

# **The Empirical Basis for 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 advantageous or “permissible” to use directed lie comparison (DLC) questions in polygraph testing. More specifically, this question and this related discussion pertains 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 countries, and the individual being tested. Ethics is, after all, a discussion about right and wrong with consideration for what bad or good things happen, and to whom these things happen, as a result of a particular choice of action. The polygraph profession sits at a crucial point of ethical discussions, and these discussions pertain to theories of truth and deception, and also to the competition of rights, priorities and potential impacts that may result in different benefits and consequences for individual persons and groups of people.

It is a goal of science to provide evidence-based models for making decisions about individual cases, and for making policies that affect decisions pertaining to groups of cases. Evidence-based practices allow us to calculate the expected results and probability of error with mathematical precision, and therefore help us to better 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.

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 DLCs, and to anchor a more informed professional discussion regarding matters of scientific validity and polygraph field practices. Administrators, policy makers, and field 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 the opposing counsel during a legal contest. 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 the information in this document will lead to further discussion and improvements in policies and field practices to include the current state of scientific evidence regarding the use of DLCs.

## **Discussion**

### **Summary of the Research Evidence**

Barland (1981) evaluated the effectiveness of DLCs using 56 military subjects who were tested on multiple issues in a laboratory study of screening tests. 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.

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Department of Defense Polygraph Institute Research Staff (1995a) evaluated the effectiveness of the Test for Espionage and Sabotage (TES) which utilizes DLCs. This study included 277 participants and showed that the TES performed with high accuracy that exceeded that of other polygraph screening techniques. It was noted that the use of DLCs reduced the problems associated with the use of probable lie comparison (PLC) questions. The Directed Lie Screening Test (DLST) is structurally identical to the TES, and this alternate name is used in screening contexts in which the investigation target questions pertain to topics other than espionage.

Department of Defense Polygraph Institute Research Division Staff (1995b) further evaluated the effectiveness of the TES which utilizes DLCs. This study included 85 participants and confirmed that the TES performs with high sensitivity to deception and high specificity to truthfulness. These results, at least in part, appear to have led to the federal government's adoption of this technique, which is still in use for screening examinations today (Handler, Nelson & Blalock, 2008).

Honts and Raskin (1988) reported the results of a field study on the validity of the directed-lie control question and noted that the use of DLCs is far more standardized and straight forward than use of PLCs. Results of this study, involving 25 criminal subjects, demonstrated accuracy levels that were statistically significantly greater than chance and support the use of DLCs in criminal testing.

Honts and Reavy (2009) reported the results of an experimental comparison of PLCs and DLCs 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, Kircher, Honts, and Raskin (1997) reported the results of a study which included 60 participants who were tested using a single-issue format, and concluded that there were no significant differences between use of DLCs and the use of PLCs. It was noted that the use of DLCs had far greater face validity, were less problematic and lent themselves to greater standardization than PLCs.

Kircher, Packard, Bell, and Bernhardt (2001) reported the results of a single-issue study involving 336 participants, and concluded that PLCs and DLCs did not produce statistically significant differences. 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.

Nelson, Handler, Blalock, and Hernández (In press), reported the results of a laboratory sample of DLST exams that were conducted in Iraq. Sample cases were blind scored by examiners from the United States and Mexico using the seven and three position models. This study provided additional evidence that examination formats using DLCs can differentiate deception from truth-telling at rates that are statistically significantly greater than chance.

Nelson, Handler, and Morgan (In press) reported the results of DLST exams conducted by Iraqi examiners and scored with the Empirical Scoring System (ESS). Results of this study provided further evidence that the DLST is capable of producing high levels of sensitivity to deception and specificity to truthfulness. Of particular note in this study, is that the examinees in this study were decisively non-naïve, and the examiners had virtually no field experience. An important feature of this study was that the examinations were conducted in Arabic on non-western examinees, demonstrating that DLCs can be effective in other languages and cultures.

Raskin and Kircher (1990) reported the results of a sample of 48 participants who participated in a study on the development of a computer algorithm. It was concluded that DLCs improved test accuracy for both truthful and deceptive subjects. It was suggested 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.

## Response to arguments against the use of the DLC

One of the most common 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. Related to the first argument would be the notion that polygraph techniques are permanently fixed, should never evolve with new knowledge or evidence, and must always be used only in the manner in which they were initially devised. This argument is troubling on its face, and imposes an unfortunate handicap on those who would embrace this view. The principles surrounding the use of DLCs are simple to learn and to apply. All fields of professional work and scientific study are expected to evolve, and all professionals are expected to engage in continuing education and make use of new knowledge and new methods as data reveals the best identifiable practices. This argument implies that because one was not previously exposed to the method, it is not worth knowing. Moreover, such attitudes fuel accusations that polygraph examiners are not professionals and the polygraph test is not a scientifically based form of professional practice. Professions that neglect to advance will eventually cease to exist.

Other arguments against the use of DLCs are based on an inaccurately circumspect view of the psychological and physiological bases of response to polygraph stimulus questions. The traditional hypothesis of “psychological set,” states that the basis of reaction to polygraph questions is fear of consequences if one were to be caught lying (Matte & Grove, 2001). Although not a psychological theory or construct of its own, the term “psychological set” has provided a needed and plausible explanation for examiners not conversant with the range of psychological theories. It has served to make abstract psychological constructs more tangible and usable to field practitioners. However, the psychological set hypothesis would suggest that DLCs would be ineffective simply because they are unlikely to invoke fear. This same hypothesis would seem to suggest that the polygraph would not work with psychopathic persons, who are known to have low levels of fear conditioning. Yet the evidence has shown that DLCs work and that the polygraph does work with psychopathic persons (Raskin & Hare, 1978; Barland & Raskin, 1975; Patrick & Iacono, 1989). Facts are facts, and when evidence and hypotheses do not agree one of them must change.

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 very useful for studying and teaching problems at the onset of inquiry. Anecdotes and case-studies are valuable for asking questions and teaching knowledge for which we are already somewhat certain. Case studies and anecdotes are also useful for demonstrating exceptions to a rule and for demonstrating scientific questions for which we are uncertain of the exact or complete answer. Case studies and anecdotes are not useful for answering scientific questions because they would lead us to attempt to make generalized conclusions based on idiosyncratic or unreliable evidence. We are asking to be misled if we depend on case anecdotes for professional wisdom. Polygraph testing, though very accurate, remains imperfect. Given an opportunity to evaluate enough individual cases, errors or exceptions will be observed. Scientific knowledge is ultimately based on observations about what happens most often for most people, not on isolated phenomenological observations.

A final argument offered against the use of DLCs has been that the transparency of the DLC provides an invitation to use countermeasures intended to alter the test result. 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. Endorsement of this argument also requires the assumption that polygraph field examiners are unskilled and unequipped to identify attempts at tracing manipulation during polygraph testing. To this date there is simply no evidence of any greater increase in countermeasure use, in field settings, resulting from the use of PDD techniques based on DLCs or PLCs.

## Conclusions

There is published and replicated evidence to support the validity of DLCs in both diagnostic and screening polygraph test formats. 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.

Arguments against the use of DLCs are without evidence to support them, and statements advocating the superiority of the PLCs are not founded on 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. Arguments and policies against the use of DLCs are founded on opinion and neglect the scientific evidence. They serve only to make field examiners vulnerable to unwarranted accusations of misconduct if they choose to use evidence-based methods that make use of DLCs. It does our profession, our consumers, our communities and our countries no good, and potentially great harm, to neglect the incorporation of evidence-based practices into the repertoire of skills and techniques available for use in field settings.

Likewise, the abundance of learned opinions indicates that DLCs may offer the potential to reduce pragmatic and ethical complications surrounding the polygraph. The presentation of DLCs is more standardized, requires less manipulation of the examinee, and is easier to understand by laypersons, examinees, jurors, and professionals alike. DLCs possess greater face validity, higher construct validity, and are less likely to be perceived as unnecessarily intrusive. 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 tested repeatedly. With consideration for expectations that professional field examiners may at times need to refer to the basis of scientific evidence supporting their field practices, we argue that the evidence supports the validity of the use of DLCs in both diagnostic and screening contexts. We therefore recommend continued interest in the use of the DLC and continued research on the DLC with the array of presently available test formats.

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A reference list is available upon request.

## References

- 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.
- Barland, G. H. & Raskin, D. C. (1975). An evaluation of field techniques in detection of deception. *Psychophysiology*, *12*, 321-330.
- Handler, M., Nelson, R. & Blalock, B. (2008). A Focused Polygraph Technique for PCSOT and Law Enforcement Screening Programs, *Polygraph*, *37*(2), p. 100-111.
- Honts, C. R. & Raskin, D. C. (1988). A field study of the validity of the directed-lie control question. *Journal of Police Science and Administration*, *16*, 56-61.
- 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.
- 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.
- 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.
- Matte, J. A. & Grove, R. N. (2001). Psychological Set: Its Origin, Theory and Application. *Polygraph*, *30*(3), 196-202.
- Nelson, R., Handler, M., Blalock, B. & Hernández, N. (In press). Replication and extension study of Directed Lie Screening Tests: Criterion validity with the seven and three position models and the Empirical Scoring System. *Polygraph* (manuscript accepted for publication).
- Nelson, R., Handler, M., & Morgan, C. (In press). Criterion validity of the Directed Lie Screening Test and the Empirical Scoring System with inexperienced examiners and non-naive examinees in a laboratory setting. *Polygraph* (manuscript accepted for publication).
- Patrick, C. J. & Iacono, W. G. (1989). Psychopathy, threat, and polygraph test accuracy. *Journal of Applied Psychology*, *74*(2), 347-355.
- Raskin, D. C. & Hare, R. D. (1978). Psychopathy and deception in a prison population. *Psychophysiology* *15*(2) 126-136.

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.

Research Division Staff (1995a). *A comparison of psychophysiological detection of deception accuracy rates obtained using the counterintelligence scope Polygraph and the test for espionage and sabotage question formats*. DTIC AD Number A319333. Department of Defense Polygraph Institute. Fort Jackson, SC. Reprinted in *Polygraph*, 26(2), 79-106.

Research Division Staff (1995b). *Psychophysiological detection of deception accuracy rates obtained using the test for espionage and sabotage*. DTIC AD Number A330774. Department of Defense Polygraph Institute. Fort Jackson, SC. Reprinted in *Polygraph*, 27 (3), 171-180.