



Standard Terminology Relating to Forensic Psychophysiology¹

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1. Scope

1.1 This is a compilation of terms and corresponding definitions used in forensic psychophysiology. Legal or scientific terms that generally are understood or defined adequately in other readily available sources may not be included.

1.2 A definition is a single sentence with additional information included in notes. It is reviewed every five years, and the year of the last review or revision is appended.

1.3 Definitions identical to those published by another standards organization or ASTM committee are identified with the abbreviation of the name of the organization or the identifying document and ASTM committee; for example, ASME is the American Society of Mechanical Engineering.

1.4 Definitions of terms specific to a particular field are identified with an abbreviation.

2. Significance and Use

2.1 These terms have particular application to the scientific discipline of forensic psychophysiology. In addition, a hierarchy of sources of definitions are used in the development of this terminology. The hierarchy is as follows: Webster's New World Dictionary, Third College Edition; technical dictionaries; and the Compilation of ASTM Standard Definitions. The subcommittee developed a suitable definition after all of the sources in the hierarchy are found wanting.

3. Terminology

3.1 Terms and Definitions:

Air Force modified general question test (AFMGQT), *n*—test format with flexible question orderings and numbers of relevant questions.

DISCUSSION—The AFMGQT can be used in single-issue, multiple facet, and multiple-issue PDD examinations. The AFMGQT uses relevant, comparison, sacrifice relevant and irrelevant questions.

artifact, *n*—a change in a PDD tracing that is not attributable to a review test question, stimulus, recovery, or homeostasis.

cardiovascular tracing, *n*—a display of physiological patterns

of the subject's relative blood pressure and pulse rate.

DISCUSSION—The cardiograph component records this activity.

comparison question, *n*—type of question, the physiological responses from which are compared to those generated by the relevant questions.

counterintelligence-scope polygraph (CSP), *n*—screening examination administered by the Federal Government on individuals with sensitive security clearances to detect and deter espionage, security breaches, sabotage, or other acts against the government.

DISCUSSION—Sometimes referred to as a *loyalty* examination.

Daubert v. Merrell Dow Pharmaceuticals, Inc., *n*—although not a PDD case, the Daubert case set aside the landmark Frye rule's "general acceptability" provisions in favor of the Federal Rules of Evidence.

DISCUSSION—This paved the way for the admissibility of PDD evidence in most jurisdictions.²

deception indicated (DI), *n*—a conventional term for a PDD outcome.

DISCUSSION—A decision of DI means that the physiological data are stable and interpretable and that the evaluation criteria used by the examiner concluded that the examinee was not being completely truthful to the relevant issue. DI corresponds to the term *significant physiological responses (SPR)*.

deception test, *n*—a family of PDD examinations where direct questions are posed to the examinee during physiological recording regarding the examinee's involvement in what is covered in the relevant question.

DISCUSSION—Unlike recognition tests, both truthful and deceptive examinees are aware of which questions are relevant, and direct participation, not just recognition, is tested. Deception tests include PDD comparison question tests and PDD relevant/irrelevant tests.

differential salience, *n*—an expression that characterizes the tendency for the magnitude of physiological responses to reveal the perceived psychological significance an individual attaches to specific stimuli which, under controlled conditions, permits a reliable inference of either recognition or

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² For more information, see *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1992), 509 U.S. 579, 125 L. Ed 2d 469; *United States v. Frye* 54 App D.C. 46, 293 F 1013.

deception by the comparison of response magnitudes to all stimuli within a defined grouping.

disclosure examinations over sexual history, *n*—a clinical polygraph examination intended to explore pre-conviction “lifetime” sexual behavioral histories and activities which include the disclosure of additional victims, sexual education sources, victimization, exposure and utilization of pornography, the onset of masturbation, paraphilias, sexual deviance, and therapeutic issues.

DISCUSSION—It is a utility-designed multiple-issue polygraph test, subject to the successive hurdles decision approach.

electrodermal tracing, *n*—the display of physiological patterns of either skin resistance or skin conductance obtained through exosomatic recording with a galvanograph component.

evidentiary PDD examination, *n*—test procedures that are designed to meet minimum standards for admissibility in court or administrative hearings.

DISCUSSION— Among the necessary components are: electronic recording of the session, use of a PDD technique for which the preponderance of the published peer-reviewed research shows an average accuracy of 90 % or better; individually validated scoring rules, and optimized decision rules. Use of a movement sensor is also recommended.

false negative, *n*—misclassification of a deceptive person as truthful.

false positive, *n*—misclassification of a truthful person as deceptive.

forensic psychophysiology, *n*—the scientific discipline dealing with the relationship and applications of PDD tests within the legal system.

DISCUSSION— It encompasses the academic discipline that provides the student, the practitioner, and the researcher with the theoretical and applied psychological, physiological, and psychophysiological fundamentals for a thorough understanding of PDD tests and the skills and qualifications for conducting PDD examinations. The modifier “forensic” delineates and delimits this discipline from the broader discipline of psychophysiology.

format, *n*—the established sequence or rules for ordering questions for presentation during testing.

homeostasis, *n*—a complex interactive regulatory system by which the body strives to maintain a state of internal equilibrium.

inconclusive, *n*—a PDD examination finding that indicates the testing phase was completed and the data did not contain sufficient or consistent diagnostic information on which to base a definitive decision concerning the truthfulness of the examinee.

investigative PDD procedures, *n*—routine PDD examinations that are used to explore wider issues than evidentiary PDD examinations and are not intended to meet exacting evidentiary standards.

DISCUSSION—Investigative procedures may include applicant testing, PCSOT, and multiple-facet criminal testing.

irrelevant question, *n*—An irrelevant question is designed to be a non-emotion provoking question (also referred to as *norms* or *neutral questions*).

modified general question test (MGQT), *n*—test format patterned after the Reid test and modified by the U.S. military. It contains relevant, irrelevant, and comparison questions.

DISCUSSION—The MGQT is widely used in the field and has a body of validity research.

monitoring examination, *n*—A clinical polygraph examination specifically intended to uncover whether the offender has committed any illegal sexual act(s) with a child or any other sexual act forbidden by law during a sex offender’s period of supervision.

DISCUSSION—The requested test timeframe can be since the imposition of the offender’s parole or probation, since his last test, or since any other period designated by supervision officers. This is exclusively a single-issue polygraph test.

multiple-facet polygraph test, *n*—a test in which the relevant questions cover the same event, though the questions may cover different aspects of that event.

DISCUSSION—Because the relevant questions all relate to the same event, in field conditions the examinee would typically be entirely either truthful or deceptive to all questions, though this is not a condition of the multiple-facet polygraph test. One multiple-facet PDD format is the Reid test.

multiple-issue polygraph test, *n*—a test in which the relevant questions cover two or more areas that are partially or completely independent from one another.

DISCUSSION— Forms of multiple-issue polygraph testing include PCSOT, applicant testing, and counterintelligence screening.

no deception indicated (NDI), *n*—a conventional term for a PDD outcome.

DISCUSSION—A decision of NDI means that the physiological data are stable and interpretable and that the evaluation criteria used by the examiner concluded that the examinee was being completely truthful to the relevant issue. NDI corresponds to the term *no significant physiological responses (NSR)*.

noise, *n*—in PDD, it is the random variation in the recorded data that has no diagnostic value, and when excessive, may take the identification of diagnostic patterns more difficult.

no opinion (NO), *n*—a PDD examination finding which indicates that no decision could be made because the testing protocol was incomplete, distorted, or interfered with in such a way as to prevent proper evaluation.

DISCUSSION—This lack of completion could be due to the failure of the examinee to cooperate, premature termination of the examination, or any other event which prevents the successful completion of testing or the proper collection of the physiological data.

no significant responses (NSR), *n*—results of a screening examination which denote that the screening phase of testing was completed, the examiner deemed the physiological data

interpretable, and there were no consistent and significant responses to any of the relevant questions.

optimal decision rules, *n*—those that restrict the types and proportion of error to those that can be tolerated by the consumers of the polygraph results.

DISCUSSION—Because it is not possible to simultaneously reduce errors of one type (that is, false positives) without increasing errors of the other type, optimal decision rules are central to a judicious and rational process by which the payoff to the consumers of the polygraph decision is greatest and the cost associated with errors is minimized. Optimal decision rules for investigative and evidentiary polygraphy may be different from one another.

peak of tension (POT), *n*—a family of testing procedures, including known solution, searching (probing), and acquaintance tests.

DISCUSSION—There is a body of validation research for the known solution POT.

PDD examination, *n*—a process that encompasses all activities that take place between a PDD examiner and an examinee during a specific series of interactions.

DISCUSSION—These interactions may include the pretest interview, the use of the polygraph to collect physiological data from the examinee while presenting a series of tests, and the test data analysis phase, which may be supplemented in a post-test interview phase.

PDD examiner, *n*—someone who has successfully completed formal education and accredited training in conducting PDD examinations and, if appropriate, is certified or licensed by their agency or state to conduct such examinations.

phasic response, *n*—a response, typically of short duration, where the level of physiological arousal returns to its pre-arousal state.

physiology, *n*—the branch of biology dealing with the functions and vital processes of living organisms or their parts and organs.

polygraph examiner, *n*—a term used synonymously with PDD examiner.

DISCUSSION—In the evolution of terminology within this discipline, the term *polygraph examiners* replaced the antiquated appellation “Lie Detector Operator” (see **PDD examiner**).

polygraph instrument, *n*—a diagnostic instrument used during a PDD examination, which is capable of simultaneously monitoring, recording, and measuring at a minimum, respiratory, electrodermal, and cardiovascular activity as a response to auditory or visual stimuli.

polygraphy, *n*—see **psychophysiological detection of deception (PDD)**.

post-conviction sex offender testing (PCSOT), *n*—see *clinical polygraph examination*.

disclosure examination, *n*—a form of PCSOT which involves an in-depth look at the entire life cycle of an offender and his or her sexual behaviors up to the date of criminal conviction.

DISCUSSION—Sometimes referred to as a *sexual history examination*.

pretest interview, *n*—the earliest portion of the PDD examination process during which the examinee and examiner discuss the test, test procedure, and the details of the test issues.

DISCUSSION—The pretest interview also serves to prepare the examinee for the testing.

psychology, *n*—the science dealing with the mind and with the mental and emotional processes.

psychophysiological detection of deception (PDD), *n*—the academic discipline that provides the student, the practitioner, and the researcher with the theoretical and applied psychological, physiological, and psychophysiological fundamentals for a thorough understanding of PDD tests and the skills and qualifications for conducting PDD examinations (see **polygraphy**).

psychophysiological veracity (PV) examination, *n*—see **psychophysiological detection of deception (PDD)**.

psychophysiology, *n*—the study of interactions between mental and physiological processes.

purposeful non-cooperation (PNC), *n*—a decision of PNC indicates that the polygraph examiner detected the examinee engaging in apparently motivated and repeated behavior contrary to the examiner’s instructions that interferes with the protocol or physiological recordings.

quality control, *n*—the process in which all relevant PDD documents and materials are reviewed by an independent and qualified person to assess whether the testing examiner selected and followed proper methodologies and procedures in the preparation, conduct, analysis, and reporting of a PDD examination.

recognition test, *n*—a family of procedures that are based exclusively on responses that are elicited by the examinee’s identification of crime-related stimuli that have been imbedded among irrelevant but similar stimuli.

DISCUSSION—Among the more common recognition tests are: the POT, concealed information test, reaction time tests, saccadic eye movement test, and evoked potentials P300 odd-ball paradigm tests. The acquaintance (or stimulus) test could also be considered a recognition test. Recognition tests require that the test developer know the crime-related information so that it can be determined whether the examinee also knows this information. This limitation restricts the usefulness of recognition tests to only those circumstances. In contrast to deception tests, recognition tests are not designed to test for involvement in a crime, but only whether the examinee is familiar with the crime details.

relevant question, *n*—a question that pertains directly to the matter under investigation or to the issue(s) for which the examinee is being tested.

respiratory tracing, *n*—a display of physiological patterns of the subject’s breathing activity as recorded by the pneumograph component.

response, *n*—a physiological change that occurs following, and is attributable to, the presentation of an applied stimulus (for example, reviewed test question).

screening examination, *n*—a PDD examination in which the relevant issues are not related to a known event, and during which more than one issue can be addressed within the same test series.

DISCUSSION—Examples include applicant and counterintelligence screening as well as some forms of PCSOT.

series, *n*—a collection of tests in which a common list of questions was used.

significant responses (SR), *n*—results of a screening examination which denote that the screening phase of testing was completed, the examiner deemed the physiological data interpretable, and there were consistent and significant responses to one or more relevant questions.

single-issue polygraph test, *n*—a PDD test in which the relevant questions cover the exact same issue.

DISCUSSION—To be a single-issue polygraph test, the examinee must be able to answer the relevant questions either all truthfully, or all deceptively. An example would be the single-issue zone comparison test.

spot score rule, *n*—a decision rule in which the sum of scores for an individual relevant question is considered in the formation of the final decision in a polygraph case.

successive hurdles, *n*—a process which entails a series of tests or procedures and during which only those persons with a positive result on a step proceed to the next step in the series.

DISCUSSION—In polygraphy, successive hurdles most often applies to screening examinations which begin with a multiple-issue test followed by focused testing on the topic(s) the examinee reacted to on the multiple-issue test. The value of the successive hurdles approach is that it maximizes both accuracy and utility while limiting resource expenditures.

successive hurdles approach, *n*—used in multiple-issue testing, it is a process in which multiple broad areas are covered

together in a single PDD test, followed by tests of only those who have positive results with successively focused PDD tests.

DISCUSSION—The benefit of the successive hurdles process is the efficient use of testing resources to deliver accuracy that would normally only be obtainable with several independent single-issue tests.

technique, *n*—an examination protocol which includes a pretest interview, format, testing requirements, test data analysis, and may include posttest procedures.

test, *n*—the single running of a list of test questions during physiological recording of the examinee.

test data analysis, *n*—the systematic evaluation of the physiological recordings, and for most techniques, entails the assignment of numbers according to patterns of responses to arrive at a decision regarding the examinee's truthfulness or concealed knowledge.

tonic response, *n*—shifting of tonic level, typically in response to changing conditions, as opposed to a sudden stimulus.

DISCUSSION—Tonic responses take several seconds or minutes to occur, unlike phasic responses which tend to be much more rapid. Among the more common PDD methods, the only tests where tonic responses are used as diagnostic information are in the POT tests, where a change in the trend of tonic activity can signal that the examinee is aware that the critical item in the series has passed.

true negative, *n*—correct classification of a truthful person as truthful.

true positive, *n*—correct classification of a deceptive person as deceptive.

4. Keywords

4.1 definitions; forensic psychophysiology; terminology

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