

The Numerical Scoring Analysis Predecessors

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Abstract

In polygraph history, Cleve Backster's "numerical scoring chart analysis" is considered as revolutionizing the manner of polygraph charts analysis. Yet, earlier history of chart analysis, as being reviewed in this publication, lead to the conclusion that the "numerical scoring chart analysis" was more evolutionary rather than revolutionary.

Key words: Chart analysis, Clinical approach, Global analysis, Numerical scoring

Automated scoring algorithm analyzing and interpreting polygraph charts is a standard feature in nowadays polygraphs instruments. It became so basic that we almost forgot that about half a century ago numerical analysis of polygraph charts was not even around let alone automated scoring algorithm.

Until 1960, when Cleve Backster introduced the Backster Zone Comparison Technique, examiners evaluated polygraph charts utilizing the "Clinical Approach" a.k.a. "Global Analysis" technique. As part of this new technique Backster incorporated a new polygraph charts evaluation method which quantified numerically the magnitude of examinees' psychophysiological responses to the relevant question in compare to its' adjacent comparison question, named: the "Numerical Analysis".

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The “Clinical Approach” (a.k.a. “Global Analysis”) – Was the old practice of evaluating polygraph charts. Unlike nowadays practice, which makes methodical comparison between relevant and comparison questions, the “Clinical Approach” considered in addition to the examinees’ psychophysiological responses (as displayed on the polygraph charts) the examinees’ verbal and nonverbal deception behavioral clues as observed in the pretest, and the case data facts as well. According to Krapohl & al. (2012): “(The) information beyond the physiological tracings are considered to produce the final outcome”. According to Matte (1996): “If the two evaluations (of examinees’ behavior and case facts) did not match (the physiological tracing), inconclusive findings would be rendered” (Summers, 1939). Needless to say, that by its’ nature the “Clinical Approach” is alien to the slogan: “Believe your charts”. Furthermore, considering non-polygraphic information (such as: case data and examinees’ behavior clues) may contaminate examiners with a “Confirmation Bias”, which in return may lead the examiners toward the non-polygraphic trend (be it pro or con the examinees) resulting in a vices circle of false outcome.

Backster’s “Numerical Chart Analysis” transformed the polygraph practice by turning the test data analysis from a subjective analysis to an objective analysis resulting in high reliability chart analysis rate.

Pre “Numerical Analysis” chart quantification methods

Almost all publications reviewing the historical development of polygraph tests, mark two revolutionary mile stones: 1947 when John Reid introduced the Comparison Question Test (CQT) which became the fundamental doctrine of almost all test formats and 1960 when Cleve Backster introduced the “Numerical Analysis”. No doubt that both had an enormous impact on the polygraph tests but they were rather **evolutionary than revolutionary**.

The idea of comparison question was practiced earlier, in 1939, when a less famed researchers, Fordham’s University head of Psychology department Professor Rev. Walter G. Summers who suggested a test format which included three “significant” questions (relevant) which were followed and compared to questions that were emotion-provoking questions answered truthfully, but one that the examinee would prefer to hide (“emotional standard”) (Summers, 1939).

As the case with the comparison question, prior to Backster’s introduction of the “Numerical Analysis” various analysis methods which unlike the “Clinical

Approach” distinguish, characterize and rated the examinees’ psychophysiological responses were introduced.

In 1936 John E. Winter practiced a scoring method in where the breathing curve was rated as regular or irregular; light or deep. The blood pressure curve was rated as regular or irregular, and medium or strong. Winter gave three levels of significance to the results of each of the methods: 0 for “no significance, nothing to indicate guilt;” 1 for “some significance and points in direction of guilt;” and 2 for “distinct signs of guilt (Winter, 1936).

The “Asterisks Scoring” analysis was another scoring method that was used by the FBI examiners who examined suspects and witnesses in a 1936 Nazi spy ring in New York. Leon G. Turrou the FBI NY based agent who was in charge of the investigation wrote in his book *Nazi spies in America* that each examinee was asked many relevant questions using the Relevant Irrelevant test format. The examiner conclusion to each of the questions were reported in accordance with the response intensity: one asterisk indicated a mild emotional reaction, two a strong emotional reaction, and three asterisks, a very strong emotional reaction (Turrou, 1938).

The “check-mark” analysis was used by John Reid
in between the 1950’s to the 1980’s.

Horvath described the method (Horvath, 2019): “this method did not require the assignment of numerical values to responses seen on polygraph charts. Rather, it required an assiduous, systematic review of response data to each relevant and comparison question in the collected polygraph charts. Check-marks, varying in strength according to the degree of response to each question (sometimes reported as ‘small’, ‘medium’ or ‘large’), were noted for each question and the accumulated ‘check marks’ for each question were used to indicate the examiner’s chart-based decision; stronger and more frequent marks to comparison questions led to an outcome of ‘truthfulness’ whereas if the stronger, more pronounced checkmarks were seen at relevant test questions, a decision of ‘deception’ was in order”. The rationale of analysis is identical to nowadays Rank Order Scoring System or the Horizontal Scoring System.

In 1959 Backster joined forces with Richard Arther who was a chief associate at John Reid’s operation to establish the National Training Center of Lie Detection in New York City. Contrary to Backster, Arther was a keen follower of the “Clinical

Analysis” (Matte, 1996). Horvath suggest that Arther introduced the “check-mark” method to Backster who “borrowed” the concept and replaced the “check-mark” with figures which led to the birth of the “Numerical Analysis” (Horvath, 2019).

Epilogue

Since the polygraph became a key player in our quest for truth, test data analysis progressed from an overall wandering over the charts to advanced sophisticated automated algorithms which increased the reliability of the test data analysis.

However, practitioners should keep in mind that the polygraph charts and consequently their analysis is but just an outcome and a representation of: an appropriate pretest, precise relevant and effective comparison questions, a validated test format and a properly conducted test. Each of these components may affect the examinee’s psychophysiological responses and consequently the test data analysis and the test outcome. As long as the examiner conducts an effective pretest, phrases well-constructed relevant questions, effectively presents and explains comparison questions, utilizes a validated test format and properly conducts the test, the output of these proper inputs will result (with high probability) in an accurate result. Contrarily, a poorly conducted pretest, ill phrased relevant questions, improperly developed and presented comparison questions, an invalid (or not validated) test format, and improper test conduct can increase the risk of an error, in spite of applying a highly accurate scoring method.

Valid test data analysis procedure increases the **reliability** of polygraph results (i.e. high percentage of agreement between examiners) **BUT** it has **NO EFFECT WHAT SO EVER** on the **validity** of the results (the correlation between the results and the ground truth).

References

- Horvath F.S. (2019), Chicago: Birthplace of Modern Polygraphy, *European Polygraph*, 13,2 (48), 70–71.
- Krapohl D., Handler M. & Sturm S. (2012), *Terminology Reference for the Science of Psychophysiological Detection of Deception*, APA, p. 38.
- Matte J.E. (1996), *Forensic Psychophysiology using the Polygraph*, J.A.M. Publications, Williamsville, NY. p. 41.

Summers W.G. (1939), Science can get the confession, *Fordham Law Review*, 8, 335–354.

Turrou L.G. (1938), *Nazi Spies in America*, Random House, New York.

Winter J.E. (1936), A comparison of the cardio-pneumo-psychograph and association methods in the detection of lying in cases of theft among college students, *Journal of Applied Psychology*, 20, 243–248.

