A POSITION PAPER ON THE USE OF DIRECTED LIE COMPARISON QUESTIONS IN DIAGNOSTIC AND SCREENING POLYGRAPHS

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There has been some question as to when it is valid or permissible to use directed lie comparison (DLC) questions. More specifically, this question and this related discussion pertain to whether it is scientifically valid to use DLCs in diagnostic and/or screening test formats. Discussion of these questions extend quickly into the realm of professional ethics, which centers around ensuring that we, as professionals, make good choices that benefit our profession, our agencies, our communities, our country, and the individual being tested. Ethics is, after all, a discussion about right and wrong with consideration for what bad or good things happen to whom as a result a particular choice of action or activity. The polygraph profession sits at a crucial point of ethical discussion, pertaining both to theories of truth and deception, and to the competition of rights, priorities and impacts between individual persons and communities or groups of people. It is a goal of science to provide evidence-based models for making decisions and policies for which we can calculate the expected results with mathematical precision, and therefore manage the impact that decisions and actions have on individuals and groups. It is our position that answers to questions about scientific validity and ethics should be informed and determined by data and evidence, and not by a declarative system of arbitrary rules without evidence (or negligent of the evidence).

Compliance with policies and regulations is important, and this paper is not intended to supersede the existing policies or mandated field practices of any agency. Rather, this document is intended to orient the reader to the scientific evidence regarding the DLCs, and to anchor a more informed professional discussion regarding matters of scientific validity and polygraph field practices. Administrators, policy makers, as well as examiners place themselves in an untenable position when their decisions and policies are not grounded in science. That position is one of having to explain or defend one's policies or field practices when they are inconsistent with the published scientific evidence that is available to any opposing counsel. The same evidence that could be used to improve the effectiveness and validity of the polygraph could also be used to undermine the credibility and viability of the profession if we chose to ignore it. It is hoped that this document will lead to further discussion and improvements in policies and field practices that may be outdated or negligent of the scientific evidence regarding the use of DLCs.

Summary of the Research

The following studies incorporate the use of DLCs in a variety of settings, including multi-issue and single-issue screening and diagnostic testing in both laboratory and field studies.

Barland, G. H. (1981). *A Validity and Reliability Study of Counterintelligence Screening Test*. Fort George G. Meade, Maryland: Security Support Battalion, 902d Military Intelligence Group.
Conclusions: This study, which included 56 military subjects, evaluated the effectiveness of DLCs in mock screening tests where participants were tested on multiple issues. This study highlighted the effectiveness of DLCs in identifying truthful and deceptive subjects, and differentiating truthful from deceptive subjects at rates that exceeded chance at statistically significant levels.

Department of Defense Polygraph Institute Research Staff (1995|1997). *Report DODPI94-R-0008: A comparison of psychophysiological detection of deception accuracy rates obtained using the Counterintelligence Scope Polygraph and the Test for Espionage and Sabotage question formats.* Available from the Defense Technical Information Center as report #ADA319333; also reprinted *Polygraph, 26* (1997), pp. 79-106.
Conclusions: This study evaluated the effectiveness of the Test for Espionage and Sabotage (TES) which utilizes DLCs and format upon which the Directed Lie Screening Test (DLST) was based. This study included 277 participants, and noted that the use of DLCs reduced the problems associated with the use of probable lie comparison (PLC) questions. Additionally, this study noted that the TES performed with high accuracy that exceeded that of other polygraph screening techniques.

Department of Defense Polygraph Institute Research Division Staff (1998). Psychophysiological detection of deception accuracy rates obtained using the Test for Espionage and Sabotage (TES). *Polygraph, 27*, 68-73.
Conclusions: This study further evaluated the effectiveness of the TES which utilizes DLCs. This study, which included 85 participants, concluded that the TES performed impressively, with high levels of sensitivity to deception and specificity to truthfulness. No doubt these results, at least in part, led to the federal government's adoption of this technique, which is still in use for screening examinations today.

Honts, C. R., & Raskin, D. C. (1988). A field study of the va-

lidity of the directed-lie control question. *Journal of Police Science and Administration, 16,* 56-61.
Conclusions: The authors of this single-issue field study noted that use of DLCs is far more standardized and straight forward than with the use of PLCs. Results of this study, involving 25 criminal subjects, support the use of DLCs in criminal testing, with an overall decision accuracy level of .92 and an inconclusive rate of .04.

Honts, C. R., & Reavy, R., (2009). *Effects of Comparison Question Type and Between Test Stimulation on the Validity of Comparison Question Test. Final Progress Report on Contract No.W911Nf-07-1-0670*, submitted to the Defense Academy of Credibility Assessment (DACA). Boise State University.
Conclusions: The use of PLCs and DLCs was investigated using the Federal ZCT format. There were no significant differences between the decision accuracy levels of the DLCs and PLCs in this single-issue study involving 250 participants. The use of DLCs was recommended due to their standardized implementation, their ease of teaching and learning, and their perception as less intrusive and less objectionable.

Horowitz, S. W., Kircher, J. C., Honts, C. R., & Raskin, D. C. (1997). The role of comparison questions in physiological detection of deception. *Psychophysiology, 34*, 108-115.
Conclusions: This study, which included 60 participants in a single-issue format, concluded that there were no significant differences between use of DLCs and the use of PLCs. The authors of this study noted that the use of DLCs had far greater face validity, were less problematic and lent themselves to greater standardization than that of PLCs.

Kircher, J. C., Packard, T., Bell, B. G. & Bernhardt, P. C., (2001). *Effects of Prior Demonstrations of Polygraph Accuracy on Outcomes of Probable-Lie and Directed-lie Polygraph Tests.* Final report to the U. S. Department of Defense Polygraph Institute, Ft. Jackson, SC. Salt Lake City: University of Utah, Department of Educational Psychology.
Conclusions: The use of PLCs and DLCs did not show statistically significant differences in a single-issue study involving 336 participants. Furthermore, it was noted in this study that the use of DLCs is more easily standardized, is less intrusive and is less embarrassing to the examinee.

Raskin, D. C. & Kircher, J. C., (1990). *Development of a Computerized Polygraph System and Physiological Measures for Detection of Deception and Countermeasures: A Pilot Study.* Preliminary Report. Salt Lake City: Scientific Assessment Technologies, Inc.
Conclusions: This study, which included 48 participants, studied the effectiveness of DLCs. It concluded that DLCs improved accuracy for both truthful and deceptive subjects. It also noted that this improved accuracy may be due to much greater face validity, higher construct validity, less manipulation of the subject, ease of standardization of question content and explanation to the subject, and more standardized test procedures.

Arguments against the use of the DLC

To this date, arguments against the use of DLCs have not been based in empirical data. Unfortunately, the arguments even frequently contradict the present evidence supporting the effectiveness of the DLCs. One of the most common and basic arguments offered against use of DLCs is that a person, whether a field examiner, program manager, or administrator, was never taught the use of DLCs, or worse – that they were never "officially taught" the use of DLCs during one's initial training. Considering that all professionals in all fields of professional work have an obligation to engage in continuing education and make use of new knowledge, this argument simply embraces negligence. Resistance to or rejection of new scientific findings and additional knowledge is irresponsible, and can only result in a profession that is handicapped by arcane procedures and will fall behind the pace of learning and progress in other fields of science. Attitudes like this, if tolerated or encouraged, fuel accusations that polygraph examiners are not professionals and the polygraph test is not a scientific practice.

Related to this argument would be the similarly rigid and negligent notion that polygraph techniques are fixed in stone and should never evolve with new knowledge or evidence, that polygraph techniques must always be used only in the manner in which they were initially devised. All fields of professional work and scientific study are expected to evolve and incorporate new knowledge and new methods as data reveals the best identifiable practices. Professions that neglect to continue advancing will eventually cease to exist. To reject data and evidence simply because one did not learn about it a five years ago, 10 years ago or 20 years ago, does not mean that the data does not exist, and cannot be accepted as a basis for failing to advance our professional methods. To hold fast to this kind of obvious negligence is to pretend that there is nothing at all that is left to learn – that we presently have all the knowledge that is available or needed. Scientific study is based on the assumption that we do not and cannot know everything, and that we have an obligation to continue learning and improving our methods. Negligence about continued learning and improvement, rigid adherence to old or outdated methods, and refusal to include new knowledge and principles into existing field practices will only ensure the legitimacy of accusations that the polygraph profession is somehow not a legitimate form of science that cannot keep pace with, and therefore has no place with other fields of forensic science.

Other arguments against the use of DLCs are based on an unnecessarily circumspect view of the psychological and physiological bases of response to polygraph stimulus questions. The traditional explanation of "psychological set," though not a psychological construct of its own has provided a needed and plausible explanation for examiners not conversant with the range of psychological theories. The major shortcoming of the "psychological set" explanation is that it was coined at a place and time during which psychological discussions appear to have been limited to discussions of emotion alone. The "psychological set" explanation requires that we make mind-reading assumptions about which emotion (fear) is driving an observed physiological stimulus, along with assumptions about the exact cause of that emotion. Theories about fear and emotion alone cannot account for well-known evidence-based polygraph phenomena such as the accuracy of the polygraph with psychopathic persons and the effectiveness of the DLC. The science of psychology has extended well beyond discussions limited to emotion alone, and includes emphasis on cognition, behavioral conditioning, learning theory, neuro-physiology, measurement and decision theory. The polygraph profession must seek a more complete psychological explanation. More complete theories, that include emotion, cognition, and behavioral theories, have been suggested (Handler & Nelson, 2007; Handler, Shaw & Gougler, 2010; Senter, Weatherspoon, Krapohl & Horvath, 2010), and can better account for the range of known and

observed polygraph phenomena.

To this date the psychophysiological literature has identified no manifest difference in physiological responses to different emotions that can be utilized or measured in polygraph field testing circumstances. The result of this limitation is that the "psychological set" explanation cannot account for the effectiveness of DLCs, and cannot account for the effectiveness of the polygraph with psychopathic persons who are known to experienced low levels of fear, anxiety, and fear conditioning. Faced with a disparity between evidence and explanation or theory, one of them must change. Facts are facts, and the evidence stands for itself. It is the explanation or theory which must continue to evolve to better explain the available evidence. Rejection of evidence in favor of a theory which cannot explain it is simple foolishness.

Salience, a newer term, (Handler & Nelson, 2007; Handler et al.,2010; Senter et al., 2010) provides a more complete explanation of the range of psychological phenomena (i.e., emotion, cognition, and behavioral conditioning) that potentially contribute to observed polygraph responses. There is no reason to believe the absurd notion that one physiological basis of response suddenly switches "off" while another basis of response switches "on" simply because the polygraph examiner selects one type testing technique (e.g., CIT or CQT) or one type of test stimulus over another (e.g., DLC or PLC). It is more likely that a single uniform theory or construct underlies all responses to polygraph stimuli and all observed polygraph phenomena. The challenge to polygraph theorists has been to articulate a parsimonious psychophysiological explanation that accounts for the range of known and observed polygraph phenomena. Salience says only that a stimulus is important for reasons related to either emotion, cognition or behavioral experience. Test results are provided in the form of a professional opinion. Professional opinions should always be based on data and evidence. Categorical decisions about truthfulness or deception are decision theoretic concerns that are addressed through statistical inference and normative data for truthful and deceptive persons.

Another argument against the use of DLCs has been to sidestep all discussion about matters of science and attempt to win the argument through a massive appeal to authority (*"the-big-guys-say-no,"* or *"the-big-guys-do-it-the-other-way"*). This is, of course, the most basic of all logical fallacies. The purpose of discussions and questions of scientific validity is to examine the evidence, not opinions, pertaining to validity. Arguments based on simple appeal to authority are ultimately a form of intellectually waving the white-flag of surrender. It is to accept the notion that it is acceptable to simply imitate and follow the leader rather than investigate, think, and make decisions based on data and evidence. As such, practitioners embracing this line of thought are typically unarmed and unprepared to discuss details relating to scientific validity and scientific evidence because they have already chosen to leave "those sort of things" to others and are content to just do-as-they-do. The detriment of this kind of attitude is that it stagnates the profession, inhibits critical thinking and dampens individual or collective initiative to advance polygraph.

Imagine what would happen if we were to impose on the profession that all civilian law enforcement polygraph programs restrict their polygraph techniques to those methods that are presently taught or approved by the US Department of Defense. This might produce a short term improvement in standardization, but the cost of this short term gain would be a substantial long term reduction of the collective intelligence of the polygraph profession. Police agencies and police examiners would be prohibited from using the polygraph techniques that published scientific studies have shown to be the most accurate. Those scientific studies were conducted by reputable scientists at credible research universities, and were sometimes funded by grants from the US Department of Defense.

Persons who seek to force the polygraph profession into a permanent mindless appeal to authority have no justification for seeking or remaining in position of leadership. They are not equipped to facilitate the development of evidence based policies that will ensure the long term success of the profession. Their intellectual contribution is limited to parroting whatever authority they choose to solicit, and they forget that *follow-the-leader* is a game for children. They would benefit the profession more by admitting their limitations and stepping aside to allow others to discuss the data, and ensure that our policies and field practices are based on evidence.

Yet another argument sometimes raised against the use of DLCs is the case anecdote, in which individuals refer to a single case as sufficient evidence to influence decisions that affect the profession as a whole. Questions of science are answered by samples and populations, not case studies. Case studies and anecdotes are useful for studying and teaching problems at the onset, but scientific knowledge is based on observations about what happens most often, not an isolated phenomenological experience. Anecdotes and case-studies are useful for asking questions and teaching knowledge for which we are already relatively certain: they are not useful for answering scientific questions, and we will be asking to be misled if we depend on case anecdotes for professional wisdom.

A final argument offered against the use of DLCs has been that the transparency of the DLC provides an invitation to use countermeasures to attack the test questions and alter the test result. Endorsement of this argument requires the belief that the majority of polygraph field examiners are unskilled at identifying deception and faking attempts during polygraph testing. Belief in the concern that DLCs increase vulnerability to countermeasures requires the initial belief that most examinees remain naive about how the polygraph and polygraph questions work. Moreover, this argument neglects the body of evidence and experience suggesting that countermeasures are largely ineffective and present no greater threat when DLCs are used versus PLCs

Conclusions

Studies on the use of DLCs have consistently shown that they can provide accuracy that is as good as or better than PLCs in both screening and diagnostic polygraph formats. While opinions are abundant regarding DLCs and other polygraph matters, it is important to remember that professional opinions are based on data and evidence. It is a simplistic and easy error to forget that an opinion without evidence is a personal opinion, even if it is offered by a professional. Opinions, in the realm of science, are regarded as un-tested hypothesis. It is a humbling fact to educated and intelligent people in fields of science that most hypothesis are discarded as ineffective after being subject to experimental research. At the present time there is no published study that provides evidence of the ineffectiveness or

inferiority of DLCs in detecting truthfulness or deception, when compared to PLCs, and no evidence of increased pragmatic or ethical problems associated with their use. Instead, the abundance of evidence indicates the effectiveness of DLCs and their potential to reduce pragmatic and ethical complications surrounding the polygraph. The presentation of DLCs to the examinee is more standardized, requires less manipulation of the examinee, and is easier to understand by laypersons, examinees, jurors, and professionals alike. They possess greater face validity, higher construct validity, and are less likely to be intrusive and embarrassing to examinees. DLCs are more easily defended in terms of scientific and testing ethics and may have the additional advantage of continued salience with examinees that are repeatedly tested, such as intelligence sources, informant sources, applicants and sex offenders.

While some agency policies may prohibit the use of DLCs, this does not negate the growing body of evidence in their support. Those who are in decision making positions have a responsibility to not be "impervious to data." Those in positions of influence who are "impervious to change" are called upon to reconsider the evidence and not impede professional growth. All are encouraged to adopt empirically-based principles and techniques that have demonstrated sound evidence to support their use.

Based upon the research cited above, we argue that it is empirically valid, and therefore permissible, to use DLCs in place of PLCs in multi-issue and single-issue screening and diagnostic settings, regardless of the technique. The exact name of the techniques, or their developers, is of virtually no importance. What is important is the set of empirical principles upon which a technique is designed and constructed. The evidence at this time provides a strong indication that the major issue of distinction between techniques is the number of issues addressed within a single test and how the test data are analyzed. At the present time we have decades of published scientific studies that clearly indicate that the single-issue examination provides the highest level of diagnostic accuracy, including sensitivity to deception, specificity to truthfulness and low inconclusive rates. In contrast, screening exams are often constructed as multi-issue exams, in an attempt to broaden the sensitivity of the test to multiple areas of concern. DLCs have been shown to be valid and effective in both single-issue diagnostic techniques and multi-issue screening techniques. We argue, in consideration of the evidence, the use of DLCs appears to be a reasonable and empirically valid practice, regardless of the technique or testing format.

Arguments against the use of DLCs rests on opinions alone, without evidence, and these opinions consistently contradict the available data and published studies. Statements advocating the superiority of the PLCs are not founded on data, but rest on blind allegiance to previous training protocols accompanied by blindness to available scientific evidence. It is time for leaders, trainers, and policy makers in the polygraph profession to emphasize an evidence-based, scientific approach to all aspects of polygraph, including testing formats, test question construction, and test data analysis. Theorized solutions based on opinion without evidence (personal opinion or untested hypothesis) must become a piece of the past. The future of the polygraph profession will be ensured by requiring evidence-based practices.

It will do the polygraph profession, our communities, and our country no good, and potentially great harm, to continue to impose arbitrary rules, without evidence. This serves only to paint field examiners into a corner for which they will be accused of conducting examinations improperly if they choose to construct the examination in a manner that is actually supported by scientific studies conducted by reputable scientists at reputable institutions. Furthermore, it does our profession, our communities and our country no good, and potentially great harm, to put field polygraph examiners in an arbitrary rule-bound position in which they are discouraged from advancing the profession and are unable to benefit or make use of knowledge gained from scientific studies that support the validity of the polygraph test as the most advanced scientific method for determining deception and truthfulness. One hallmark of a pseudoscience is a failure to achieve or make use of new knowledge and failure to advance and integrate new knowledge over time. Without science and evidence, dogma and arbitrary rules become the centerpieces and cornerstones of that profession. While rules and policies will always be important in field settings and agencies, policies and rules that prohibit the practice of scientific approaches will ultimately undermine our goals and objectives. The future of polygraph rests with our ability to suspend individual opinion long enough to remain interested in empirical evidence and incorporate any new knowledge into our existing repertoire of scientific polygraph techniques. To reject scientific evidence and neglecting scientific ideas in favor of rigid adherence to arbitrary rules and unfounded opinions is to jeopardize the future of the polygraph profession. It is a form of intellectually painting ourselves into a corner with no way out.

At the present time there is no evidence of any differences in underlying psychological or physiological constructs between the single-issue diagnostic/investigative polygraph techniques (those commonly based on the family of ZCT formats), and multi-issue exams (commonly based on the MGQT formats) used in polygraph screening programs. Differences exist only in the presence or absence of a known problem, base-rates, and the decision theoretic and statistical differences associated with differences in the number of distinct issues. In short, it is not the name of the technique or rigidity of the rules that makes the polygraph accurate or makes the polygraph work. Single-issue and multi-issue comparison question techniques work because of the same basic principles of psychology, physiology, measurement and decision theory. DLCs have been shown to be effective with both single-issue and multi-issue exams. With this in mind the authors argue that it is empirically valid and therefore ethical to use DLCs in any recognized, valid diagnostic or screening polygraph technique. We invite any evidence, not anecdote or opinion, in favor of a counter-argument.

Additional References

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