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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Practice for Conduct of Research in Psychophysiological Detection of Deception (Polygraph)[1]

This standard is issued under the fixed designation E 1954; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers essential and recommended elements in the design, conduct, and reporting of research on psychophysiological detection of deception (polygraph). Analog and field research are addressed separately.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

E XXXX Terminology for Psychophysiological Detection of Deception, Terminology, and Ethics[2]

3. Terminology

3.1 *Definitions*:

3.1.1 For full explanations of terminology relating to psychophysiological detection of deception, refer to Terminology E XXXX.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *utility*—the proportion of results that are conclusive shall be considered a measure of utility, and shall be calculated by dividing the number of results that are conclusive by the total number of observations. The utility value obtained by this method shall not be less than 0.80 for validated techniques. If a technique permits retesting when initial results are not conclusive, the final result after testing is completed shall be the prevailing decision, and that result shall be used in the computation of utility.

3.2.2 *validity*—a polygraph testing technique shall be considered validated if the preponderance of the independent research determines the said technique achieves a criterion-related validity of 0.90 or greater in discriminating between deceptive and truthful subjects. Calculation of criterion-related validity shall be the number of correct decisions divided by the number of conclusive decisions. Decisions not considered conclusive are those labeled "Incomplete", "Inconclusive", "Indefinite", "No Opinion", "Terminated", or others that are not opinions regarding the veracity of a subject's statements. If a testing technique permits retesting when initial results are not conclusive, the final result after all testing is completed shall be the prevailing decision, and that result shall be used in the computation of criterion-related validity.

4. Summary of Practice

4.1 *Laboratory Research*:

4.1.1 Unless subjects must be individually trained or conditioned to achieve some criterion, subject manipulation procedures shall require minimal human interaction. Those portions requiring human interaction shall be standardized to the extent possible.

4.1.2 All procedures shall be described and reported in sufficient detail that others can replicate them. This shall include logistical factors that may introduce systematic error, such as when subject handling allows them to reveal their programming to one another, or arrival times cue testing examiners regarding programming. All research-related materials shall be retained by the researcher for at least five years from date of publication. Reasonable accommodation shall be made to other researchers for access to research documentation and data. Documentation of procedures shall include, but not be limited to, copies of subject instructions, test questions, testing technique, question sequence, description of circumstances and facilities, raw data, and any tape recordings presented.

4.1.3 So far as possible, the only difference between programmed deceptive and programmed nondeceptive subjects should be their participation in the act to which deception occurs during the PDD testing.

4.1.4 Non-exploratory studies shall test a sufficient number of subjects to obtain a statistical power of 0.80 or higher using a 0.05 significance level. Studies that are exploratory in nature; that do not obtain this power level; shall be clearly identified as exploratory studies.

4.1.5 To the extent possible, when conducting validity and reliability studies, participants performing the testing and evaluating the physiological data shall be unaware as to both the programming of the subjects and the base rates of deception. The degree of knowledge of the participants shall be detailed in the report.

4.1.6 All instrumentation shall be fully reported, including

[1] This practice is under the jurisdiction of ASTM Committee E-52 on Forensic Psychophysiology and is the direct responsibility of Subcommittee E52.01 on Research.

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[2] *Annual Book of ASTM Standards*, Vol 14.02.

any modification of standard equipment. When using field instruments, researchers shall report the manufacturer, model, types of recording channels, whether the channels are mechanically or electronically driven, and whether the instrumentation is computerized.

4.1.7 Statements of generalization shall be limited to that which the data, procedures, and statistical methodology can support.

4.1.8 A human subject research review shall be performed by a recognized independent entity for all studies involving the participation of subjects.

4.2 *Field Research*:

4.2.1 The process for selecting cases shall be thoroughly reported, including at least the source, method exclusionary criteria, and subject population. With respect to subjects, the report shall clearly articulate the proportions of the sample that are suspects, witnesses, and victims.

4.2.2 The qualifications of the polygraph testing and chart evaluating participants shall be identified in the report, including formal polygraph training, field experience, and any licensing or certification.

4.2.3 Researchers shall report the degree to which polygraph chart evaluators were kept unaware with regard to extrapolygraphic information. Specifically, they shall report whether the polygraph chart evaluators were aware of base rates, case facts, the study hypothesis, subject verbal behavior, subject gestures, or other extrapolygraphic details. Moreover, researchers shall report whether examiners who participated in the research normally include any of these factors in their decisions during field testing.

4.2.4 All instrumentation shall be fully reported, including any modification of standard equipment. When using field instruments, researchers shall report the manufacturer, model, types of recording channels, whether the channels are mechanically or electronically driven, and whether the instrumentation is computerized.

4.2.5 Statements of generalization shall be limited to those which the data, procedures, and statistical methodology can support. Departures from conventional field practice shall be documented in detail, with an explanation for the nonstandard procedures.

4.2.6 Polygraph chart evaluators shall be informed of the purpose and protocol of the study in advance, so that they are able to provide informed consent for their participation unless such knowledge would influence the performance of the chart evaluators. This requirement shall be satisfied verbally and in writing. This standard shall not preclude the use of historical data. Researchers shall not change the purpose or procedures of the study without advising evaluators in advance, and allowing them to reconfirm their agreement to participate in the study. If evaluators withdraw from the study, this shall be reported anywhere the results of the study are published or presented.

5. Keywords

5.1 field; forensic psychophysiology; laboratory; PDD; polygraph; psychophysiological detection of deception; research; standards; validation