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6. AUTHOR(S) Barland, Gordon H., Honts, Charles R.				
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13. ABSTRACT (Maximum 200 words) The validity of the Zone Comparison Test format was examined in an analog study conducted by the Department of Defense Polygraph Institute (DoDPI). Forty subjects were tested by one of six psychophysiological detection of deception examiners (PDDs) after having been assigned to either the innocent group, or the group guilty of committing a mock theft of money. Standard field instrumentation and testing procedures were utilized, and the resulting examinations were evaluated by the original PDD examiner and three other examiners, all of whom were directed to apply either the DoDPI scoring rules or the rules used by the University of Utah. As a group, original examiner accuracy when using the DoDPI scoring rules was 70.0% for both the guilty and the innocent subjects, but was 73.7% and 77.8%, respectively, when the inconclusive decisions were eliminated from the analyses. The numerical scores of the examiners, having been correlated with each other and with the guilt/innocence criterion, ranged from .84 to .90. Three of the four validity coefficients achieved statistical significance. In short, the ZCT format accuracy was lower in this study than in other laboratory studies. A list of possible factors contributing to these findings was provided and the author specifically noted that this study accounted for only 18.5% of the criterion variance, whereas, other studies have typically accounted for 60.0% - 70.0% of the variance.				
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A Laboratory Study of the Validity of the ZCT:
An Executive Summary

Gordon H. Barland, Ph.D. and Charles R. Honts, Ph.D.

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Department of Defense Polygraph Institute
Fort McClellan, Alabama 36205

Abstract

BARLAND, G. H., and HONTS, C. R. A Laboratory Study of the Validity of the ZCT: An Executive Summary. November 1990, Report No. DoDPI90-R-0001 Department of Defense Polygraph Institute, Fort McClellan, AL 36205.--The validity of the Zone Comparison Test format was examined in an analog study conducted by the Department of Defense Polygraph Institute (DoDPI). Forty subjects were tested by one of six psychophysiological detection of deception examiners (PDDs) after having been assigned to either the innocent group, or the group guilty of committing a mock theft of money. Standard field instrumentation and testing procedures were utilized, and the resulting examinations were evaluated by the original PDD examiner and three other examiners, all of whom were directed to apply either the DoDPI scoring rules or the rules used by the University of Utah. As a group, original examiner accuracy when using the DoDPI scoring rules was 70.0% for both the guilty and the innocent subjects, but was 73.7% and 77.8%, respectively, when the inconclusive decisions were eliminated from the analyses. The numerical scores of the examiners, having been correlated with each other and with the guilt/innocence criterion, ranged from .84 to .90. Three of the four validity coefficients achieved statistical significance. In short, the ZCT format accuracy was lower in this study than in other laboratory studies. A list of possible factors contributing to these findings was provided and the author specifically noted that this study accounted for only 18.5% of the criterion variance, whereas, other studies have typically accounted for 60.0% - 70.0% of the variance.

Key words: Zone Comparison Test format, polygraph accuracy, DoDPI scoring criteria, University of Utah scoring criteria, control question test.

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One of the missions of the Department of Defense Polygraph Institute (DoDPI) is to conduct research. In this particular experiment we examined the validity of the zone comparison test (ZCT) technique. This technique is one of the most widely used and scientifically studied techniques, and is taught in the DoDPI Polygraph Examiner Basic Course. We examined the validity of the ZCT in an analog study.

Method

The subjects were 29 male and 11 female enlisted trainees at Fort McClellan. The average age of the subjects was 20.6 years. Subjects were randomly assigned to one of two conditions of equal size. One condition was innocent while the other was guilty of committing a mock theft of money.

Polygraph examinations were conducted by six instructors from the Department of Defense Polygraph Institute (DoDPI). Each used standard field instrumentation and the techniques taught at the DoDPI. During the ZCT polygraph examinations, subjects were treated as if they were criminal suspects.

Regardless of the test outcome, no interrogation or additional testing was conducted. The charts were numerically scored by the examiner immediately following the test, using the scoring rules taught at DoDPI. The scores for each relevant question were summed across the channels and the three charts. Scores of -3 or lower to any relevant question on a test resulted in a deceptive (DI) outcome. If the test was not deceptive, but any relevant question had a score between +2 to -2 inclusive, the outcome was inconclusive. Only if the scores on all relevant questions were +3 or higher was the test categorized as truthful (NDI). The charts were also independently evaluated by two examiners using the DoDPI scoring rules and one examiner using the University of Utah rules.

Results

The overall accuracy of the original examiners is shown in Table 1. Seventy percent of the classifications of innocent subjects were correct, 10% were inconclusive, and 20% were false positive errors. Seventy percent of the classifications of guilty subjects were correct, 5% were inconclusive, and 25% were false negative errors. Excluding inconclusives, 76% of the decisions were correct. This represents statistically significant, but rather modest classification accuracy.

Table 1
Decisions of the Original Examiners

<u>Condition</u>	<u>NDI</u>	<u>INC</u>	<u>DI</u>	<u>Total</u>
Innocent	14	2	4	20
Guilty	5	1	14	20

Additional analyses were conducted on the numerical scores. The numerical scores of the original examiner, the two DoD evaluators and the University of Utah evaluator were correlated with each other and with the guilt/innocence criterion. The resulting correlation matrix is presented in Table 2. Inter-rater reliabilities were good. The validity coefficients (correlations with the criterion) are modest, with one of the DoD evaluators failing to achieve statistically significant accuracy.

Table 2
Correlations of Numerical Scores

	<u>DoD 1</u>	<u>DoD 2</u>	<u>Utah</u>	<u>Criterion</u>
Original	.86***	.79***	.84***	.43**
DoD 1		.90***	.90***	.34*
DoD 2			.86***	.25
Utah				.43**

*p < .05

**p < .01

***p < .001

Discussion

The accuracy of the zone comparison test (ZCT) in this study was lower than that reported in many laboratory ZCT-type control questions tests. Error rates were on the order of 20% and the discriminative power of the numerical scores was modest, accounting for only 18.5% of the criterion variance. This is in contrast to the analog studies at the University of Utah where the numerical scores usually accounted for 60 to 70% of the variance. A number of factors that could possibly account for these lower accuracy rates are:

1. Support troops may be poor subjects for study.
2. There may be important differences between the Institute and other laboratories in the staging of the mock crimes.
3. There may be critical differences in the pretest interviews between laboratories.
4. There are differences in scoring rules.
5. There were no explicit incentives in this study. The control question test may not work well without incentives dependent on the test outcome.

Additional research is needed to determine the causes of these results.