Better tax advantages.

Some downsides of a corporation:

• It is expensive to create and maintain the incorporating status depending
• on the type and complexity of the corporation.
• Majority shareholders can overpower minority shareholders.
• A corporation is subject to greater governmental regulations and control
than other types of businesses.
This is why I made an early point about the importance of finding a good attorney. You need this legal advice.

There are several types of corporations including, limited liability companies, closely held corporations, professional corporations, and “S” and “C” corporations. I won’t get into all of this varieties because I feel it is beyond where we as a private practice polygraph examiner business would like to be.

COMPETITION:

In a private practice your competition is usually from two sources, depending on your location, population and issues. One, unbelievably, will be other private examiners in your area. It is an unfortunate part of life. This is not as much a concern in some parts of the country as others because there is usually enough testing business to go around. However, that is not the case in other communities where examiners have been known to fight for clients, and at almost any cost. There have been issues with questionable examiners who have been known to engage in acts that have included fee-cutting to character assassinations. APA members are bound by ethics policies and procedures that are found in our Anti-Trust Statement, which is also in compliance with all Federal and State anti-trust rules. In summary, “The APA shall not, nor shall any of its Officers or Members, in any fashion whatsoever attempt to lessen competition or fix prices arbitrarily or to create a combination or
pool in violation of the laws of any state.”

To survive, a competitive spirit is necessary, but the secret is to be professionally competitive while at the same time being nonaggressive or unprofessional. Above all, maintain the highest degree of ethical practice possible. The best advice that has worked for me is to exhibit your professionalism for everyone to see in the polygraph report that you generate. Do the hawking and the marketing of your competence and your proficiency. Forget those two page reports that might have been acceptable in the past and start thinking like a professional examiner and not just a technician.

That is one source of the competition, the other comes from various apparatuses that scientific testing reports have named them credibility challenged, such as voice stress or something similar that might come on the horizon. There is certainly enough information written in APA studies and journals that easily furnishes all of us with necessary information to address this.

In closing, let me say for the right person, starting, running and keeping a private polygraph business can be a rewarding experience with endless challenges and opportunities. Also, as I said earlier, seek advice and services of a good attorney. Next, seek advice and services from sources such as a CPA. This is desirable for so many reasons. (Oh and by the way, you might take note how they are dressed).

Steven Duncan
Director

Fellow APA Members, I hope this Report finds everyone safe and healthy for the Holidays to come.

As promised in my last Report, we have the Ethics and Grievance Committee set up and operational. I am serving you as General Chair with Bill Gillespie functioning as Chairperson. The Cases we have received are being evaluated with the ones reaching the threshold for further scrutiny to be assigned for investigation.

As a Committee we are also preparing to continue work on completing the Ethics and Grievance Policy which was already in progress. We are also taking steps to standardize the entire process for addressing complaints, notification of affected Members and investigation. The Board is continuing to work on projects for the good of the order with two teleconferences behind us and the mid-year Board Meeting scheduled for March, 2016.

If I can assist any Member, feel free to call or email me.
Greetings fellow professional seekers of truth. I will keep my report to you short and try to summarize what my committee and I have been, and will be working on in the future. I am once again chairing the Education Accreditation Committee. This year, Vice President Law Enforcement Dan Violette is vice-chairman of the committee with me. This committee has many of responsibilities so it is helpful to have another chair to learn the intricate details of the processes involved and to help with carrying out the committee’s mission.

2015 has been a busy year on the inspection side of the committee. 14 education and training programs have been inspected or in the inspection process for accreditation. The number of accredited programs grows every year, with the bulk of new programs established outside the continental United States of America. With over 30 accredited programs, this keeps the committee constantly occupied reviewing paperwork and ensuring inspections are conducted.

The non-inspection side of the committee, at the request of the directors of currently accredited programs, will begin to look into the feasibility of allowing students who attending an APA accredited program to attain college credit for their basic polygraph education and training. At this point, this idea is still nascent. Throughout the year, the committee members will look at different options and their cost estimates. The goal is to further education opportunities for prospective polygraph professionals.

As always, may those fighting for our freedom against threats, both foreign and domestic, be safe, and have Godspeed in their return to friends and loved ones.
On 9/1/2015, the membership of the American Polygraph Association voted to adopt a revised By Laws at the Chicago meeting. This adoption effectively eliminated “Divisional Membership” and added a category of membership for “Divisional Affiliate”. Existing Divisional Members did not automatically transfer over to a Divisional Affiliates. All polygraph associations that meet the approved criteria and want to seek Divisional Affiliate Membership are urged to contact the APA National Office in order to initiate the processing of an application.

3.7 Divisional Affiliate

3.7.a Divisional Affiliates are only those not for profit polygraph professional membership organizations or associations who desire a professional relationship with the APA and whose members agree to abide by the APA Code of Ethics and the APA Standards of Practice. No individual may claim APA membership as a result of being a member of a Divisional Affiliate. An applicant for Divisional Affiliate shall:

3.7.a.i Deliver a copy of its then current bylaws (or the equivalent thereto) to the APA and, if granted membership by the APA, immediately provide the APA with subsequent revised versions of such bylaws; and
3.7.a.ii Be granted Divisional Affiliate status upon at least a two-thirds (2/3) vote of the Board of Directors at which a quorum is present.

3.7.b Divisional Affiliates shall:

3.7.b.i Be autonomous in all matters, but must be in compliance with the APA Code of Ethics and the APA Standards of Practice;
3.7.b.ii Maintain financial accounts and records separate and apart from the APA;
3.7.b.iii Not bind the APA to any financial commitment or responsibility; and
3.7.b.iv Have their Divisional Affiliate status revoked upon a two-thirds (2/3) vote of the Board of Directors at which a quorum is present if such member:

3.7.b.v.A Fails to subscribe to or enforce upon its members the APA Code of Ethics and APA Standards of Practice; or
3.7.b.v.B Fails to hold a meeting of its membership within a twelve (12) month period.
WISHING YOU

a happy

HOLIDAY

season

AND

A HAPPY NEW YEAR
One of the foremost obstacles of any freshly graduated professional is the transition phase in where the theoretical studies are transformed into practical implementation. At this point the beginner professional may be hesitant, uncertain and afraid of making mistakes, especially in those professions in were mistakes are critical. One of the most effective resolutions to this situation is the internship, in where the beginner’s performance is monitored and coached by an experienced professional. The word internship is relatively modern (since the 1904 ) the concept, that was once called apprenticeships, is an ancient method of training in most professions. Recognizing the importance of internship in some profession (such as: medicine, law, etc.) made it a prerequisite before final recognition and acceptance. The intern’s instructor guides him or her and by doing so that profession cultivates its next generation. In return the intern receives a safety net while taking their first professional steps. While the APA does not mandate an internship period it requires from its membership applicants to complete 200 tests, which serves in a way as a type of an internship period. Interesting, and perhaps unfortunately, it does not require that those tests should be performed under the supervision of an experienced examiner. Yet, APA school accreditation requires the students to conduct 3 field like mock crime tests that should be monitored by an instructor.

Internship period is an effective and necessary period of transition from theory to practice, but professional improvement should not stop there. Examiners should...
constantly seek to expand their knowledge (through reading and participation in seminars) and perfect their skills through quality assurance and quality control programs to which unfortunately most of private sector examiners are not exposed. No doubt the most effective internship and further professional education can be achieved by the guidance of an experienced examiner. For the benefit of those examiners who have no access to such, I suggest a self-monitoring quality control aid, to those eager to improve and better their performance. In sports or sales performance and achievements can be clearly defined and tagged by numbers which in return motivate the individual to perform better and better. Currently examiner lack a measuring tool which would enable them to measure and manage their performance. Professionals, especially beginners, must get feedback of their performance; otherwise they will repeat their mistaken practice into a faulty habit with the potentially adverse consequences resulting.

Although the term self-monitoring sounds like an oxymoron due to the fact that self-deceit is so common, my experience as an instructor of interview, interrogation and polygraph taught me otherwise. One of the most effective monitoring aids is the CCTV that allows analyzing the interviewer / interrogator / examiner performance. A common phenomenon that I witness while reviewing taped sessions is that the interviewers / interrogators / examiners are THE MOST critical when reviewing their own performance. SMaRT which stand for Self-Monitoring and Reviewing Table was developed in order to examine the extent of correlation between the examiner practical performance and the required theoretical protocol acquired at training. Consistent self-monitoring of own performance along with recording it into a table, assist examiners to measure and manage their performance in order to improve. The benefits of using SMaRT are:

- By repeatedly performing SMaRT, the items within it are internalized and branded into the examiner memory and turn into a good practice checklist.
- SMaRT scoring indicates the correlation between the examiner training and practice or in other words how well are they related to each other.
- SMaRT enables the examiner to spot her/his weaknesses and hopefully improve.
- SMaRT's Performance Tracking Table – PTT, visually displays the examiner’s weak spots along with the progress made from evaluation to evaluation.
- The PTT figures are valuable motivational to constant improvement of the results.

Although SMaRT was developed for individuals it can also be used by instructors or by quality control examiners.

SMaRT is a simple tool and it takes just a few minutes to complete which makes it cost beneficial to employ. Just do it!
# SMaRT - Self-Monitoring and Review Table

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<tbody>
<tr>
<td><strong>A Pre Test</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1 Had all case data prior to the test</td>
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<tr>
<td><strong>B Pretest Interview</strong></td>
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<tr>
<td>BA Initial</td>
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<tr>
<td>2 Introduced myself</td>
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<tr>
<td>3 Verified examinee ID</td>
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<tr>
<td>4 Tell examinee to turn off phone, etc</td>
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<tr>
<td>5 Acknowledge nervousness</td>
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<tr>
<td>6 Inform of A/V being recorded</td>
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<tr>
<td>7 Test length</td>
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</tr>
<tr>
<td><strong>BB About Polygraph</strong></td>
<td></td>
<td></td>
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<tr>
<td>8 Explain physiology related to lying</td>
<td></td>
<td></td>
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<tr>
<td>9 Voluntary/Involuntary systems</td>
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<tr>
<td>10 Involuntary physiological changes</td>
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<tr>
<td><strong>BC Collect biographical data</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11 Education</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>12 Suitability questions</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>13 Current medical treatment</td>
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<td></td>
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<tr>
<td>14 Consume of medication</td>
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<tr>
<td>15 Chronically Disease</td>
<td></td>
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<tr>
<td>16 Pain</td>
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<tr>
<td>17 Mental Health Treatment</td>
<td></td>
<td></td>
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<tr>
<td>18 Alcohol last 24 hours</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19 Illegal drugs last 24 hours</td>
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<tr>
<td><strong>BD Consent to take the test</strong></td>
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<tr>
<td>20 Aware of legal right to refuse</td>
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<tr>
<td>21 Aware of test consequences</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>22 Execution of consent/rights form</td>
<td></td>
<td></td>
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<tr>
<td><strong>BE Discussion of case data</strong></td>
<td></td>
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</tbody>
</table>

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| 23 | Why are you here today                                   |
| 24 | Walk thru that day                                      |
| 25 | Walk thru crime (& scene)                               |
| 26 | Establish relationship to scene                         |
| 27 | Behavior provoking questions                            |
| 28 | Directly ask relevant questions                         |
| 29 | Why wouldn’t you do this?                               |

**BF**  Discussion on past and personality (CQ)

| 30 | Done such things in the past                           |
| 31 | Can you do it                                          |
| 32 | Develop theme                                          |

**BG**  Question phrasing

| 33 | Cover the issue                                       |
| 34 | Right on target                                        |
| 35 | No double meaning questions                            |

**BGA**  RQ

| 36 | Corresponding relevant                                |
| 37 | Right on target                                        |
| 38 | Proper sequence review                                 |
| 39 | Appropriate test questions format                      |
| 40 | Reviewed all test questions                            |
| 41 | Validated test format                                  |

**BGB**  CQ

| 42 | Upper body tubes                                       |
| 43 | EDA                                                     |
| 44 | Cardio Cuff                                            |
| 45 | Motion detector                                         |
| 46 | Gave proper test instructions                          |

**BH**  Explain instrument & test behavior

| 47 | Directions for ACQT                                   |
| 48 | Explanation of ACQT                                   |
| 49 | Placement of sensors                                   |
| 50 | Test instructions                                      |
| 51 | Ease into operation                                   |
| 52 | Feedback on ACQT                                      |

**C**  Test

| 47 | Directions for ACQT                                   |
| 48 | Explanation of ACQT                                   |
| 49 | Placement of sensors                                   |
| 50 | Test instructions                                      |
| 51 | Ease into operation                                   |
| 52 | Feedback on ACQT                                      |

**CB**  Data Collection

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53 Watch examinee
54 Read questions loud and clear
55 Read all question in proper sequence
56 Waveform proper size
57 Proper spacing between questions
58 Chart marking (annotations, artifacts)
59 Questions asked when gained homeostatic
60 Proper number of charts

CC Between Charts
61 Adjust sensors if needed
62 Discuss questions
63 Change RQ/CQ if needed
64 Break between charts
65 Enforce physical responses

CD Data Analysis
66 General review
67 Numerical scoring
68 Consider anomalies

D Post Test
69 Ask for explanations (if DI)
70 Retest (if got explanations)
71 Post test interrogation (if ID)

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Positive</th>
<th># Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>64</td>
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<td>High</td>
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<tr>
<td>Moderate</td>
<td>3</td>
<td>35</td>
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<tr>
<td>Low</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Very Low</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Correlation Table

A. Pre Test
B. Pretest Interview
   BA. Initial
   BB. About Polygraph
   BC. Collect biographical data
   BD. Consent to take the test
   BE. Discussion of case data
   BF. Discussion on past and personality (CQ)
   BG. Question phrasing
### Performance Tracking Table - PTT

<table>
<thead>
<tr>
<th>Task</th>
<th>Date</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>A. Pre Test</td>
<td></td>
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<tr>
<td>B. Pretest Interview</td>
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<tr>
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<tr>
<td>BF. Discussion on past and personality (CQ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BG. Question phrasing</td>
<td></td>
<td></td>
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<tr>
<td>RQ</td>
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<td></td>
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<tr>
<td>CQ</td>
<td></td>
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<tr>
<td>BH. Explain instrument &amp; test behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Test</td>
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<tr>
<td>CA. ACQT</td>
<td></td>
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<tr>
<td>CB. Data Collection</td>
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<tr>
<td>CC. Between Charts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD. Data Analysis</td>
<td></td>
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<tr>
<td>D. Post Test</td>
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</tbody>
</table>

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Recently a non-polygraph examiner wrote the APA National Office and asked a number of questions. Our Chairman Ray Nelson was kind enough to take on these questions and provide some thoughtful answers. After reading them I realized these type of questions are not rare and felt the association could benefit from reading the questions and Raymond’s answers.

Dear Sir/Madam:

I am doing my own independent research on polygraphs and want to learn more on the facts concerning them. Have several questions:

(1) If an individual fails one in a criminal investigation does that mean they are guilty?

(2) If an individual has an inconclusive result in a criminal investigation does that mean they are guilty also?

(3) If an individual has anxiety attacks in the middle of a test does that make the test invalid or are these things taken into consideration?
If an individual is on medication and does not take it and fails does that indicate deception? Or, is that also taken into consideration beforehand?

If you can answer these question, I would appreciate it.

We always like research questions. Here is my attempt at some answers.

1) All form of scientific testing (which is all testing because unscientific tests are not tests) are a two-fold process of inference and classification. Inference is a process of making structured and replicable probability estimates about something for which there is no simple and perfect deterministic observation and also not direct physical/linear measurement (e.g., personality, intelligence, etc.), but can also be used when the cost or risk associated with direct physical measurement is high (example: pregnancy tests, for which we use a hormone as a proxy instead of something more invasive).

From a research (scientific) perspective any we are concerned mainly with whether there is replicable empirical evidence to support the notion that a particular procedure will be successful most of the time for most people. This is keeping in mind that scientific tests are not expected to be perfect - they are expected to quantify the margin of uncertainty surrounding a conclusion (again, when simple and perfect deterministic observation nor direct physical/linear measurement are impossible or impractical).

Classification refers to the process of attempting to reach a conclusion that an individual case comes from one of the criterion states pertaining to the test. These criterion states can be described contextually (e.g., pregnant or not pregnant), but scientists generally prefer to use the abstracted terms "positive" and "negative" which mean simply that the probabilistic test result is of sufficient strength to classify the result into a test outcome category according to an objective decision boundary that is established prior to testing.

Scientists and people who use scientific tests usually do not use the terms "fail" or "pass" but these terms are commonly used in school settings where testing is used to evaluate academic progress or achievement. There are a number of contexts in which these terms are not useful and exceedingly judgmental. For example, when testing for academic ability it is not reasonable to refer to test results in this way.

Categorical results in the polygraph context involve the concepts of decep-
tion and truth telling. The polygraph test has been described simplistically as a “lie detector” though this term is incorrect and there is a wealth of scientific publication that explains why and will also provide a lot of information about the physiological, psychological and probabilistic foundations of the modern polygraph.

It is important to remember that ALL test results are fundamentally probability statements.

“Guilt” and “Guilty” are legal terms that represent legal judgement. Legal judgement is the role of judges and juries. Neither the polygraph nor any test is intended to replace the authority of the court as the finder of fact.

2) “Inconclusive” is a term that is sometimes used describe a test result for which the strength of the test data and probabilistic evidence is insufficient to support a categorical conclusion. That is all (though people can be creative in the different ways they attempt to explain or understand why any imperfect scientific (probabilistic) test cannot always give a result every time. Remember there is no such thing as a perfect test of any kind. A more abstracted term that is preferred by some scientists, researchers, statisticians, and data analysts would be “not statistically significant.”

3) Anxiety is a potentially serious psychiatric disorder that can sometimes be difficult to diagnose. In particular, mental health practitioners will need to work with medical professionals to rule out the well-known potential that the experience of psychiatric anxiety is not the result of a medical cause. Anxiety disorders with medical causes will require medical treatment to remediate. Properly diagnosed psychiatric anxiety disorders can be treated via psychotropic medications or psychotherapy or both. Many persons with psychiatric anxiety disorders function more or less completely normally (in terms of most lifestyle activities) though it is important to always honor the fact that a person has been diagnosed with a psychiatric disorder and that normal day-to-day functioning will most likely depend on continued management of the psychiatric problem.

Polygraph testing is not a known cause of psychiatric anxiety problems, and there is no plausible rationale or explanation why it would be.

Aside from the potential seriousness of an untreated psychiatric anxiety disorder, many people live normal lives with mild or moderate levels of anxiety. Quite obviously, any person who is experiencing a psychiatric anxiety disorder with severe symptoms
(severity specifier) consult a psychiatrist or competent mental health professional for help, or should present themselves to the local emergency room for immediate treatment if necessary.

There is also the tendency for people to misunderstand the psychiatric meaning of the word “anxiety” and to misuse this word when describing psychiatrically normal experiences of frustration, stress or inconvenience.

4) Polygraph testing is not a test of medications. There is no clear rationale why the polygraph would be sensitive to medication compliance, nor any rationale that non-compliance with medications would consistently adversely affect the polygraph result in such we could reliably expect or predict that non-compliance would cause the probabilistic test result to support a positive conclusion.

Medication use in the U.S. and many the countries has become rather common. Medications today are quite effective and generally have only mild and tolerable side effects. Today’s medications are so effective and so well tolerated that it is actually very difficult for pharmaceutical companies to get approval for new medications that have uncomfortable side effects or that do not work as well or better than our existing available medications.

Most people taking prescription medications for physical or mental health problems will want to cooperate and comply with the medications as prescribed by the medical or mental health care provider. People who function optimally while taking medications will sometimes be unsure whether the medications are working, though they will report fewer medical or psychiatric symptoms - and sometimes others will observe the improvement.

Non-compliance with medications should be discussed with the medical or mental health care practitioner. Non-compliance could be an indication of a number of different possible problems that are too varied and numerous to enumerate in this short email.

Hope this helps.

rn
Remembering the Pioneers

**Leonarde Keeler** (1903-1949), named after Leonardo Da Vinci, preferred to be known as Nard. He was a Berkeley high school student and amateur magician when he became entranced by Larson’s machine. His patented “**Keeler Polygraph**” made him the personification of American lie detection.

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**John Larson** (1892-1965), the nation’s first cop with a Ph.D., assembled the first working “lie detector,” under the auspices of Chief August Vollmer of Berkeley, California. This photograph, dated April 24, 1921 shows Larson two days after his first case, the College Hall theft, transformed his life.

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August Vollmer (1876-1955), chief of the Berkeley Police Department from 1906 to 1932, was the celebrated father of American professional policing. Vollmer saw in Larson and Keeler’s lie detector a means to replace brutal “third degree” interrogations with more scientific and lawful techniques.
By Tuvya T. Amsel

Israel is a narrow and small country about the size of New Jersey with a population of 8,350,000 people (75% of them are Jews). Officially the “State of Israel”, it is situated at the southeastern shore of the Mediterranean Sea and the northern shore of the Gulf of Aqaba in the Red Sea. It shares land borders with Lebanon to the north, Syria in the northeast, Jordan on the east, the Palestinian territories on the west, Gaza Strip to the east and Egypt to the southwest.

Israel contains geographically diverse features within its relatively small area. Its financial center is Tel Aviv, while Jerusalem (which mentioned in the Bible 700 times) is its self-designated, capital. The notion of the "Land of Israel", ...
has been part of the Israelites history since the times of Abraham somewhere in the early 2nd millennium BCE and the first Kingdom of Israel was established around the 11th century BCE. Subsequent Israelite kingdoms and states ruled intermittently over the next four hundred years, until 586 BCE when King Nebuchadnezzar II of Babylon conquered Judah, destroyed Solomon's Temple and exiled the Jews to Babylon. Though Palestine was always occupied by Jews in 1882 a slow but steady stream of Jews immigrated to Palestine, then under Ottoman rule. The immigration was a reaction to the nonstop prosecution and pogroms inflicted upon the Jews in Eastern Europe. In WWI the British occupied Palestine and ruled there until 1948 when Israel declared its independence.

Today Israel is one of the fastest growing countries, a modern and technologically advanced society and the development center of leading technology giants such as Intel and alike. On your next trip when you navigate your way with the help of Google map keep in mind that you are using Waze navigating system a genuine Israeli company.

**History of Polygraph in Israel:** The polygraph was first introduced in 1957 when a Government’s investigator took the Reid school in Chicago. A year later another two government investigator took the Reid training in Chicago. One of the students Mr. Victor Cohen still remembers Mr. Reid’s advice: “… use your logic, don’t burn your hands”. In a few years the polygraph became
an important investigative aid and today it is used by Government, Law Enforcement and private examiners (about 150 of them), conducting thousands of specific and security tests every year. There are three APA accredited schools in Israel.

**Research:** The national Israeli Police Polygraph Laboratory led by Dr. Avital Ginton and its chief researcher, Professor Eitan Elaad, published numerous polygraph-related papers. Other famous local researchers from the Hebrew University in Jerusalem are: Drs. Kugelmass, Lieblich and Ben Shakhar. Prof. Elaad continues with polygraph research in Ariel University.

**Legal Status:** In 1970 the Israeli Supreme Court refused to accept polygraph results as admissible evidence. But after the 1982 Justice Department Inquire Committee into the issue, the Supreme Court decided in 1988 that polygraph results are admissible upon stipulation in civil cases and admissible in pretrial procedure in criminal court. Family Courts use the polygraph excessively in restraining order requests as well as the Rabbinical Court (the only authority that deals with marriage and divorce) that once went as far as ordering a party to take the test and considered the refusal as a sign of guilt.

**Local Association:** The Israeli Polygraph Examiner Association (IPEA) is an APA Divisional Member and has members from the government, law enforcement and private sectors. Its bylaws are similar to the APA bylaws. (For a review, see its regulations and ethics in English in www.polygraph.org.il/Regulation--Ethics.htm)
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SOUTH AFRICA: Ben Lombaard
E-Mail: ben@lietech.co.za

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History of p-values (what they are)

P-values, symbolized by p (in italics), have been part of statistical and scientific discussions ever since Pierre-Simon Laplace (one of the greatest scientists of all time, 1749-1827) computed the difference in the human sex ratio, showing a real but unexplained phenomenon in which there are more male than female births. Laplace was, in part, an astronomer who sought to explain the formation of the solar system with the widely accepted nebular hypothesis. Astronomers became interested in p-values and statistical distributions because they were engaged in the difficult problem of estimating the locations of objects in the universe, and found that observation error and measurement error were making precise estimations difficult. Ronald Fisher (1890-1962, one of the greatest statisticians of the 20th century) solidified the use of p-values in scientific discussions when he described their computation and use in his book Statistical Methods for
Research Workers (1925). Fisher also studied astronomy during his early years at Cambridge.

Because p-values can take any value from a distribution of possible values, and the values in the probability distribution have a known probability or frequency of occurrence. In practical terms this means that a p-value tells us the expected frequency or proportion of times we expect to see a particular result, and can also tell use the expected frequency or proportion of times we expect a result equal to or greater than the observed result if we repeat an experiment numerous times. P-values have become a central part of the scientific method. In formal terms the p-value is a statistic, which means that it is calculated from sampling data, not the population. Values that are calculated to describe the characteristics of population a population are called parameters.

According to Moore, D. S. (2007, The Basic Practice of Statistics) a p-value is the probability, computed assuming that the hypothesis is true, that the test statistic would take a value as extreme or more extreme than that actually observed. The smaller the p-value, the stronger the evidence against a hypothesis. Herein lies part of the confusion of p-values; in the tradition of hypothesis testing, experimental evidence regarding a hypothesis will most often describe the probability of the observed data under the null-hypothesis.

**Hypothesis testing (null-hypothesis significance testing)**

Understanding the practical meaning of a p-value require some understanding of the scientific method in which a scientist will suggest an idea in attempt to explain something about reality and the universe. A scientific experiment is designed to test the idea by evaluating possibility that the idea is incorrect. This is because all scientific conclusions are relative to some alternative. Formally, the idea is called a hypothesis, and the opposite of the idea or hypothesis (the anti-hypothesis), is called the null-hypothesis.

**What is a hypothesis (what is a null-hypothesis)?**

A hypothesis can be thought of a systematic explanation of reality and the universe, or some small part of it. Although it is intended to be a systematic explanation, a hypothesis is actually a question – a research question. A hypothesis or question cannot be accepted as an answer unless it supported by evidence. Because it is systematic, a hypothesis is expected to make sense both intuitively and also
in consideration of all available evidence.

If the hypothesis states that reality and the universe, or some small part of it, works in some particular systematic way, the null-hypothesis states essentially that the explanation or hypothesis makes no difference, that reality and the universe do not work in the expected systematic way, and that random chance or other unknown causes are likely to have caused the observed data. Another way of stating this is that a null-hypothesis is an explanation of reality and the universe for which the observed evidence could be observed regardless of the systematic hypothesis.

An easy way to understand this process is through the consideration of random chance as a possible explanation for the observed evidence. For example: how often or what proportion of times can we expect to observe something similar to the observed data if random chance were the only cause for the outcome and if we repeat an experiment numerous times? An experimenter will calculate that probability as a p-value. A p-value is therefore sometimes thought of as the proportion of times we expect to see the observed data under the null-hypothesis. An experimenter will reject the null-hypothesis when the p-value or probability of obtaining the observed data is sufficiently low, below an established threshold, if the data are the result random chance or unsystematic causes. When the null-hypothesis is rejected the data can be said to support the hypothesis.

What is a scientific theory?

When there is replicable evidence to support an idea the hypothesis can be accepted as a working theory. A theory is accepted only to the extent that there is no evidence with which is it inconsistent or cannot explain. A hypothesis is not accepted as a working theory without reasonable and realistic attempts to test it. When there is any unexplained phenomena, an experimenter will be obligated to search for a better hypothesis to explain the observed phenomena. A working theory is simply a working hypothesis that is supported by some evidence. All theories are subject to additional discussion, testing and scrutiny, and are subject to being replaced when they are incorrect or when a more parsimonious explanation can account for the same evidence.

What is a law of science?

An idea may be regarded as a law of science only when the evidence very powerful and new evidence is not ex-
pected to ever controvert the idea. Most ideas are in play only at the level of hypothesis and working theory, and these can be expected to be somewhat temporal because science is a process of continuous learning.

**P-values and a statistical measurement theory for the polygraph**

The statistical hypothesis or theory of the polygraph is simple: recordable differences occur in physiological activity in response to different types of test stimuli as a function of deception or truth-telling in response to the relevant target stimuli. The null hypothesis is that physiological responses are not systematically loaded and are simply due to random chance. This type of statistical hypothesis can be tested and evaluated using a p-value or other statistic. Data can be evaluated with consideration for a theoretical random distribution of test data and the null hypothesis could be rejected if the probability of obtaining the observed data is below an established threshold. This hypothesis has been investigated numerous times already, and the null hypothesis has already been rejected. When the observed data support a rejection of the null hypothesis, the evidence has been consistent enough that it can also be said to support the (alternative) statistical hypothesis as a working theory. Note that a statistical theory or hypothesis for the polygraph describes only the data and does not attempt to make attributions about the underlying cognitions or subjective emotions that are related to the observed physiological responses.

A polygraph test can be thought of as a generalization of the concept of hypothesis testing. The analytic hypothesis is that physiological reactions to different types of test stimuli will be systematically loaded for different types of test stimuli as a function of deception or truth-telling in response to the relevant target stimuli. Because there is no convenient signal that can serve as a perfect deterministic observer (immune to random variation and unaffected by human behavior) for deception and truth-telling, and because human physiology and psychology are known to be noisy sources of data, polygraph test stimuli are presented multiple times so that the data can be aggregated together to improve the signal to noise ratio and observe the pattern of response to the different test stimuli. Test data can be interpreted as supporting a conclusion that responses are loaded onto one type of test stimuli and not the other when the observed test data differ from a theoretical distribution of random data at a statistically
significant level. The level of statistical significance can be described using a p-value or other statistic. **Mystery of p-values (what they are not)**

P-values have also become central to some confusion and misunderstanding about their meaning, role and value in the scientific process. Following is short list of common and easy errors regarding the p-values:

- A p-value is not the probability that the null hypothesis is true
- A p-value is not the probability that an alternative hypothesis is false
- A p-value is not the probability that the observed data is merely a fluke or spurious event
- A p-value is not the probability of falsely rejecting a null-hypothesis
- A p-value is not the probability that replication will produce the same result
- A p-value is not the level of significance
- A p-value is not an effect size, it does not describe the strength of an observed result or conclusion
- The compliment of a p-value (1-p) does not describe the strength of an observed result or conclusion.

All of these may be easy and tempting things to assume about a p-value. But they are, for better or for worse, incorrect. A p-value is simply the probability of obtaining a result equal to or greater than what was actually observed, assuming that the (null) hypothesis under consideration is true. Most often, an experiment will be designed to test the strength of evidence for the null-hypothesis. When the null-hypothesis can be rejected, the evidence can be said to support the hypothesis.

One primary reason for misinterpretation is that the p-value does not itself describe the evidence for the hypothesis. In formal terms, a p-value describes the evidence for the null hypothesis. A low p-value means that either: a) the null-hypothesis is false or b) an unlikely event has occurred. In practice, when conducting null-hypothesis significance tests, either a null-hypothesis is rejected or it cannot be rejected. When the null-hypothesis is rejected, the evidence can be said to support the hypothesis. But p-value does not describe the strength of evidence for the hypothesis.

An important aspect of null-hypothesis significance testing is the requirement for an arbitrary probability cut-score as indicative of statistical significance. For example: why is p = .05 statistically significant while a p = .06 is not significant? Answer: because significance is an inference, and it is the alpha (α) level or tolerance for error, not the p-value.
that determines the level of statistical significance (i.e., the level at which \( p \) will be interpreted as statistically significant).

In addition to their use with a theoretical random distribution, \( p \)-values can be used in in the polygraph context with empirical distribution of scores from a reference samples of guilty and innocent cases. When the probability (\( p \)) for an empirical reference distribution of guilty scores is equal to or less than a required threshold (\( \alpha \)) for statistical significance, a hypothesis can be rejected that the observed data are from the population represented by the guilty reference distribution. Similarly, using an empirical distribution of scores from a reference sample of innocent cases a \( p \)-value could describe the probability (\( p \)) of obtaining a test scores equal to or more extreme (i.e., lower) than an observed test score. When the probability is equal to or less than a required threshold (\( \alpha \)) for statistical significance, a hypothesis can be rejected that the observed data are from the population represented by the innocent reference distribution.

One problem with \( p \)-values is that they may have become over-emphasized in the pursuit of publication of “interesting” or “significant” findings. This has resulted in a condition in which experimenters might be tempted to engage in “p-hacking” or testing numerous hypothesis until they find something that satisfies the \( \alpha = .05 \) threshold. Related to this is the fact that a \( p \)-value is in part a function of sample size; given a sample large enough small effect sizes can become statistically significant. Over time, problems may have contributed to a form of publication bias, in which significant results have been more likely to be published and non-significant results less likely to be published. Unpublished non-significant findings that describe ideas that do not work may contain a lot of interesting and useful knowledge. Related to this is the phenomena where the over-publication of results that are statistically significant at the .05 level might actually mean that substantially more than 5% of the published significant findings might actually fail to replicate. Indeed mathematical simulations have shown that the false discovery rate can easily exceed the .05 level of statistical significance.

Perhaps the biggest problem, and greatest abuse, with \( p \)-values is the impulse for untrained individuals to misinterpret or misrepresent \( p \)-values as an effect-size. An effect-size is a measurement or estimate of the strength of an effect (hypothesis or conclusion). \( P \)-values are an estimate of measurement error, not an estimate
of effect or classification error. In other words: the p-value is an estimate of the probability or proportion of results at the observed level if the data are a measurement of reality under the null-hypothesis. The p-value does not estimate probability of the results at the observed level under the (alternative) hypothesis, and does not estimate the probability that a hypothesis or conclusion is correct.

The most common and simple error when using p-values in the polygraph testing context is to misrepresent the value of 1-p as indicative of the strength of a conclusion. For that we will need some additional algebra using Bayesian inference.

The p-value was not initially meant to be used as it is today

Ronald Fisher, when he introduced the idea of a p-value did not mean for the test to be a definitive solution in the way it has become misused today. Prior to the widespread use of statistics in the sciences the term “significant” would have meant that a hypothesis or conclusion was worthy of further consideration. The idea of the hypothesis test was to evaluate a hypothesis by setting up an experiment to test the null-hypothesis – what would happen if the data and result were merely the result of random chance? Conduct the experiment and calculate the p-value under the null hypothesis. If the result is not likely to occur due to random chance then the hypothesis might be worthy of further consideration.

Misunderstanding and misuse of p-values has led some publications to take the extreme step of banning their use in favor of other statistics, notably effect sizes and statistical confidence intervals. Misuse and misrepresentation of p-values have led to the publication of a suggestion by scientist Charles Lambdin of Intel Corporation (2012, Theory and Psychology) that the basic practice of hypothesis test should be renamed to “statistical hypothesis inference testing,” possibly for the acronym it would produce. Others have likened p-values to mosquitos – annoying and impossible to swat away.

Despite the potential for misunderstanding and abuse, p-values are fundamental to the practice of hypothesis testing (null-hypothesis significance testing). Much of the controversy surrounding p-values is that for untrained persons they can seem complex like astronomy or rocket-science, and can be vulnerable to oversimplification and misunderstanding unless one takes the time to become familiar with their meaning and use. A related problem is that the basic concept of null-hypothesis
esis significance testing is thought by some to be inherently counterintuitive and vulnerable to misinterpretation. Indeed, many individuals will intuitively want to describe the strength of the results of an experiment or test with regard to their conclusion or classification, not the opposite. In contrast to the tradition of null-hypothesis significance testing and p-values, Bayesian analysis can allow a more intuitive discussion in that it can be used to more directly test the strength of evidence for different hypothesis. Bayesian analysis can also be vulnerable to misunderstanding, and will have to be the subject for another paper.
I had the great fortune to receive a review copy of this book and would like to share my thoughts in hope of interesting readers in increasing their knowledge of the burgeoning field of cognitive approaches to credibility assessment. The text boasts a list of some of the leading and most respected contributors and researchers in their respective fields from multiple countries including the USA, describing recent findings in these areas. This book is a part of the Wiley Series in the Psychology of Crime, Policing and Law which is dedicated to consolidating and publishing on current trends and findings in the associated literature. The series is geared towards the practitioner as much as it is towards researchers. The stated goals of the series is to take findings from basic research and apply it to real world problems with a goal of providing guidance to those who practice in the field and make policies for the field.

Each chapter is written by a leading researcher in the field addressed. The au-
thors lay out the issues to be addressed, review literature on the subject, attempt to describe overall findings, discuss known limitations and make recommendations for application and future studies. The book is thoughtfully divided into three sections: Section 1 is Deception Detection; Established Approaches, Section 2 is Current Challenges, and Section 3 is Improving Lie Detection: New Approaches. Within each section, chapter authors tackle aspects relating to the section. Each chapter is replete with a comprehensive reference list. I will list each chapter and the authors, provide an overview and my opinion of material covered as it relates to credibility assessment practice.

Section 1, Deception Detection: Established Approaches

Chapter 1 begins with Aldert Vrij writing on Verbal Lie Detection Tools. He comprehensively covers Statement Validity Analysis (SVA), Criteria Based Content Analysis (CBCA), Reality Monitoring (RM) and Scientific Content Analysis (SCAN). Anyone familiar with Professor Vrij knows he pulls no punches when it comes to factual analysis of findings and literature. His writings in the area of credibility assessment are some of the most important to date. In this chapter he describes each tool, including the history behind it, a good description, the supporting, non-supporting or lacking research findings and a summary. I especially appreciated his concise and thorough review of the SCAN tool, as it is taught here in the United States and reported to be applied often in criminal investigations. Professor Vrij points out the SCAN is not scientific, a-theoretical and has no theoretical justification for the underlying construct validity. In fact, a number of the criteria assessed by the SCAN method are completely opposite of those from the validated CBCA. He closes by stating: “Research has yet to demonstrate that SCAN actually works.” This closing comment raises the issue of questionable diagnosticity and should be food for thought for the investigator when comes the time of choosing a credibility assessment tool.

Chapter 2 “New Findings in Non-Verbal Lie Detection” is written by C. Bond, T. Levine and M. Hartwig. These authors focus on non-verbal cues to detecting deception which are possibly the most informative, yet least researched areas of credibility assessment. They provide a review of theoretical history and empirical evidence for non-verbal cues. They then review contemporary research on deception judgements and detection accuracy. Anyone interested in our field should read this chapter as it can really help understand the difference between subjectively reported and objectively used cues. It also offers a prescriptive view on improving deception detection strategies and training.

Chapter 3 “The Polygraph: Current Practice and New Approaches” by E. Meijer and B. Verschuere is perhaps the only disappointing chapter in the book. Seven of the seventeen pages of Chapter 3 deal with the authors’ preferred technique, the
Concealed Information Test (CIT). They provide a consolidated review of the literature on the CIT, including the poor performance reported in field testing. For a more comprehensive review of the CIT see the Verschuere, Ben-Shakhar & Meijer (2011) CIT treatise “Memory detection: theory and application of the Concealed Information Test.” Surprisingly, the other ten pages in the chapter are used to disparage the Comparison Question Test (CQT) with an unbridled uneducated bias. The chapter completely eludes recent research and peer-reviewed publications upon the CQT, including meta-analytic studies and even documented literature reviews such as that by Raskin in “Credibility Assessment” (Raskin, Honts & Kircher, 2014). In the end, this chapter may offer more to the epistemologist or sociologist of sciences interested in the study of human factors such as motivation and biases in science, than to the credibility assessment professional.

Chapter 4 was written by the well-known Professor William Iacono of the University of Minnesota. While Professor Iacono’s primary research interest is the study of mental disorders and addictions, he has researched and published extensively on credibility assessment tools, especially polygraph. His current chapter in this book is titled “Forensic application of Event-Related Brain Potentials to detect guilty knowledge.” The chapter brings the reader up to date on the state of the art of using ERP instead of autonomic responses in a CIT paradigm and gives case examples where ERP was shown to be successful. He provides a basic description of ERP, including the P300, and explains how it is used to monitor the salience of the target questions. Perhaps the best part of the chapter is how Professor Iacono thoughtfully discusses the two laboratories currently leading the development and testing of ERP in a CIT paradigm. Those two labs are led by Dr. Lawrence Farwell and Professor J. Peter Rosenfield. The former has a more commercialized approach, while the latter has produced the vast majority of research on the technique. The author highlights the benefits and contributions of both, notes potential limitations, but reserves negative attacks. He closes with suggestions on making better use of the technology in field settings and reminds the reader a positive finding is like finding a suspect’s DNA or fingerprint at the crime scene. As with the autonomic CIT, field research cautions us that a negative finding is relatively uninformative. He reminds us that the CIT is not going to be amenable to all criminal investigations but careful response by first responders and detectives can broaden its applicability.

Chapter 5 “Deception Detection using Neuroimaging” was written by G. Ganis. Credibility assessment practitioners and experts are often asked about alternative technologies, and usually neuroimaging comes up. This chapter is one of the best I have read yet at synthesizing the fMRI research on the topic. It includes concerns about the practicality of field use, the testing paradigm limitations and susceptibility to countermeasures. It also provides the standard basic overview of the
technologies for the reader. The author concludes that “the evidence suggests that current methods and paradigms are not even remotely suitable for field applications.”

**Section 2, Current Challenges**

The second section of the book deals with current challenges in the credibility assessment field, as its title suggests. It begins with chapter 6 “Exploring the nature and origin of beliefs about deception: implicit and explicit knowledge among lay people and presumed experts.” The authors, M. Hartwig and P. Granhag tackle the thorny issue of trying to get at just why current lie detection efforts fail. The credibility assessment field was treated to an epiphany in 2011 courtesy of a lens model meta-analysis of human lie judgement by M. Hartwig and C. Bond. These authors found evidence that supported the weak objective cue hypothesis over the wrong subjective cue hypothesis. They also found that people do not explicitly state the cues they actually use to infer deception judgements. In other words, if you ask someone what it looks like when a person lies, they report cues they actually don’t really rely most heavily upon to make deception judgements. This chapter takes the reader through that and other related research to help understand the difference between implicit and explicit cues used to make judgements about deception. They offer ideas on the origin of deception belief to help enable an understanding of why incorrect beliefs endure.

Chapter 7 deals with discriminating between true and false intentions. The authors, E. Giolla, P. Granhag and A. Vrij take a look at whether the techniques we use to try to assess lying in the past are applicable to lying in the future.

Chapter 8 written by P. Taylor, S. Larner, S. Conchie and S. van der Zee deals with cross-cultural deception detection. I found this chapter to be one from which I personally gleaned a great deal. I had not given the type of in-depth consideration to cultural differences in detecting deception. I have had trainings and read articles on cultural sensitivity, but had not truly considered the research and putative reasoning for the need to be culturally sensitive. The authors do a fine job of describing current research in cross-cultural behaviors and judgements relating to those behaviors. They discuss moderating factors like cultural acceptability of deception that translate into individual feelings and attitudes about lying. They include a review of the Global Deception Research Team 2006 study and relate it to behavioral norms of different cultures. An interesting moderator is the language the receiver is exposed to during the conversation and how that affects bias. Research suggests a lie bias for judging statements made in a second language. A very important finding is that cross-cultural deception judgments are improved by exposing the receiver to people from other cultures. Cross cultural bias seems to be reduced simply by exposing a person to the target culture. The chapter explores deception judgment errors related
to cultural roots and offers suggestions for mitigating the effects.

**Section 3, Improving Lie Detection: New Approaches**

Chapter 9 begins the section most readers will find helpful—techniques to apply in the field to improve performance and reduce mistakes. Aldert Vrij is one of the world’s leading authorities on the subject of “A cognitive approach to lie detection,” the title of this chapter. He has conducted extensive lab, field and literature research in this area. This chapter is a consolidation of a number of his earlier writings advocating a “cognitive load” approach to deception detection. By increasing the cognitive load a liar’s story may be less plausible, less detailed, have less of an overlap of details already known and a difference in the quantity and quality of detail between anticipated and unanticipated questions. These are some of the very cues lie-catchers implicitly rely upon when assessing statements. The author provides several suggested strategies to increase cognitive load and expected deception cues.

Chapter 11 is “The strategic use of evidence technique: a conceptual overview” by P. Granhag and M. Hartwig. This chapter not only summarizes the S.U.E. (one of the most successful, researched and promising questioning strategies) but describes the underlying reasons for how and why it works. The theoretical overview includes the suspect’s perspective of the evidence, the suspect’s counter-interrogation strategies, their verbal responses, and the interviewer’s perspective-taking on these. The conceptual overview guides the reader through the causal relationship of the S.U.E. principles. There is a well-written description of how and when to apply the S.U.E. tactics written in phases that each build upon one another. The chapter closes with some suggested themes for future use of the S.U.E. and discusses limitations.

Chapter 11 by G. Ganis is titled “Investigating deception and deception detection with brain stimulation methods.” It discusses using Transcranial Magnetic Stimulation (TMS) and Transcranial Direct Current Stimulation (TCDS) to stimulate parts of the brain could inform us on deception processes. The chapter describes the few (about ten) studies to date and their mixed findings. It closes with discussion of the ethics surrounding adjusting natural feelings associated with lying.

Chapter 12 is a very interesting review on a promising technology, Reaction Time (RT). The authors, B. Verschuere, K. Suchotski, and E. Debey provide an introduction to the concept of RT, a description of some of the conditions under which RT may be used to infer deception and some of the RT-based paradigms for detecting deception. B. Verschuere is arguably one of the foremost experts in the field of RT as applied to deception detection. He and his colleagues have adapted the RT to be able to be used in a CIT paradigm. Some of the benefits of RT is it can be administered remotely and
it takes about 10-15 minutes to conduct. The chapter also describes the Autobiographical Implicit Association Test (AIAT) which uses RT as an indirect attitude test. Some things people just don’t want to talk about truthfully or openly (e.g. their position on sexual orientation attitude, politics, abortion, etc.). The AIAT is designed to test for these things implicitly by asking associative questions (Muslim/Christian) and offering choices like “good/bad” for each. This can be adapted to detecting deception by pairing ‘True/False” answers with crime related statements. Studies showed the AIAT could differentiate truthful from deceptive statements at greater than chance levels.

Chapter 13 is a very interesting chapter titled “Suspect’s verbal counter-interrogation strategies: toward an integrative model.” The authors P. Granhag, M. Hartwig, E. Giolla and F. Clemens provide an introduction and background information on the concept of counter-interrogation strategies. This is a fascinating way to think about interrogations in terms of how truthful and deceptive people approach an interrogation. What are the different strategies with which they approach an interview and how do they each compare to one another? How do their plans and strategies effect how they disclose or manage information? The chapter reports on basic findings on counter-interrogation strategies from research and offers a causal model to consider. The causal model deals with suspect-related factors, such as their perception of the existing evidence (or to be developed evidence) and their experience with law-enforcement. There are also interview-associated factors to consider such as the degree of suspicion felt by the suspect and the type and number of interview/interrogation approach being used. Finally there are crime-related factors that are unique to any particular crime. This chapter causes one to reflect on the fundamental differences with which liars and truth tellers would approach an interview and ways to exploit those differences.

Chapter 14 is titled “Covert detection of deception” and was written by E. Elaad. The author describes some of the generally accepted underlying theories of deception detection. He does a nice job of summarizing the micro-expression technologies. He points out that a recent article in Nature (Weinberger, 2010) suggests scientists do not embrace the micro-expression data by the developer P. Ekman. In fact, the chapter goes on to state that scientists were unable to replicate the Ekman data. I found this interesting as many times people inquire on micro-expressions. There is a small section discussing polygraph and the CQT and CIT and the author does yeoman’s work of debunking the voice stress technology. He discusses eye-tracking technologies including; pupillary size and blink rates fixation durations. He only mentions the new technology developed at the University of Utah (EyeDetect) and omits discussing the research that supports this promising technology. He closes out with thermal imaging and a detailed discussion of covert
breathing movement measurements.

**Summary**

Overall this book is an excellent review of the state of most credibility assessment tools or techniques. With the exception of the woefully poorly documented and unbalanced review of the CQT in chapter 3, this book is a “must read” for researchers, practitioners and end-users in this field. For a balanced and complete review of the CQT, see the Raskin, Honts and Kircher book Credibility Assessment, Scientific Research & Application.

Some of the most useful information comes in the form of interview strategies shown to improve deception detection, while protecting the suspect from false admissions, turned false confessions, turned wrongful convictions. Moving toward a cognitive-based investigative interviewing versus a confession-focused strategy is at the heart of a number of these suggested improvements. Section 3 provides excellent suggestions that would further justice by helping to identify the culprit, while protecting the innocent.

All practitioners, researchers, and consumers could benefit from reading this book. It is an excellent reference for almost all items covered. As alternative technologies develop and improve, it behooves us to stay abreast and open-minded. One of the most promising technologies to date, EyeDetect, received only a brief mention in this book, possibly due to the author not having access to literature on the subject. As pointed out, other technologies (e.g. P300 CIT, Reaction Time, and EyeDetect) hold promise and have been used in real-world settings. Shuttering our minds to technologies and methods other than polygraph and interrogation-focused interviewing are likely to leave us behind. This new publication is another marker indicative of the rich and intense research effort deployed toward developing theoretically and empirically well founded credibility assessment methods that have high diagnostic value. I highly recommend this book to all examiners interested in improving their knowledge on cognitive approaches to interviewing, ethical interrogative strategies and avoiding false confessions.

**Reference**

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An Essay: Reporting Reproducible Results of Scientific Polygraph Tests

By Raymond Nelson

Results of scientific tests should be reproducible. Reproducibility of an analytic result is a differentiating characteristic between scientific tests for which test validity is based on the structured use of quantitative methods, and unquantified clinical evaluation methods for which the validity of a result will depend primarily on the subjective expertise and persona of the evaluator. Both reproducibility and replicability are related to the concept of reliability. Replicability is a scientific concern, and refers to whether the results of a scientific study can be reasonably expected to be observed again if a study were to be repeated with different sampling data. Reliability, in scientific testing, refers to repeatability – whether a particular test result can be achieved again. Discussions about reliability include both re-test reliability and inter-scorer reliability. Re-test reliability refers to the degree to which a test result will be observed again if a test is repeated. Inter-scorer reliability is an important concern whenever a test result is based on subjective feature extraction and whenever the analytic procedure will be completed manually. Reproducibility refers to whether an analysis of a dataset can be repeated to achieve the same analytic result.

Reproducibility of scientific polygraph test results will depend, in part, on the availability of information about the data aggregation and numerical transformation procedures that were used, in addition to the availability of information about the statistical reference models and decision rules. Quite obviously, re-analysis of polygraph test data with a dif-
Different analysis protocol (i.e., differences in feature extraction, data reduction and data aggregation, statistical reference models, or decision rules) will be more likely to result in a difference in the analytic conclusion. Differences in analytic conclusions will lead inevitably to confusion, frustration and distrust, especially among the most concrete thinking persons who may be un-prepared to think probabilistically about scientific test results. In the most extreme cases, persons who have not developed an adequate understanding of the probabilistic nature of all scientific test results may engage in indiscriminate pretense or expectation for deterministic perfection, and this will lead to eventual confusion and frustration when confronted with the need to understand testing errors.

**Conceptual content of a report of a scientific polygraph test result**

In order to educate and inform those who receive and read the results from scientific polygraph tests, and to promote the reproducibility of test results, reported information should be standardized. A polygraph report should include sufficient information about the method of analysis that an interested reader could access more complete information about the analysis and testing model. It should also include some information about the numerical test scores and cut-scores that were used to determine the test result. Reported information should also include some information about the probabilistic test result and probability decision thresholds, along with information about the use of any statistical correction to account for multiplicity effects when completing multiple statistical comparisons, such as those that can occur when using subtotal scores. A complete written report will also provide information about the meaning of the probabilistic test result with regard to other potential conclusions that have been rejected as a result of the testing process. Finally, a written report should contain clear information about the categorical test result whenever probabilistic test results are intended to be reduced to nominal outcome categories.

**Analytic method**

Reported results of scientific polygraph test should include a description of the analysis method, for which there should be some published description of the analytic procedures. Absent an adequate published description of the analytic method, professionals are at risk for ignoring or inventing procedures as a matter of convenience, and quality assurance reviewers will be unable to reproduce and verify the correctness of the analysis and result. When a result is un-reproducible the strength of the conclusion will be based on the persona of the expert who will undoubtedly claim to possess some deep magic or esoteric knowledge that is not available for scrutiny. A more satisfactory form of scientific conclusion will be achieved when the result is based on a published analysis method that is evidence-based, norm-referenced and standardized. Minimally, a test report should include enough information about the method of analysis so that an interested person could access and digest the published literature in order to ascertain whether the analysis was completed in a correct and competent manner.
Numerical test scores and cut-scores

Reported results of scientific polygraph results should minimally include the grand total or sub-total scores that were used to determine the test result. The report should also include information about numerical transformations, data aggregation, and data reduction. This can often be accomplished by simply identifying the scoring protocol, for which detailed information can be obtained in available publications.

Test results that are achieved with the use of numerical decision cut-scores should include information about those decision cut-scores. Cut-scores are a matter of both science and administrative policy, and are intended to achieve identified testing objectives such as achieving high levels of test precision or accuracy, or maintaining test sensitivity or test specificity at desired levels, or constraining false-positive or false-negative errors to below specified tolerances. Quite obviously, attempts to reproduce an analysis and testing result may be ineffective if decision cut-scores are unknown or different from those used in the initial analysis.

Probabilistic test results and probability cut-scores

Probabilistic test results should be provided in the written test report. Information in a written test report should also include information about the probability reference model or computational reference model so that an interested reader can obtain more information to answer questions about model and procedural validity. This can sometimes be achieved easily by identifying the analysis protocol. Test results based on frequentist inference will require the explicit a priori declaration of a tolerance for error, and testing reports should include information describing the probability cut-scores or alpha boundaries for statistical significance. Test results based on Bayesian inference will require an explicit declaration of assumed prior probability values for the possible test outcomes. Any use of statistical error correction should be clearly described if they are used to account for multiplicity effects that are anticipated when completing multiple statistical comparisons, such as when using subtotal scores to classify polygraph test outcomes. Absent any description, a reader will assume that no statistical correction was used to optimize the desired testing or mission objective.

Statistical and probabilistic results can be provided in a number of different ways, including through the use of p-values that describe the probability of error or level of statistical significance, or through any of number statistical descriptions of the estimated effect size or strength of the testing evidence such as odds, ratios, odds ratios, risk ratios, confidence intervals, proportions, probabilities or confidence levels. There may be advantages and disadvantages to the use of different statistics. Regardless of the type of statistical information that is presented, expert professionals should be expected to achieve some familiarity with the meaning of various statistical terms.

Explanation of the realistic meaning of the test result

A report of a scientific polygraph test should include a statement describing the practical
interpretation that can be made from the probabilistic test result. This statement of explanation should answer the following question: what can be reasonably said in verbal language regarding the probabilistic test result? Interpretation of any scientific test will always be premised on a recognition that all knowledge is yet incomplete and all scientific conclusions are relative to some clearly identified alternative. For this reason, a correct interpretation or explanation of the test result will factually describe the meaning of the probability result with regard to both the observed test data and the alternative possible conclusions that the examiner set out to choose from.

In the case of a scientific polygraph test that is scored and interpreted using empirical reference distributions – calculated from empirical observation of the sampling scores of deceptive and truthful cases – the different possible conclusions may involve deception and truth-telling. A conclusion that the test data are indicative of truth-telling will be considered against the possibility that the data and conclusion are erroneous and were produced by a deceptive person. Similarly, a conclusion that the test data are indicative of deception will be considered against the potential that the data are erroneous and were produced instead by a truthful or innocent persons. In scientific decision making, a conclusion is acceptable when we have made reasonable efforts to show that we have quantified the possibility of a different possible conclusion as sufficiently low.

Polygraph test results that are calculated using Bayesian methods, involving a declarative prior assumption of the probability of deception or truth-telling, can be used to mathematically update or modify the prior probability. The result will be a posterior probability of deception or truth-telling. In addition to their well-established usefulness, results from Bayesian method can also offer an advantage in that the conceptual explanations of these results are sometimes be more easily or intuitively understood by persons not trained in frequentist inference.

**Categorical test result based on the probabilistic test result**

All scientific tests are fundamentally probabilistic. However, professionals who make referrals for testing, and others who receive the results from scientific tests, may find it more practical and convenient to work with categorical test results. In overly sim-
plastic terms, categorical test results can be thought of as either pass or fail. Categorical results in the polygraph testing context might simplistically conclude that an examinee has told a lie or the truth, but this type of over-simplification can tend to encourage a number of overly concrete and problematic expectations for determinism or deterministic perfection. In response to both intuition and objective evidence that polygraph results are in fact non-deterministic (i.e., they are probabilistic), polygraph professionals have adopted a practice of making categorical interpretations of diagnostic polygraph test results using the abstracted terms deception indicated or no deception indicated. The terms significant reactions or no significant reactions have also been used, and these abstracted terms are equivalent to the former for practical purposes. All of these terms are contextual analogs of the more abstracted scientific terms positive or negative that are used to avoid the imposition of personal values onto conclusions that expected to refrain from subjective judgement. Most importantly, the use of abstracted categorical descriptors for scientific polygraph test results will remind readers of test reports that test results are a probabilistic conclusion and not a form of deterministic observation or direct physical measurement.

Regardless of whether described using concrete, contextualized, or abstracted categorical labels, the practical meaning of different categorical description schemes remains the same. Categorical results of scientific polygraph tests are based on probabilistic results that are based on a structured and reproducible analysis of the test data. The polygraph report should contain a clearly stated conclusion about whether a categorical conclusion is supported by the probabilistic analysis of the test data. In this way, overly-simplistic impulses to suggest that the polygraph can measure or detect lies directly – or to criticize the polygraph test because it cannot – can be either avoided or more easily recognized as a fallacious and unrealistic attempt to impose concrete expectations onto a probabilistic test result.

**Summary of information for a reproducible polygraph examination result**

Reproducible results of scientific polygraph tests are those that are based on data analytic methods that are published and available, and for which sufficient detail is included in the test report so that others who repeat the analysis of the test data are likely to reach the same analytic conclusion. Adequate detail in a scientific test report will also enable an intelligent and educated reader to have reasonable answers to the common types of questions that are asked about scientific test results. A complete and adequate polygraph examination report will serve to document both the analytic conclusion and the analysis parameters (i.e., reference, model, assumptions, probability cut-scores, use of statistical corrections) that were used to achieve that conclusion. A written report of a scientific polygraph examination result should include the following pieces of information:

- Name and description of the validated method used to score and interpret the test result
- Numerical test scores and cut-scores if these are used in the classification of the
test result
• Probabilistic test results and probability cut-scores including statistical error corrections
• A statement of interpretation to describe the practical meaning of the probability results
• A statement describing the categorical test result that is supported by the analysis

In addition to the test result, a complete polygraph examination report will also include information about the examinee, referral question or reason for testing, information from the polygraph interview, test questions and answers, testing and recording instrumentation. Inclusion of probabilistic information in polygraph examination reports will foster realistic expectations and reduce confusion and aggravation when people are reminded that the results of polygraph examinations are imperfect. If probability results are not clearly explained in written polygraph examination reports, it will serve only to encourage perceptions that the polygraph result is not an objective analytic process and is instead subjective – which introduces a vulnerability to subjective human bias. Subjective test results will be inherently less reliable, and therefore less desirable, than objective test results.

Much of this suggested information is already provided in many written reports of polygraph examination results. The inclusion of statistical information served to anchor and account for the probabilistic test result, and to improve the reproducibility of the analytic conclusion. Some field examiners, and perhaps some referring professionals, may be uncomfortable reporting and discussing scientific and statistical test results. Or perhaps there is discomfort in the acknowledgment of reality when discussing the potential for testing errors. Regardless, polygraph examiners who wish to claim professional expertise beyond that of an operator or technician will be obligated to learn to communicate the principles of science and scientific testing, including probability and decision theory.

A complete and satisfactory polygraph report should also include information about any constraints or limitations that might be regarded as capable of limiting the strength of the analytic, probabilistic and categorical conclusions. Such limitations might involve the medical, developmental, or psychological status of the examinee, or might involve the interpretable quality of the test data. Additionally, polygraph professionals should be careful not to misrepresent or abuse statistical concepts. For example: p-values are not an effect size. That is to say, p-values do not describe the magnitude of the observed result or level of confidence in the result. P-values only describe the expected proportion of times we expect to observe a similar test result if another data distribution is a more correct representation of the population from which the examinee is from. P-values are sometimes thought of as a probability of error when we select a particular explanation or conclusion, and reject another possible conclusion or explanation, but are formally defined as the proportion of times we would expect to see a similar experimental result under numerous repetitions of an experiment if a (usually null) hypothesis is a true or reasonable description of reality.
Discussion

Scientific test results, like the results of scientific studies, should be reported in sufficient detail such that another professional can fully understand the test result, and can reproduce the analysis and result if desired. Although not a complete verification of a test result, reproducibility of polygraph test results is fundamental to other forms of verification and validity, including quality assurance activities. Analytic results of a scientific polygraph test cannot be assumed to be a valid indicator of reality if they are not at first reproducible. In other words, if different professionals analyze the data to different conclusions using the same analysis methods, then the results cannot reasonably be argued to be a reliable indicator of reality. If unreproducible test results happen to also be correct then it is convenient, but it is nonetheless spurious.

When examiners neglect to include scientific and statistical explanations in polygraph test reports the effect will be an impulse to establish the validity of a test via social mechanisms such as bravado, simplistic hyperbole, expertizing, and credentializing. These are neither synonyms nor substitutes for scientific validity, and the result can be overconfidence in a uncertain conclusion. Inclusion of statistical information in the reports of scientific polygraph exams will remind all professionals that scientific test results will always include some potential for error. Moreover, inclusion of statistical information, regarding both test scores and probability cut-scores, will provide continuous reinforcement of professional and social knowledge that the polygraph test is a scientific test – that test results are not derived through an over-simplified social heuristic that may or may not be supported by scientific evidence but which would undoubtedly be more subjective than quantitative analysis of recorded test data.

Reinforcement of probabilistic awareness and the concepts of science and testing

The most important reasons to provide scientific and probabilistic information in polygraph test reports is to reinforce a continuous awareness of the fact that scientific tests are fundamentally probabilistic and are not expected to be perfect. Without this type of continuous awareness the polygraph profession is likely to experience continued unwarranted frustration over the fact that results of scientific polygraph tests, like the results of all other scientific tests, are imperfect conclusions regarding some amorphous phenomena that cannot be evaluated through simple and perfect deterministic observation nor through direct physical/linear measurement. The polygraph profession is also likely to continue to observe a continuous stream of individuals who attempt to assert the fallacious argument that the polygraph is invalid or unscientific simply because there is no single physiological, behavioral, or psychological phenomena that can be exploited to achieve perfect deterministic observation or direct physical measurement of deception or truth-telling, with the implication, either explicit or covert, that the polygraph is merely a bogus pipeline prop. These false and unrealistic arguments neglect the fact that virtually all scientific tests work as a function of some combination of proxy signals that are correlated with an amorphous phenomena of interest but are not them-
selves the phenomena of interest.

Scientific tests are expected only to quantify the margin of uncertainty surrounding a result or conclusion and to help constrain decision errors to within identified tolerances. Tests are expected to do this in a structured and objective manner for which the results can be demonstrated to be reliable. Reliability is established, in part, when repeating a testing procedure or analysis can be expected to reproduce a probabilistic result within some desired tolerance for uncertainty.

**Reliability of test results**

Test reliability, related to the reproducibility of analytic results, has been a discussion topic for many years among those who develop and use scientific tests, and has included discussions about re-test reliability and inter-scorer reliability. Questions about re-test reliability will address whether the acquisition and analysis of new testing data from the same individual will lead to the same analytic conclusion. In contrast, questions about inter-scorer reliability will address the degree to which or likelihood that different professionals will achieve the same conclusion using data from a single test administration. Similar to the way that the reliability of test will constrain the validity of a test (i.e., a test cannot be valid if it is not reliable), re-test reliability will be constrained by inter-scorer reliability (i.e., we cannot expect to consistently achieve the same result upon re-testing if we cannot first achieve the same result when different professionals analyze the same data). Increased availability of automated computer algorithms for analyzing polygraph test data could potentially reduce or even eliminate concerns about inter-scorer reliability.

Results of automated computer algorithms are inherently reproducible as long as the input data and the analysis parameters are known. A satisfactory polygraph examination report will serve to document the analysis parameters regardless of whether the analysis was completed through a manual scoring rubric or automated computer algorithm.

Computerized algorithms can be useful not only to analyze test data, but also to produce satisfactory and complete reports of the test data analysis and test result. Use of computerized analytic and reporting tools can serve to increase the consistency and correctness of the content of scientific polygraph examination reports, and can also serve to disseminate correct information to polygraph professionals and others who are interested in understanding the meaning of scientific test results. The automated re-scoring reliability that computer scoring algorithms can provide could enable test development and validation efforts to be more fully devoted to the refinement of testing procedures to improve the consistency of test administration and corresponding re-test reliability.

For some forms of testing manual and automated analysis protocols may produce the same statistical or probabilistic results. For example: a psychometric test involving forced choice or multiple choice test items can produce the same numerical and probability scores regardless of whether machine scored or manually scored. Because manual analysis of polygraph time-series data has been traditionally accomplished through
subjective visual extraction of physiological reactions, polygraph results based on protocols for manual test data analysis have remained inherently less reliable than the results from automated computational machines. This places inevitable limits on the level of validity that can be achieved, simply because a test can be no more valid than it is reliable. A testing procedure and analysis method must first produce reliable outcomes; then we can begin to make realistic conclusions about the relationship between those outcomes and reality.

One fact bears reminding at this point: continued use of manual analysis methods for polygraph test data may become increasingly problematic in the future. This is because we are likely to continue to observe the development and commercialization of more objective automated scientific technologies for lie detection and credibility. The polygraph will be at risk for becoming an anachronism if the it continues to rely on subjective visual feature extraction and simplified heuristics while neglecting the development and use of more objective and more powerful statistical and computational methods. Algorithms based on statistical and machine learning principles should be more fully developed and integrated into the analysis of polygraph results. Until algorithm or machine scoring methods are more completely integrated into field practices, the continued use of manual test data analysis protocols will mean that analytic results of polygraph test data will remain subjective and more highly variable than necessary. Increased use of automation and computerized analysis methods can increase the reliability of polygraph outcomes, and can ultimately lead to increases in test accuracy.

Arguments against the inclusion of analytic details in polygraph test reports

Inclusion of probability information into polygraph reports is an explicit acknowledgement regarding the unavoidable reality that there is some potential that a test result is incorrect. Some may be uncomfortable with this acknowledgment. Others may suggest that readers of polygraph examination reports are not intelligent enough or have no interest in scientific or probabilistic test results. Still others may attempt to assert that readers of polygraph examinations report are not entitled to probabilistic and scientific information regarding the test results. These views are both shortsighted and parochial. Neglecting to include scientific and probabilistic information in polygraph reports appears to underly some of the most common criticisms against the polygraph: that the test may be overly subjective and unscientific, or may be based on pretense that is not consistent with reality, or may have some fundamental scientific flaw to conceal. Another common criticism – based on a misguided expectation for perfection – is simply that the polygraph should not be used because it is not infallible. This criticism neglects the fact that scientific tests are not expected to be perfect or infallible, and neglects the very purpose of scientific tests: to quantify in some replicable manner a phenomena that cannot be subjected to perfect deterministic observation or direct physical/linear measurement. All scientific test results should be reported in a manner that reflects the fact that the purpose of any scientific test is to quantify the margin of uncertainty surrounding a
conclusion about some amorphous phenomena.

All test results are fundamentally probability statements. In the case of a scientific polygraph test, the test results might be understood as meaning that the examinee is probably truthful or probably deceptive. Because they are probabilistic and non-deterministic, all polygraph results are at once probably correct and also probably incorrect. Ideally, the probability is high that the results are correct, with a corresponding low probability that the results are incorrect. Polygraph examiners are permitted to render a professional conclusion about deception or truth-telling when they acquire data and can provide a reproducible analysis showing that these probabilities satisfy our stated needs or are within established probability tolerances. For convenience and simplicity, field examiners and other professionals will, to some degree, omit the “probably” part when writing and communicating polygraph test results. When there is an absence of probabilistic discussion and awareness surrounding polygraph examination results it will tend to encourage misguided expectations for perfection, and this will lead to unnecessary and avoidable misunderstanding and frustration when a testing error inevitably occurs.

When people persist in maintaining naive and unrealistic misconceptions that polygraph test results should be infallible, they may attempt to incorrectly attribute all test errors to one of two causes: deficiencies in competency on the part of the examiner competency, and faking or subterfuge on the part of the examinee. The subscript of these attributions is a persistence of misguided and naive expectations that the polygraph test itself can be regarded as perfect if given a competent examiner and cooperative examinee – despite the fact that the requirements for competence and cooperation merely illustrate the potential for test imperfection. To the degree that procedural error is a cause of testing error, automation of testing procedures can be expected to reduce testing errors. However, it would be unwise to expect that a completely automated test administration would mean that all errors could be attributed to faking. A small proportion of errors can be expected even in the absence of procedural error and faking. Scientific tests are expected to provide an estimate of this potential.

The pervasiveness of expectations for perfection has been such that polygraph professionals have sometimes routinely endorsed these expectations, either deliberately or inadvertently, with statements such as “I don’t like to ever get beat.” Embedded in this type of statement is a message that the polygraph may be more interpersonal contest (mano-a-mano) than scientific test. This sentiment is premised on the false assumption that a probabilistic test will somehow never produce an erroneous result if it is simply administered correctly, and also implies that a testing errors can only be the result of the superiority and inferiority of the participation of those involved. These perceptions neglect the reality that the results of valid scientific test results are usually correct because of probability theory, and the corresponding reality that the results of any valid scientific test might be incorrect on some smaller proportion of occasions due to random chance alone. In other words, a quantifiable proportion of testing errors
can be expected to occur regardless of any procedural error and regardless of sophisticated subterfuge. Perhaps equally problematic, this type of statement encourages polygraph professionals to personalize (i.e., to view it as a personal failing) the existence of occasionally unavoidable testing errors. Once again, scientific tests are not expected to be perfect, and are intend only to quantify the probability of decision error so that we can reduce its occurrence to within stated tolerances. Research on test validity and test accuracy are expected to answer this: given that all test are imperfect, and given that some persons attempt to alter the test outcome, and given that there is some variability in functional characteristics, what proportion of test results can be expected to be correct or incorrect?

If the polygraph is a form of interpersonal contest and not a scientific test then polygraph professionals would be wise to divest themselves of the burden and constraints of scientific expectations and the need to understand abstractions such as alternatives and probabilities. Instead, if the polygraph is an unscientific interpersonal contest then polygraph professionals should merely train and develop themselves to win the contest, and the polygraph profession should be designed to filter and consume professional talent in the same manner as professional baseball. Major League Baseball teams are surrounded by layers of infrastructure intended to identify and develop human talent beginning at young ages and continuing through the various ranks of amateur, semi-professional, minor-league and major league environments. But even the world of professional baseball has resorted to quantification and probabilistic modeling as a way to optimize desired performance outcomes. Today it would seem today that the principles of science and probability theory are used virtually everywhere. If the polygraph is a scientific test and not merely an interpersonal contest, or a bogus-pipeline prop, and then it should be an obligation for polygraph professionals to learn to think probabilistically and to communicate probabilistic test results as well as categorical test results.

Regardless of whether the polygraph is a personal contest or scientific test, the bottom line is that expectations for perfection cannot coexist with reality and cannot coexist with science. This is because science is about trying to understand reality. Because humans probably cannot ever achieve perfection and probably cannot ever know everything about reality and the universe, in the end, due to these fundamental human limitations, all forms of human knowledge and all conclusions are an approximation of reality. The goal of science and scientific testing – including scientific polygraph testing – is not to pretend perfection or infallibility where these are not possible, and not to pretend that we know the universe or reality with certainty. The goal of science, including scientific polygraph testing, is merely to solidify our probabilistic approximation of reality in a manner that is less likely to be spurious and more likely to be reproducible or replicable.

Conclusion

Professional opinions and professional conclusions are those that are based on data and evidence. Professional opinions that are not based on structured and replicable
evidence are clinical methods for which the validity depends heavily on the subjective persona of the professional. Subjectivity will mean that the conclusions are wide open to alternative subjective interpretations by other professionals. When different professionals do not agree, and when there is a need for a conclusion, the ultimate determination will depend on a form of contest oriented around the social popularity or political weight of the different professionals. This form of decision making will be at risk for becoming disconnected from any form of reality that can later be supported by evidence. Criticisms that the polygraph is unscientific and invalid may begin to carry deserved weight if polygraph results are not reproducible and reliable.

Effectively written polygraph examination reports will served to correctly describe the scientific basis for the polygraph test. Effective communication of test results will educate others about how to understand both the practical and probabilistic meaning of scientific test results, and will inoculate readers against naive and unrealistic expectations that polygraph accuracy rates should somehow approach deterministic perfection. Whereas some fields of science and technology will involve margins of error and uncertainty that are so small that some individual professionals may never witness a failure, the ratios of diagnostic and error variance in the areas of human psychology and human physiology are such that many professionals can expect to occasionally confront the possibility of observing or experiencing a testing error. When errors can be reasonably expected to occur and when the professional culture creates an illusion that errors are intolerable, the result will be that field practitioners and others may experience a massive impulse to hide testing errors in order to ensure their own professional survival.

The manner in which polygraph professionals think about test results will both influence and be influenced by how they report test results. It will pervade and influence everything we assume, express and communicate. It will also influence everything we do in the acquisition and recording of the test data itself. Similarly, the manner in which polygraph professionals report test results will both influence how other professionals think about polygraph test results. If we want others to more clearly and more correctly understand polygraph results and the scientific based for the polygraph, then it will first be important for polygraph examiners to communicate the test results more effectively. In order to communicate the results more effectively it will be necessary for polygraph professionals to learn to think more clearly about the scientific and probabilistic basis of the test results. At times, the ability to clarify or improve our thinking is contingent upon our willingness to engage in self-reflection and critical analysis of the language and logic that define our present knowledge, assumptions, and field practices.

Polygraph field examiners will help to ensure their own useful future by reporting test results in a reproducible manner, including information about the categorical and probabilistic test results, and the method and parameters for analysis. Reporting information in this way will reduce and dispel criticism that the polygraph test is unscientific and will reduce misguided and naive
expectations for deterministic perfection or physical measurement where these are not possible. The polygraph profession will be wise to plan its future on the provision of scientific test results that are based on data and evidence for which validated and structured probability models can be used to provide test results that include reproducible estimates of the potential for testing error. Of course, if the polygraph were infallible then there would be no need to account for any potential for testing error.

“We cannot solve our problems with the same thinking we used when we created them.”

Albert Einstein
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Subsequent to Ruby's apprehension, he was given a polygraph examination by the FBI in which he denied that he had been involved with any other person in killing Oswald, or had been involved in any way in the assassination of President Kennedy. The Warren Commission stated it did not rely on this examination in drawing conclusions, although it did publish a transcript of the examination. The FBI in 1964 also expressed dissatisfaction with the test, based on the circumstances surrounding its administration. A panel of polygraph experts reviewed the examination for the committee and concluded that it was not validly conducted or interfered. Because there were numerous procedural errors made during the test, the committee's panel was unable to interpret the examination.

Here is the full report of the House Select Committee on Jack Ruby's polygraph examination, from HSCA Hearings Vol. VII, pp. 197-222.

**THE ANALYSIS OF JACK RUBY'S POLYGRAPH EXAMINATION**

Submitted by


Report to the Select Committee on Assassinations
U.S. House of Representatives
INTRODUCTION

(1) On July 18, 1964, Jack Ruby voluntarily took a polygraph examination to test his truthfulness. Even though the Warren Commission disclaimed any reliance on the results of the test, (1) the committee believed that popular interest in such tests, as well as the possibility that new investigative "leads" might emerge, warranted a review of the examination.

(2) The committee was specifically prohibited by its own rules (2) from using either failure or agreement to take a polygraph examination, or the results of a polygraph examination, as a basis for fact-finding in any public hearing or report. Such restrictions did not apply, however, to a review of polygraph tests previously administered. The committee therefore engaged a panel of experts to review the Ruby polygraph examination to determine if it was properly conducted and analyzed.

A polygraph examination

(3) A polygraph examination records physiological responses to questions asked. The polygraphist attempts to design the examination in such a way that the truthful person will react to the control questions and the lying person to the relevant questions.

(4) The test structure must be constructed so that it poses a threat to both the truthful and untruthful person. The polygraphist attempts to determine the "psychological set" of the examinee. He tries to determine, by reading the physiological activity of the examinee in the polygraph charts, what questions or question areas pose the greatest threat to the examinee's well being. A "psychological set" is "a permission disclaimed any reliance on the results of the test, (1) the son's fears, anxieties, and apprehensions, [which] are channeled toward that situation causing the greatest threat to the individual's well being. He will tune in on that which is of a greater threat, and tune out that of a lesser threat." (3)

(5) Responses to questions are recorded on a polygraph chart, which consists of tracings produced by three different types of psychological reactions associated with the circulatory, nervous, and respiratory systems:

(6) 1. The breathing pattern is recorded by means of a rubber tube placed around the person's chest.

(7) 2. The Galvanic skin response is measured by placing the attachments on either the fingers or the palms.
(8) 3. Changes in blood pressure, heart beat and pulse rate are obtained by a standard blood pressure cuff placed around the upper arm.

(9) Questions are broken down into three categories:

1. Relevant--those pertinent to the investigation.
2. Irrelevant--hopefully meaningless, nonemotion-producing ones to get the person used to being questioned and giving answers.
3. Control--nonrelevant to which it can be assumed the person will lie during the test. These provide a standard for comparing the responses to relevant questions. If a person reacts more to a proper control question than to the relevant questions, then he is considered to be truthful to the relevant. On the other hand, if he reacts more to the relevants than to the proper control question, he is considered to be lying to the relevants.

(10) Relevant, irrelevant, and control questions are interspersed throughout the polygraph chart. The examination may consist of various series covering various relevant issues. Each relevant issue must be asked a minimum of two times in a series, but as many times as necessary to conclude that relevant issue successfully. Each series should have a minimum of two charts, but as many charts as necessary to conclude the relevant issues in that series successfully.

(11) The procedure for a polygraph examination is as follows. The polygraphist first conducts a pretest interview, during which the test questions are read to the person exactly as they are going to be asked. It is vital that all questions be properly worded and discussed with the person. Then the actual test is conducted.

Ruby's polygraph examination

(12) Jack Ruby had repeatedly requested that he be examined with a polygraph, truth serum, or other scientific means to test his veracity.(4) In his testimony before the Warren Commission fission on June 7, 1964, he stated, "I would like to be able to get a lie detector test or truth serum of what motivated me to do what I did at that particular time * * *."(5) Chief Justice Earl Warren responded,

"* * * if you and your counsel] want any kind of test, I will arrange it for you. I would be glad to do that, if you want it. I wouldn't suggest a lie detector test to testify the truth * * *.(6)

Ruby repeated his request several times during his testimony.

(13) Following numerous discussions among attorneys for Ruby and his family and other interested parties,(7) on July 18, 1964,(8) Ruby(9) took the examination signing a standard "Consent to Interview with Polygraph" form. (10)

(14) The following persons were present during the examination, in addition to the
expert, SA Herndon: (11)

1. Arlen Specter, Warren Commission counsel;
2. Clayton Fowler, Ruby's attorney;
3. William R. Beavers, Ruby's psychiatrist;
4. James Woods, FBI special agent;
5. E. L. Holman, chief jailer;
6. Odell Oliver, court reporter.

(15) In addition to the above, Joe Tonahill, Ruby's other attorney, and William Alexander, assistant district attorney for Dallas County, Tex., were present at each of the 13 pretest interviews. (12) Clayton Fowler, Ruby's attorney, did not want Assistant District Attorney William Alexander to hear Ruby's answers and insisted that Ruby not answer questions until the actual tests had begun and Alexander had left the examination room. (13) In some instances, however, Ruby did answer the questions during the pretest stage. Special Agent Herndon had indicated that he preferred to have Ruby answer the questions during the pretest interview, as this was a generally accepted polygraph procedure. (14)

(16) The polygraph examination lasted from 2:23 p.m. to about 9 p.m. (15) Ruby was asked a total of 101 questions, broken into 13 series. A pretest interview was conducted before each question series, at which time the questions were explained to Ruby. They were often rephrased for the actual tests.

(17) The following are the relevant questions and answers from all 13 test groups comprising the Ruby polygraph examination:

  Question. Did you know Oswald before November 22, 1963?  
  Answer. No. (16)
  Question. Did you assist Oswald in the assassination?  
  Answer. No. (17)
  Question. Are you now a member of the Communist Party?  
  Answer. No. (18)
  Question. Have you ever been a member of the Communist Party?  
  Answer. No. (19)
  Question. Are you now a member of any group that advocates the violent overthrow of the U.S. Government?  
  Answer. No. (20)
  Question. Have you ever been a member of any group that advocates violent overthrow of the U.S. Government?  
  Answer. No. (21)
  Question. Between the assassination and the shooting, did anybody you know tell you they knew Oswald?  
  Answer. No. (22)
  Question. Aside from anything you said to George Senator on Sunday morning, did you ever tell anyone else that you intended to shoot Oswald?  
  Answer. No. (23)
  Question. Did you shoot Oswald in order to silence him?
Question. Did you first decide to shoot Oswald on Friday night?
Answer. No. (24)

Question. Did you first decide to shoot Oswald on Saturday morning?
Answer. No. (25)

Question. Did you first decide to shoot Oswald on Saturday night?
Answer. Yes. (27)

Question. Did you first decide to shoot Oswald on Sunday morning?
Answer. Yes. (28)

Question. Were you on the sidewalk at the time Lieutenant Pierce's car stopped on the ramp exit?
Answer. Yes. (29)

Question. Did you enter the jail by walking through an alleyway?
Answer. No. (30)

Question. Did you walk past the guard at the time Lieutenant Pierce's ear was parked on the ramp exit.
Answer. Yes. (31)

Question. Did you talk with any Dallas police officers on Sunday, November 24, prior to the shooting.
Answer. No. (32)

Question. Did you see the armored car before it entered the basement?
Answer. No. (33)

Question. Did you enter the police department through the door at the rear of the east side of the jail?
Answer. No. (34)

Question. After talking to Little Lynn, did you hear any announcement that Oswald was about to be moved.
Answer. No. (35)

Question. Before you left your apartment Sunday morning, did anyone tell you the armored car was on the way to the police department?
Answer. No. (36)

Question. Did you get a Wall Street Journal at the Southwestern Drug Store during the week before the assassination?
Answer. No. (37)

Question. Do you have any knowledge of a Wall Street Journal addressed to Mr. J.E. Bradshaw
Answer. No. (38)

Question. To your knowledge, did any of your friends or did you telephone the FBI in Dallas between 2 or 3 a.m. Sunday morning?
Answer. No. (39)

Question. Did you or any of your friends to your knowledge telephone the sheriff's office between 2 or 3 a.m. Sunday morning?
Answer. No. (40)

Question. Did you go to the Dallas police station at any time on Friday, November 22, 1963, before you went to the synagogue?
Answer. No. (41)

Question. Did you go to synagogue that Friday night.
Answer. Yes. (42)
Question. Did you see Oswald in the Dallas jail on Friday night?
Answer. Yes. (43)

Question. Did you have a gun with you when you went to the Friday midnight press conference at the jail.
Answer. No. (44)

Question. Is everything you told the Warren Commission the entire truth?
Answer. Yes.

Question. Have you ever knowingly attended any meetings of the Communist Party or any other group that advocates violent overthrow of the Government?
Answer. No.

Question. Is any member of your immediate family or any close friend, a member of the Communist Party?
Answer. No. (47)

Question. Is any member of your immediate family or any close friend a member of any group that advocates the violent overthrow of the Government?
Answer. No. (48)

Question. Did any close friend or any member of your immediate family ever attend a meeting of the Communist Party?
Answer. No.

Question. Did any close friend or any member of your immediate family ever attend a meeting of any group that advocates the violent overthrow of the Government?
Answer. No. (50)

Question. Did you ever meet Oswald at your post office box?
Answer. No. (51)

Question. Did you use your post office mailbox to do any business with Mexico or Cuba?
Answer. No. (52)

Question. Did you do business with Castro-Cuba?
Answer. No. (53)

Question. Was your trip to Cuba solely for pleasure?
Answer. Yes. (54)

Question. Have you now told us the truth concerning why you carried $2,200 in cash on you?
Answer. Yes.

Question. Did any foreign influence cause you to shoot Oswald?
Answer. No.

Question. Did you shoot Oswald because of any influence of the underworld?
Answer. No. (57)

Question. Did you shoot Oswald because of a labor union influence?
Answer. No. (58)

Question. Did any long-distance telephone calls which you made before the assassination of the President have anything to do with the assassination?
Answer. No.

Question. Did any of your long-distance telephone calls concern the shooting of Oswald?
Answer. No.
Question. Did you shoot Oswald in order to save Mrs. Kennedy the ordeal of a trial?
   Answer. Yes. (61)
Question. Did you know the Tippit that was killed?
   Answer. No. (62)
Question. Did you tell the truth about relaying the message to Ray Brantley to get McWillie a few guns?
   Answer. Yes. (63)
   Question. Did you go to the assembly room on Friday night to get the telephone number of KLIF?
   Answer. Yes. (64)
   Question. Did you ever meet with Oswald and Officer Tippit at your club?
   Answer. No. (65)
   Question. Were you at the Parkland Hospital at any time on Friday?
   Answer. No. (66)
   Question. Did you say anything when you shot Oswald other than what you've testified about?
   Answer. No. (67)
   Question. Have members of your family been physically harmed because of what you did?
   Answer. No. (68)
   Question. Do you think members of your family are now in danger because of what you did?
   Answer. [No response.] (69)
   Question. Is Mr. Fowler in danger because he is defending you?
   Answer. [No response.] (70)
   Question. Did "Blackie" Hanson speak to you just before you shot Oswald?
   Answer. No. (71)

Interpretations of the Polygraph Examination

Dr. Beavers' testimony

(18) The testimony of Ruby's psychiatrist, Dr. William Beavers, who was present during the examination, was taken by Specter immediately after the polygraph examination on July 18, 1964. (72) Beavers testified that he had examined Ruby 9 or 10 times and had diagnosed him as a "psychotic depressive." However, Beavers stated that on the day of the examination, the "depressive element" had diminished, (73) and that most of the time Ruby understood the questions and answered with an appreciation of reality. (74) The only questions that seemed to tap Ruby's underlying delusional state related to his opinion about the safety of his defense counsel or his family. (75) Beavers did caution, however, that he was an expert in the area of "interrelationships between mental illness and the polygraph." (76)

Special Agent Herndon's testimony
On July 28, 1964, Special Agent Herndon testified before the Warren Commission regarding his interpretation of the Ruby polygraph. Referring to Beavers' testimony, which Herndon had heard on July 18, 1964, Specter questioned him about the validity of a polygraph examination of a psychotic depressive person as described by Beavers. Herndon responded that an examination of person would be inconclusive or invalid in view of the fact that a psychotic individual is divorced from reality, and the tracings of his polygrams could not be logically interpreted.

Specter then questioned Herndon about his interpretation of the polygraph examination based on the hypothesis that Ruby was in fact in touch with reality during the examination and understood the nature of the questions and the quality of his answers. Herndon testified that, assuming Ruby was mentally competent, and interpret the charts as indicating that there was no deception in Ruby's responses to the relevant questions in the examination, that Ruby answered all relevant questions truthfully. During later testimony, when Herndon was questioned about specific questions, he again was careful to qualify his interpretation with the assumption that Ruby was of sound mind. Herndon made it clear that he would find the results inconclusive and the examination invalid in the event Ruby was not of sound mind.

Herndon did mention four factors that he believed should be considered in the overall evaluation of Ruby's polygraph examination. The factors involved the prior extensive interrogation of Ruby, the time elapsed since Ruby shot Oswald, the number of persons present during the polygraph examination, and the number of relevant test questions asked. Herndon stated:

Mr. SPECTER. Do you have anything to add which you think would be helpful to the President's Commission?

Mr. HERNDON. Yes. I would like to make a few additional comments with regard to this polygraph examination, in view of the fact that it was somewhat unique and unusual. I think these factors should be somewhat considered in the overall evaluation of the polygraph examination.

First of all, Ruby has obviously been extensively interviewed by law enforcement officers and by the Commission and other people, and there has been a considerable length of time lapse since the time that the instant offense occurred of him shooting Oswald. These factors of length of time and considerable previous interrogation would tend to detract or negate any specific or definite conclusion that could be rendered with regard to the polygraph examination.

The fact that there were other personnel in the room would tend to negate a valid polygraph technique. However, here again I did mention that this did not appear to bother Mr. Ruby. But it should be considered and made a matter of record. One other point I would like to mention, and that is the large number of relevant questions asked Mr. Ruby during this particular examination. This is not general standard procedure. However, I realize that the President's Commission wanted to cover many facets, and that it was mutually agreed upon that we would ask the questions that the Commission had originally drawn up for this particular
interrogation. In normal polygraph procedure it is usual to keep the relevant questions down to perhaps several specific critical relevant questions and work strictly on those, and in this particular examination we had a large number of relevant questions to ask.

I think these are all factors that should be considered in the overall evaluation of Mr. Ruby's polygraph examination.

Mr. SPECTER. Thank you very much, Mr. Herndon. (81)

FBI memoranda

(22) Two FBI memoranda address the Bureau's interpretation of Ruby's polygraph. The first, dated July 20, 1964, (82) states that a preliminary review of the charts indicated that Ruby was not deceptive when denying that he knew Oswald or that he was involved in any conspiracy. The memo went on to note that this interpretation did not conflict with any of the FBI's prior investigations. The memo did caution, however, that if in fact Ruby had a "psychotic" personality, the test results should be considered inconclusive and not be relied on. The second memorandum, dated July 22, 1964, (83) repeated the same conclusion.

The Warren Commission's conclusion

(23) The Warren Commission stated in its report that it did not rely on the results of the Ruby polygraph examination in reaching its conclusions. (84) The commission noted that it had merely granted Ruby's request for such an examination. It published the transcript of the examination, as well as the transcript of the deposition of the FB polygraph expert who administered the test.

Selection of the panel

(24) In August 1977, the committee decided to convene a panel of experts with no prior affiliation with the Kennedy (or the King) case to review the polygraph examination. Recommendations for panel membership were invited from Walter F. Atwood, executive director of the American Polygraph Association in 1976, and Charles R. Jones, vice president of the American Polygraph Association in 1978.

(25) They suggested nine people who were asked to provide resumes; additional information was sought later. Each was also asked to provide a list of the leading polygraphists.

(26) The committee interviewed 19 prospective panel members and chose 3:

(27) Richard O. Arther--B.S. with honors, in police science, Michigan State
University, 1951; M.A. in psychology, Columbia University, 1960. Arther has been in private practice in New York City since 1953. He founded Scientific Lie Detection, Inc., cofounded the National Training Center of Polygraph Science. He has taught at Brooklyn College, Seton Hall University, the John Jay College of Criminal Justice, and the Graduate School of Public Administration of New York University. He has authored over 200 professional articles and two books. Arther is a member of the Academy of Certified Polygraphists and the American Polygraph Association.

(28) Charles R. Jones--B.S. in education (major in social science); completed National Training Center of Polygraph Science in 1959. Jones has been an instructor at the police training school in Charleston, W. Va., and currently teaches at the Zonn Institute of Polygraph, Inc., in Atlanta, Ga. He joined the Lincoln M. Zonn firm in 1961. Jones is a member of the American Polygraph Association and was elected vice president in 1976.

(29) Benjamin Frank Malinowski--retired Army warrant officer, with a career in criminal investigation and polygraph examinations. He has been an instructor at the U.S. Army Military Police School, Fort Gordon, Ga. He attended the National Training Center of Polygraph Science in 1966. From 1967 to 1969 he was an operations officer with the Southern European Criminal Investigations task force. In 1975, he founded the Malinowski Polygraph Service. He is a member of the American Polygraph Association, and a former director of the Georgia Polygraph Association; twice president of the Georgia Polygraph Association; author of numerous articles on polygraph and criminal investigations, and formerly president of the Zonn Institute of Polygraph. He is also a nationally recognized speaker on polygraph and criminal investigations.

Examination procedures

(30) On March 6, 1978, a letter was sent to each panel member informing him of the materials available relating to the Ruby polygraph. They were:

1. The original polygraph charts.
2. A stenographic transcript of the entire examination, including the pretest and posttest interviews.
3. Testimony of Dr. Beavers, given before the Warren Commission, concerning Ruby's medical condition at the time of the examination.
4. Testimony of FBI Special Agent Herndon, the FBI polygraph examiner, before the Warren Commission.
5. Expert medical testimony given at Ruby's trial. (31) Each panel member was asked to review the list and inform the committee if they required all items or additional material. Each responded that the first four items were necessary and that the medical testimony at Ruby's trial would not be required. On May 19, 1978, copies of the materials other than the medical trial testimony were sent to each expert.
The procedures were that: (1) Each polygraphist would conduct an independent examination of the materials (2) the panel would then meet to discuss each member's findings; (3) a final joint panel report would be prepared and submitted to the select committee.

(33) The experts were asked to focus on the following major areas:

1. The circumstances surrounding the administration of the examination.
2. Any problems created by the medical condition, age, mental stability, et cetera, of the subject.
3. The procedure/technique used by the expert in administering the examination.
4. The analysis of the charts.

(34) The experts were told, however, that they should not feel confined by the above areas and should comment on any factor they considered relevant.

(35) On June 22, 1978, the three panelists and two committee staff members met at the Algonquin Hotel in New York City. The National Archives agreed to have the original charts taken to this meeting. At this time the experts reviewed the original charts and discussed the polygraph examination. The panel was unanimous in its evaluation and agreed that, Arthur would be responsible for writing the panel's Ruby report, subject, of course, to the review and approval of the other two panel members. (85)

(36) The panel conducted its review using the state of polygraph technology in 1964. However, since the panel's review involved basic polygraph principles, the comments and conclusions are still timely.

REPORT OF THE POLYGRAPH PANEL

Crucial factors affecting the examination

(37) The panel noted the four factors mentioned by Herndon as having a detrimental effect on the examination: The time elapsed since the shooting.; Ruby's extensive prior interrogation; the many people present during the examination; and the great number of relevant questions asked. (86)

(38) The panel believed these factors had a serious negative impact on the validity and reliability of the polygraph examination. Because Ruby had been extensively interrogated previously, Herndon should have been sure that the polygraph examination was very carefully conducted.

(39) When first approached by the Commission, Herndon immediately should have explained the polygraph's limitations. He should have refused to compromise the validity and reliability of the polygraph procedure by letting it become yet another
interrogation of Ruby.

(40) Herndon himself considered the procedure to be more an interrogation than a polygraph examination, as seen in his testimony before the Commission with regard to test series 9:

   Mr. HERNDON. Yes, there was at this point in the interrogation. Realizing the Commission had a large number of questions they wanted to ask, it was decided at this point, in view of the fact that we had asked the main critical questions, to proceed with what I call direct interrogation, that is that each and every one of the questions asked is a relevant question, and that there are no irrelevant questions or control questions asked. (87)

And again, discussing test series 9A, he testified:

   Mr. HERNDON. This was done in order to save time inasmuch as the interrogation was becoming rather lengthy at this point, and Mr. Specter indicated he was anxious to proceed and to complete the rest of the questions that we had agreed upon with all those parties that were interested in this interrogation. (88)

(41) Note that in the above quotes Herndon uses the term "interrogation" four times, but not once does he use the term "polygraph examination." If the events of July 18 were considered an interrogation rather than a polygraph examination, the panel would be far less concerned with what it felt were gross abuses of basic polygraph principles. However, since Herndon rendered his opinions as a "polygraph examine" the panel evaluated Ruby's charts as a polygraph examination.

(42) The panel was also very concerned about the number and movement of people in the examination room. During the pretest interviews, as many as 10 persons were present. Two left for the testing phase, returning for the next pretest interview. Since there was a series of 13 pretests and then tests, such comings and goings certainly must have caused distractions.

(43) Herndon himself testified:

   Mr. HERNDON. Normally during a polygraph examination the only ones in the room are the examinee and the examiner, and during Bureau proceedings we usually have another agent in the room out of sight that takes notes. It is considered an undesirable factor to have many people present in the room during a polygraph examination, particularly if these people are involved in any way in the case, such as the defendant's attorney or someone who has a personal and keen knowledge in the proceedings. In this particular instance, it appeared to me that Mr. Ruby divorced the presence of these people from his mind during his response to the questions. However, it should be considered a factor which is one that could tend to negate a valid conclusion with regard to chart
interpretation. (89)

(44) The panel believes the presence of eight persons in the examination room seriously impaired the examination. Any momentary distraction during the examination could cause the examinee to react, thereby recording a "lie" reaction on the polygraph chart. Herndon could well think this reaction was a true reaction to a lie, especially when reviewing the charts at a later time. Further, the panel found that Herndon never repeated a relevant question. The possibility of uncorroborated reactions which are false becomes very crucial in the evaluation of the Ruby polygraph examination.

(45) Herndon should have insisted, long before the date of the examination, that the standard procedure be followed whereby only the polygraphist and the person are in the room. If others had a need to observe the examination, then a room with a one-way mirror, a sound system, and perhaps a recording device could have been used—all standard procedures since the 1930's. A recorder might also have eliminated the need for the presence of a reporter in the examination room. A recorder generally provides a more accurate record. The Dallas Police Department had available a specially prepared and equipped room which would have allowed for a much more professional and conducive atmosphere. (90)

(46) A third factor the panel finds impaired the Ruby polygraph examination concerned the number of relevant test questions asked. The panel members believe it showed total disregard of basic polygraph principles.

(47) The crux of every polygraph examination is the number of test questions and how they are worded. When the Ruby examination was conducted, the primary textbook on the subject was "Lie Detection and Criminal Interrogation," by Fred E. Inbau and John E. Reid (3d ed., 1953). This book recommends three relevant questions, since the more a person is tested, the less he tends to react when lying. That is, sooner or later, liars become so "test-tired," they no longer produce significant physiological reactions when lying. One panel member, Arther, said that in his 27 years of experience he had never heard of polygraph examination with more than 17 relevant questions. Yet, in the Ruby examination, Herndon asks some 55 relevant questions. As Herndon himself stated:

In normal polygraph procedure it is usual to keep the relevant questions down to perhaps several specific critical relevant questions and work strictly on those. (91)

(48) Further, the panel could see no need for the vast majority of the relevant questions. It considered most to be trivial in comparison with the major issues on which Herndon should have concentrated. For example, the following trivial and poorly worded relevant questions were asked:

1. Did you get a Wall Street Journal at the Southwestern Drug Store during the week before the assassination?
2. Did you go to the Dallas police station at any time on Friday, November 22,
1963, before you went to the synagogue?

3. Did any close friend or any member of your immediate family ever attend a meeting of any group that advocates the violent overthrow of the Government? (92)

(49) The panel concludes that Herndon should have insisted that the total number of issues covered be reduced to no more than before. The panel suggested, for example, that only the following four relevant test questions should have been asked to cover the critical issues (Herndon did ask questions similar to three of the areas):

Before last November 22, did you ever hear the name of Lee Harvey Oswald?
Did you murder Oswald to silence him?
Did anyone instruct you to murder Oswald?
Did you ever talk with Lee Harvey Oswald? (93)

Loss of control

(50) Numerous instances in the transcript of the Ruby polygraph examination indicate that Herndon completely lost control over the examination. The problem most often stemmed from the ad hoc participation of the observers in the conduct of the polygraph examination. (Of course the panel found the number of observers itself to be detrimental to the examination.)

(51) As an example the standard pretest procedure is to ask the person each question and allow for discussion and a response. This is done before any of the components are attached to the examinee. Herndon stated his intention to proceed in this manner, but upon objection from Ruby's attorney, Clayton Fowler, Herndon acquiesced, abandoning this most important aspect of the pretesting phase and disregarding an important polygraph principle. The applicable part of the transcript follows:

Mr. HERNDON. In other words, I am going to tell you what the question is going to be and you shall feel free to answer it "yes" or----

Mr. FOWLER. Excuse me, sir.

Mr. HERNDON. Certainly.

Mr. FOWLER. At this time, Jack, I request that in view of the fact that you're not hooked up, that you do not answer the question and reserve those until such time as you will be on the machine.

Mr. RUBY. That's fine.

Mr. HERNDON. Then, we will just discuss the questions.

Mr. RUBY. Do it to your advantage, may I add.

Mr. HERNDON. I generally prefer in my practice with the polygraph to have the gentleman answer the question so that he knows he has already answered it, and as a matter of record, he knows that that question is coming along.

Mr. RUBY. Please let me do it, will you? [Addressing Mr. Fowler.]

Mr. FOWLER. [No response.]

Mr. HERNDON. I will bow to whatever Mr. Specter or counsel wants to do in this regard.
Mr. RUBY. Fowler, I hate to dispute with you, but let me do it this way?

Mr. FOWLER. Well, Jack, again, Mr. Alexander is here and again I tell you this--that the answers to some of these questions could be absolutely very detrimental to you.

Mr. RUBY. They can't.

Mr. FOWLER. I'm talking about from a legal standpoint. Now, morally, I know how you feel and you want to do the best you can for the commission.

Mr. RUBY. I will.

Mr. FOWLER. But by the same token, this gentleman over here [referring to Mr. Alex Ruder] represents the State, who at this time is not representing you. Now, if we could allow Mr. Alexander to have the benefit of the nature of the questions, with the exception of the answers--if this it what Jack wants--but I do not want Mr. Alexander to have the benefit of the answers.

Mr. SPECTER. The test may be conducted either way. As Mr. Herndon has explained, he has a slight preference to have the answers, but the ultimate decision on that is up to Mr. Ruby and his counsel. The commission will proceed in either manner.

Mr. RUBY. It's unfortunate that my attorney, Mr. Fowler, don't see as I do. I would like to give every cooperation without the slightest fraction of interference. That's why I requested that. You won't let me do it that way, huh, Fowler?

Mr. FOWLER. I'm requesting that you do not, Jack.

Mr. HERNDON. It will be no problem. (94)

(52) Other examples of Herndon's loss of control abound. For example, on one page of the transcript, he makes only two short statements; (95) at another point, a discussion by the observers about one question occupies almost six pages and includes an argument between Ruby and his attorney, Fowler, about who should be present in the room. (96) At other points, Ruby is reminded by Fowler that he could be convicted of first-degree murder by telling the truth and that he should not even be taking the polygraph examination. And at still another point, Herndon seeks the advice of Warren Commission attorney Specter about the phrasing of a question. (97)

(53) A good example of an objectionable result that occurred because of Herndon's loss of control takes place as follows. Just before test series No. 4, Ruby's responses were very erratic. He appeared to have "gone to pieces." Herndon later attributed this to fatigue, citing this as "the first series where Mr. Ruby tends to show a little fatigue." (98)

(54) However, just before that series had started, Ruby had had a private conversation from 4:13 to 4:15 with another of his attorneys, (99) whom Ruby previously had not wanted in the examination room, as shown by this:

Mr. RUBY. Did you get your pants sewed up, Joe?

Mr. TONAHILL. It went through to my leg.

Mr. RUBY. That was a pretty rough brawl we had, wasn't it, Joe?

Mr. TONAHILL. Yes.

Mr. RUBY. Joe, I'd appreciate it if you weren't in the room. Can I ask you to
leave, Joe?
Mr. TONAHILL. I'll be glad to leave, if you want me to, Jack.

Mr. RUBY. As a matter of fact, I prefer Bill Alexander to you, you're supposed to be my friend.
Mr. TONAHILL. Let the record show that Mr. Ruby says he prefers Bill Alexander being here during this investigation, who is the assistant district attorney who asked that a jury give him the death sentence, to myself, who asked the jury to acquit him, his attorney. (100)

(55) Ruby then had two off-the-record conversations with Alexander—from 4:15 to 4:18 and from 4:22 to 4:25, (101) followed by still another extremely long argument as to the wording of just one test question, with five people taking part in the discussion: (102) "Were you in the Dallas Police Department jail at the time Lieutenant Pierce's car drove out of the basement?" (103)

(56) The panel questioned Herndon's conclusion that it really was fatigue that caused Ruby to "go to pieces" on this particular test, believing it might have been due either to something said during the three private conversations or to the argument over the wording of that one question. Perhaps it simply was the chaotic nature of the entire situation.

(57) The panel believed that the participation of the observers and the various asides never should have been allowed by Herndon. The panel concluded that Ruby was probably distracted, both mentally and physically, making a difficult examination even more difficult to conduct successfully.

Other factors

(58) In addition to the factors discussed above which impaired the Ruby polygraph examination, the panel concluded that 10 additional factors, of perhaps less importance, further reduced the validity and reliability of the examination. These are as follows:

(59) 1. It is generally agreed that, the best time to examine is in the morning, because then the great majority of persons are both physically and mentally "fresh." As the day progresses, a person normally tires. Since the polygraph mainly records physical change induced by mental stimulation, a tired person does not react to stimulation as well as a rested person does. Although Ruby most likely was a night-oriented person as a result of his occupation as a nightclub owner, by July 18, 1964, normal prison routine no doubt had changed his orientation. The panel therefore concluded that the examination should have started early in the day, perhaps around 8 a.m. As it was, the examination started at 2:23 p.m., with the first test beginning at 3:10 p.m. (104)

(60) 2. When administering an extremely difficult examination, most experts advocate reexamination on a later date to check the reliability of the first examination, that is, will the same reactions be obtained on the reexamination? Ruby was never given a second polygraph examination, nor is there any indication that
one was ever considered. After reviewing the charts, each panel member believed
strongly that a reexamination was absolutely essential for at least three reasons:

(61) a. It is a basic and commonly accepted polygraph procedure.

(62) b. Herndon did not repeat relevant questions, thereby providing no possible
corroborating the results.

(63) c. All of the adverse factors working against the orderly conduct of the
examination made the results of the examination suspect, at best.

(64) 3. The panel concluded that the polygraph instrument was either improperly
adjusted, or defective, or both. It made three tracings, two of which are so totally
inadequate that they appear to be defective. The breathing tracing is particularly
poor, either because the sensitivity was maladjusted or possibly because the
pneumograph tube was not properly placed on Ruby. The amplitude of the breathing
tracing is not even minimally acceptable in any of the 13 tests. The panel found this
to be a constant handicap in analyzing this extremely important tracing and
interpreting the charts. Sufficient amplitude is critical because the polygraphist looks
for changes in the breathing pattern. Often such changes are minute and simply do
not appear when the amplitude is small to begin with.

(65) The panel found the galvanic skin response (GSR) tracing to be of minimal help
in analyzing Ruby's charts. The main problem with the GSR in the first session
(before the break) is a lack of sensitivity due to Herndon's setting the sensitivity at
one-fourth of maximum. He decreased it to one-fifth for the third series of questions.
The panel noted that it should have been tried at a maximum sensitivity prior to the
first test, where probably it should have remained for the entire examination. Had the
sensitivity been higher, the polygraph probably would have produced an
adequate
tracing, that is, one that the panel could analyze.

(66) The panel could provide no explanation for why Herndon decreased the
sensitivity for the third series. In fact, generally recognized principles in 1964 called
for the sensitivity to be continually increased.

(67) After the break, the examination commenced with series 5 through 11, with the
sensitivity set at one-fifth of maximum.

(68) The panel concluded that during this entire session, the GSR was completely
defective. At best the polygraph appeared to be in extremely poor condition. In an
examination of this importance, a backup polygraph should have been available and
in the panel's view, should have been used. The examination should have been
stopped until another polygraph could be obtained.

(69) 4. Herndon's definition of a "control" question goes far beyond the generally
recognized definition, as discussed in the leading book of the day by Inbau and Reid.
The "control" question, developed by Reid in 1943, is one similar but unrelated to
the crime being investigated to which the expert knows the correct answer and to
which the person will probably lie. If the person's reaction to a properly worded control is more pronounced than to the relevant questions, he is considered to be truthful. On the other hand, if his reaction to the relevant questions is more pronounced, he is considered to be lying to the relevant questions.

(70) If the control questions are properly worded, it is very possible that a person lying to the relevant questions will appear to be truthful.

(71) Herndon's control questions were not correctly worded. He defined a "control" question as one to which the person will have some emotional response. (105) Thus, he used such controls as:

1. Have you ever been arrested? (106)
2. Are you married? (107)
3. While in the service did you receive any disciplinary action? (108)
4. Have you served time in jail? (109)
5. Did you attend the synagogue regularly? (110)

(72) It is obvious that not one of the above questions is a control, as defined by Inbau and Reid. For example, to the question, "have you ever been arrested?", Ruby answered "yes." Therefore, it is not a lie, yet Herndon considered it to be a control question. (111)

(73) Further, Herndon violated a basic rule that surprise questions should never be used as controls. For example, while asking a series, he says, during the test, "have you ever been known by another name? Don't answer that question. Skip it. Just sit and relax." (112)

(74) Such talk by the expert should automatically prevent this question from being used in the chart analysis, yet Herndon uses it as a control. He testified: "The only significant change physiologically during series No. 2 was in Mr. Ruby's response to the question, "Have you ever been known by another name?," portrayed by an increase in his blood pressure." (113)

(75) Such a procedure can easily lead to a mistake, particularly in indicating a liar to be truthful. In fact, if one wants to generate a truthful response on the cart when testing a liar, one could ask a surprise question, then immediately give extensive instruction regarding it, and thereafter evaluate it as a control question. In such a situation, at least 95 percent of the liars will give a more intense physiological reaction than they will to the relevant question to which they are lying.

(76) 5. What Herndon considers to be irrelevant questions often do not meet the criteria for an irrelevant question. The generally accepted definition of an irrelevant question is a meaningless, nonemotional question which the polygraphist knows the person will answer truthfully, e.g., "Do you live in the United States", or "Right now are you in Texas?"

(77) It was difficult for the panel to determine if Herndon considered certain
questions to be irrelevants or controls. In fact, he himself confused their distinction. For example, question 4 in series 3 is officially listed as an irrelevant ("Are you married?"), yet Herndon used it as one of his control questions. (114)

(78) Following are several examples of irrelevant questions, as indicated on Herndon's question sheets, which the panel concluded were improperly classified. The panel found these questions to be more relevant, at times, to the important issues than the questions Herndon had listed as relevant.

1. Is your last name Ruby? (Originally his name was Rubenstein, and Herndon asked this question even after being told that Ruby changed his name from Rubenstein.) (115)
2. Did you take any medication this morning?
3. Have you answered these questions truthfully?
4. Are your parents alive? (Both are dead, and after his father died Ruby went to the synagogue "consistently for 11 months, morning and evening.") (116)
5. Are you tired?
6. Do you intend to answer the questions truthfully?
7. Were you at one time employed by a union? (There was also a relevant question, "Did you shoot Oswald because of labor union influence?") (117)
8. Is everything you told the Warren Commission the entire truth?

(79) 6. It is customary to repeat every question at least on a second test. This is done in order to establish the consistency (reliability) the polygraph reactions. This was not done in the Ruby examination. Therefore, there was no way for Herndon to establish the reliability of the relevant questions.

(80) Hence, the possibility that a "lie reaction" to a control was caused by something other than a lie remains an open issue. This is particularly important because there were so many possible distractions in the examination room.

(81) 7. Between tests, a polygraphist should not tell a person if the tracings indicate truthful or lying responses to the relevant questions. This is particularly important in case a liar has some method of "beating the lie detector." If he believes he is coming across as truthful, he is reassured that his method is working. Thus, he will feel less uneasy when he lies, producing less dramatic reactions.

(82) In spite of this, after completing the first series, Herndon told Ruby: "Mr. Ruby, there are two questions I want to ask you about on our first series." At this point he discussed only the questions having to do with Ruby's middle name and the question having to do with whether Ruby had ever been arrested. Herndon did not mention the relevant questions, which could easily have led Ruby to believe that he had "passed" the test in regard to the relevant questions. (118)

(83) Herndon finished the discussion of series 1 with the comment: "Mr. Ruby, you are now a veteran of the first series. You did real well. You cooperated very fine." (119)
(84) Such statements could easily be interpreted by Ruby as meaning that he seemed to be truthful (to the relevant questions), especially when Herndon stated, "You did real well."

(85) If Ruby had lied on the first test, he would have had good reason to believe he had beaten the polygraph. Such knowledge certainly would have reduced his fear of lying, hence his lying reactions would have been reduced in subsequent questioning.

(86) And again, just as the first series is ending (prior to the break at 4:45 after series 4, Herndon stated: "You've done very well thus far, Mr. Ruby, as far as cooperating on the examination." (120)

(87) 8. A great deal of thought and preparation is necessary to conduct a quality polygraph examination. When a case is complicated or the examination conditions adverse, more preexamination preparation is necessary.

(88) In the panel's opinion, Herndon appeared largely unprepared to conduct the Ruby examination. Herndon testified that he knew the issues the Warren Commission wanted covered. (121) However, it appeared that all questions were not prepared in written form before the day of the examination. For example, as the first phase of the examination was being completed, Herndon said: "We will have to prepare some more questions." Specter: "May the record show that Mr. Alexander and Mr. Tonahill are now back in the room, and we are going to take a brief recess." (122) The "brief recess" lasted 1 hour and 40 minutes, during which time Ruby apparently was left in the examination room. (123)

(89) 9. The panel concluded that Herndon often used techniques in conducting the polygraph examination which did not conform to generally recognized principles of polygraphy. An example is test series 3A, which apparently was a "searching peak-of-tension test." A searching peak-of-tension test usually contains six or seven logical questions on the same issue. The polygraphist does not know which one is actually true. It is hoped that the liar will give a lying reaction to the appropriate question, thus permitting the expert to learn information not previously known. This test is usually given to locate loot and/or weapons, learn the names of accomplices, determine the amount of money embezzled, et cetera.

(90) The panel found the wording of the basic question in this series--("When did you first decide to shoot Oswald?")--to be very poor. This question ignored the possibility that Ruby might have been ordered to murder Oswald. The panel also found other choices to be poor. For example, the possibility that Ruby may have decided to shoot Oswald on the previous Friday night or the next Saturday afternoon were not even asked.

(91) 10. It is generally agreed that the more a person is tested, the less responsive he becomes. If a liar is tested enough times, sooner or later, his reaction to lies will be no more intense than to control and relevant questions, lie therefore will appear truthful when lying. For this reason, the great majority of the recognized polygraph techniques limit the number of test groups to five or less, with no more than two
different series of questions. Most call for the entire examination to be concluded within 2 hours. Panel member Richard Arther, for example, uses just one series of four relevant questions, asked in three separate test groups.

(92) The Ruby examination consisted of 13 groups of questions, with the actual examination starting at 2:23 p.m. (124) and ending at 8:59 p.m. (125) Even though there supposedly was a break of 100 minutes, the testing should never have been resumed that day.

(93) Herndon himself recognized this:

Mr. SPECTER. Is there any overall limitation on the amount of time that a person can appropriately take a polygraph examination?

Mr. HERNDON. Yes; there is a limitation. Certainly if a person is interviewed with polygraph at great length, in due time he is bound to become desensitized to the technique. In other words, the pressure on his arm and the technique itself becomes less valid as the increase in time proceeds.

Mr. SPECTER. Did Mr. Ruby ever become desensitized to the technique?

Mr. HERNDON. I believe in the last series of the first session, which I believe is series 4, Mr. Ruby showed some indications of becoming fatigued and displayed some tiredness in the charts. Also, I might add in the later phase of the examination, in the latter series, there was some indication that he was approaching this desensitization that I have mentioned before. (126)

(94) The panel concluded that the Ruby examination was far too long.

Chart Analysis

(95) The panel concluded that the Ruby polygraph examination was probably invalid and unreliable. As discussed above, the panel found serious flaws in the examination procedures. The questions were especially poorly worded. The polygraph instrument itself was either incorrectly adjusted or defective in its operation. The panel could render no opinion regarding the examination results.

(96) Of the 13 test groups, the first and second are perhaps the most valid in that they were conducted when Ruby was still "fresh?" Because of the importance of the relevant questions in these two tests, the panel has briefly summarized its opinion about them.

(97) The relevant questions on the first series and Ruby's answers were:

1. Did you know Oswald before November 22, 1963?
   Answer. No.
2. Did you assist Oswald in the assassination?
   Answer. No.
(98) Herndon concluded from his analysis of the charts that Ruby was truthful in answering these two relevant questions. He arrived at this conclusion by comparing Ruby's response to the control question (Have you ever been arrested? Answer: Yes.)

(99) As previously noted, the panel believed this to be an extremely poor control question.

(100) Herndon testified that Ruby's physiological response to this control question was recorded on the charts in terms of a "noticeable rise in his blood pressure." Further, the panel took issue with this conclusion because the rise in blood pressure occurred at least 7 seconds after Ruby answered. A response normally never occurs this long after the question. The typical reaction, would be in 1 or 2 seconds. Further, the panel noted that at the point of the rise in blood pressure, Herndon indicated on the chart (as "MF") that Ruby moved his feet. The panel believed that the rise in blood pressure most likely was caused by Ruby's movement and not his physiological reaction to the "control" question. This conclusion is corroborated by the fact that Ruby's breathing remained relaxed at the time of the rise in blood pressure, and the Galvanic skin response showed no reaction.

(101) In fact, the reactions to the preceding question--(Did you assist Oswald in the assassination?)--showed the largest valid GSR reaction in test series No. 1. In addition, there is a constant suppression of breathing and a rise in blood pressure at the time of this crucial relevant question. From this test, it appeared to the panel that Ruby was possibly lying when answering "no" to the question, "Did you assist Oswald in the assassination?" This is contrary to Herndon's opinion that Ruby was truthful when answering that question.

(102) The relevant questions on the second series and Ruby's answers were:

1. Are you now a member of the Communist Party?
   Answer. No.
2. Have you ever been a member of the Communist Party?
   Answer. No.

(103) Herndon concluded that Ruby was truthful when answering these two questions. He testified that the only significant physiological change noted occurred in response to the question, "Have you ever been known by another name?" The response identified by Herndon was a rise in blood pressure. (128) However, Herndon stated that Ruby later said he was confused on how to answer the question because he had changed his name from Jack Rubenstein years before. Herndon testified that other variations in the breathing tracing were caused by Ruby's hesitating to answer some questions due to their length. (129)

(104) The panel noted that according to the transcript of the examination, Ruby did not answer the question about his having another name. Herndon told him not to answer because they had not reviewed it during the pretesting phase. (130) The panel concluded that Ruby's reaction was simply a false reaction to Herndon's unorthodox
instruction after he asked the question. On the other hand, the panel noted large rise
in blood pressure in response to the question, "Have you ever been a member of the
Communist Party?", to which Ruby answered, "no."

(105) This question also evoked by far the most dramatic breathing reaction.
Although Herndon claimed that the only variation in breathing in this series is
cased by the length of the questions, this was certainly a short question, and it is
much more likely he was referring to the other questions.(131)

(106) In fact, in regard to the question, Are you Communist Party?" Herndon stated,
"there was no significant physiological change."(132) However, Herndon himself
apparently wrote on the chart on this question, "slight suppression," which indicates
a specific emotional change and one which is an excellent indicator of lying.

(107) It is interesting to note that, during the entire first testing session this is the
only place where Herndon wrote on the chart anything having to do with the
breathing, except on series 4, when he wrote as general comment, "Breathing
irregular."

(108) In summary, the panel strongly disagreed with Herndon's opinions, and
specifically with series 1 and 2, as discussed above. The panel concluded that the
"lie" reactions on these two tests occurred on questions different from those
suggested by Herndon. Based on its analysis of the charts themselves, and not
considering the negative factors affecting the veracity of the examination, the panel
could not form an opinion that Ruby told the truth when answering "No" to the four
relevant questions asked on test series 1 and 2. On the contrary, the panel found
more indication that Ruby was lying in response to these four questions.

(109) It is emphasized by the panel, however, that no opinion could be rendered on
the validity of this examination or the reliability of the results for the numerous
reasons discussed in this report.

Source http://www.jfk-online.com/rubyhscapoly.html
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(2) Procedural rules of the House Select Committee on Assassinations, rule 7.2 (a).

(3) From the curriculum of the U.S. Army Provost Marshal General Polygraph School, Fort McClellan, Ga.


(6) Ibid.


(11) Id. at 511.

(12) Id. at 514.

(13) Id. at 514.

(14) Id. at 518.

(15) Id. at 511, 569.

(16) Id. at 523.

(17) Ibid.

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(78) Id. at 582.
(79) Id. at 586.
(80) Id. at 587.
(81) Ibid.
(82) FBI memorandum, to Conrad from Jones, July 20, 1964, File No.44-24016-1807.
(83) FBI memorandum, to Conrad from Jones, July 22, 1964, file No.44-24016-1827.
(87) Id. at 595.
(88) Id.
(89) Id. at 583.
(90) In July 1964, Paul Bentley was the chief polygraphist, Dallas Police Department. During the summer of 1978, Bentley confirmed to panel member Arther that his properly equipped room would have been made available had anyone requested it for Ruby's examination.
(91) Warren Report at 598.
(92) Id. at 551-556.
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(113) Id. at 588.
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(115) Id. at 526, 534.
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