

# GLOSSARY

**A-B Design** One of several possible research designs included under the single-case experimental research method. It involves documenting over a period of time—say, several days or weeks, for example—the signs/symptoms/behavior presented by a client who (a) is initially in need of treatment not yet provided and (b) is then provided with the treatment. The initial phase, called the *baseline phase* and designated by the letter “A,” is that period of time during which no treatment is introduced and the targeted signs/symptoms/behaviors are measured. This is followed by the *treatment phase*, designated by the letter “B,” that spans a period of time during which a treatment is introduced and measures are continued on the targeted outcome(s).

**A-B-A Design** A slight extension of the A-B design in that it involves an additional third phase wherein the treatment is removed and, consequently, the subject is returned to the baseline phase. The intent is to demonstrate the outcome or consequence of a return to the subject's initial status of not receiving treatment.

**A-B-A-B (or Reversal) Design** A slight extension of the A-B-A design in that it involves an additional fourth phase wherein the treatment is reintroduced, thereby creating an intermittent reversal from baseline to treatment that is repeated.

**Allied and Complementary Medicine (AMED)**

A database maintained by the Health Care Information Service of the British Library. It addresses resources available in complementary medicine, palliative care, and numerous professions allied with medicine.

**Alpha Level ( $\alpha$ )** The alpha level also known as the probability of a Type I error. When testing a null hypothesis, a decision to reject the null is always accompanied by an admission that there is a certain probability or likelihood that one may be making an error in doing so, thereby committing the so-called Type I error. That probability level is called the alpha level, and it is typically established before the actual statistical analysis is completed. In the behavioral sciences, an alpha level of .05 is customary; in many of the basic and health science areas of research, though, a lower and more demanding alpha level is set (e.g., .01).

**Alternative Hypothesis ( $H_a$  or  $H_1$ )** An alternative hypothesis (a) is a well-justified prediction of a study's anticipated outcome in the context of the study's population; (b) is consistent with the prediction of the research hypothesis, although referring to the study's population; and (c) typically contradicts the prediction of the null hypothesis and, hence, is literally an alternative to the null.

**Anonymity** This provision in a research study ensures that the researcher has no way of associating a research subject's identity with any information received from that individual.

**APA (2001) Publication Manual** This manual represents the stylistic format and requirements for scientific communication in many health science and behavioral science areas. It is published by the American Psychological Association (APA) and was most recently updated in 2001 (5th ed.).

**Archival Indicators** See Behavioral Measures.

**Association-Oriented Research Strategy** One of three research strategies included under the quantitative research category. As its name implies, this research strategy is oriented to investigating a relationship between/among variables with an initial focus on the possible existence of an association between/among them. This association can take the form of two possibilities: (a) a co-relationship, or correlation, between two dependent variables; and (b) an already established correlation between two dependent variables such that one dependent variable can be predicted from the other dependent variable.

**Assurance of Compliance (with 45 CFR 46)** A statement of an institution's policy and procedures for protecting human subjects that assures compliance with 45 CFR 46. Given that 45 CFR 46 is an overarching framework for the protection of human research subjects, its actual implementation is overseen by the DHHS's Office for Human Research Protections (OHRP). Any institution engaged in human subjects research that is conducted or supported by any agency of the DHHS must have an OHRP-approved *assurance of compliance* (or simply *assurance*).

**Behavioral Measures** A modality of measurement that lends itself to constructs whose nature can be displayed overtly. When such is the case, an appeal can be made to behavioral observations, content analyses, and archival indicators. Behavioral observations entail direct observation, along with the requisite record, of the behavior(s) observed. Content analyses involve a form of behavioral observation that focuses on specific events occurring in various media context such as literature, film, television, and comparable replicas of behavior. Archival research focuses on indicators of past behaviors and/or events via a reliance on historical documents.

**Belmont Report (1979)** In 1979 the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research issued the *Belmont Report*, which speaks to several ethical principles and guidelines covering three major areas: (a) the boundaries between practice and research; (b) basic ethical principles pertaining to respect for persons, beneficence, and justice; and (c) applications of these principles in terms of informed consent, the assessment of risk and benefits, and the selection of subjects.

**Beneficence** One of three basic ethical principles addressed in the Belmont Report (1979), *beneficence* refers to an obligation to ensure the well-being of individuals by (a) doing no harm and (b) maximizing potential benefits while minimizing possible harm.

**Best-Evidence Synthesis Research Method** One of six research methods included under the synthesis-oriented research strategy. It is operationally defined as a research method characterized by several research procedures/features: (a) it builds on the principal advantages of — yet represents an alternative to — the traditional narrative review, critical systematic review, and meta-analytic review methods; (b) it combines attention to both the traditional review's individual studies and methodological and substantive issues and conventional meta-analysis's quantification of effect sizes and systematic study selection procedures; (c) it corrects for a major drawback in conventional meta-analysis wherein the all-inclusive and exhaustive collection of primary studies may include studies not representing the best available evidence in a given research domain; (d) it is *selectively exhaustive* in its identification and collection of primary studies that are eventually meta-analyzed; (e) it appeals to a legal analogy whereby the same evidence that would be essential in one case might be disregarded in another because in the second case there is better evidence available; (f) it is predicated, therefore, on the principle of best evidence and the corresponding a priori criteria used for identifying episodes of best evidence; (g) a priori criteria for best evidence determinations can be proposed for individual research subfields via examining earlier narrative, critical systematic, and meta-analytic reviews; and (h) it focuses, therefore, on the *best evidence* available in a research domain, that is, studies highest in internal and external validity, using well-specified and defended a priori inclusion/exclusion criteria, and using effect size indices as an adjunct to a full discussion of the literature being reviewed.

**Between-Subjects Independent Variable (or Design)**

A between-subjects independent variable, sometimes also known as a between-subjects design, refers to a manner in which participants become affiliated with the two or more comparative groups in a study such that each level of the independent variable involves a separate and distinct group of individuals affiliated with it.

**Biophysical Measures** As the name suggests, this modality of measurement allows a researcher to examine manifestations of an underlying construct by appealing to biological/physiological indicators that may span cardiovascular, pulmonary, blood, urine, saliva, and immunodiagnostic studies. Such measures fall into two possible categories: (a) *in vivo* measurements that occur directly in or on a living organism and include as examples blood pressure and body temperature measures and (b) *in vitro* measurements occurring outside the organism's body as is the case with blood chemistry analyses.

**Bivariate Statistics** Those statistical techniques that allow one to analyze the relationship between *two* variables of interest; hence,

*bi-variate* means *two variables*. For example, the Pearson correlation coefficient ( $r$ ) indicates the degree of relationship between two dependent variables of interest.

**Blended-Methods Approach** See Mixed-Methods Approach.

**Blinding (or Masking)** The research procedure whereby one or more parties in a study (i.e., participant, investigator, and/or evaluator) are unaware of the level of the independent variable to which participants belong. Also see Single-Blind Procedure, Double-Blind Procedure, and Evaluator- (or Analysis) Blind Procedure.

**Boolean Operators** Refers to words such as AND, OR, and NOT that are used when two or more key words are employed in the electronic searching of databases. They make a given search strategy either more exclusive or inclusive, depending on the Boolean operator(s) used.

**Boundaries Between Practice and Research** As articulated in the Belmont Report (1979), *practice* refers to biomedical or behavioral interventions providing diagnosis, preventive treatment, or therapy to a patient or client with a reasonable expectation of enhancing the individual's well-being. In contrast, *research* is an activity implemented to investigate a hypothesis, allow conclusions to be drawn, and consequently advance generalizable knowledge typically conveyed in theories, principles, and statements of relationships uncovered. Admittedly, research and practice may conceivably be addressed in tandem, as is the case when research aims to evaluate a given therapy's safety and efficacy.

**CAM on PubMed** Another feature of PubMed specific to complementary and alternative medicine that was developed by the National Library of Medicine (NLM) in tandem with the National Center on Complementary and Alternative Medicine (NCCAM). Its intent is to facilitate the search and retrieval of needed articles on CAM from the approximately 220,000 citations that constitute CAM on PubMed.

**Case Report Research Method** One of four research methods included under the descriptive-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) the focal point is primarily on a detailed description of the clinical practice itself that defines the treatment plan for a client, (b) this clinical practice treatment plan is described in the context of both the client's profile and the supporting justification for the intervention selected, and (c) in the preceding context, this method then describes the sequence of clinical visits as well as the ongoing and final results of the treatment's effectiveness. Compare with Single-Case Experimental Research Method, Single-Case Quantitative Analysis Research Method, and Case Study Research Method.

**Case Study Research Method** One of four research methods included under the contextual/interpretive-oriented research strategy. It is operationally defined as a research method

characterized by several principal research procedures/themes: (a) the identification of a case entity as a single individual, organization, issue, activity, event, or program of interest that is bounded by certain time and space delimitations; (b) an intensive description and analysis of the case entity reflecting its context and multiple data sources; and (c) the availability of three case study options, namely, an *intrinsic* case study to acquire more insight on the uniqueness of a particular case, an *instrumental* case study to refine or alter a theoretical explanation of an issue or event, and a *collective* case study of several case entities to gain insight on the phenomenon represented across the several cases. Compare with Single-Case Experimental Research Method, Single-Case Quantitative Analysis Research Method, and Case Report Research Method.

**Centralized Information Service for Complementary Medicine (CISCOM)** An electronic database maintained by the Research Council for Complementary Medicine, United Kingdom. It contains randomized trials and bibliographic citations and abstracts pertaining to major complementary therapies.

**ClinicalTrials.gov** A source that provides disease treatment information, inclusive of CAM-oriented therapies, modalities, and substances.

**Cochrane Collaboration** Initiated in 1993 by the National Health Service (NHS) in the United Kingdom and organized around 15 Cochrane Centers established throughout the world. The Cochrane Library is an electronic database produced by the Cochrane Collaboration to document and disseminate high-quality evidence for enhanced decision making by those providing and receiving health care as well as those engaged in health care research, education, and administration. Database components of the Cochrane Library include (a) The Cochrane Database of Systematic Reviews, (b) the Cochrane Controlled Trial Register in bibliographic form, (c) the Database of Abstracts of Reviews of Effectiveness, and (d) the Cochrane Review Methodology Database in bibliographic form regarding the science of research synthesis.

**Code of Federal Regulations, Title 45, Part 46; or (45 CFR 46)** Also known as the *Common Rule*, 45 CFR 46 codifies the federal government's role in protecting human research subjects. Originally it applied only to research conducted or supported by the Department of Health and Human Services (DHHS); however, in 1991 the regulations were revised and made applicable to all federally supported research. This legislation represents a framework, rather than a set of rigidly applied rules, for ensuring the rights and welfare of human research subjects. Its most recent revision occurred in 2001.

**Coefficient of Determination ( $r^2$ )** A measure of effect size that indexes the proportion of variations on one dependent variable that can be explained by the variations on a second dependent variable.

**Cohen's  $d$  Statistic** See Effect Size.

**Combined-Methods Approach** See Mixed-Methods Approach.

**Common Rule** See Code of Federal Regulations, Title 45, Part 46; or 45 CFR 46.

**Competency** "*Competency . . . is a two-dimensional construct [cf. White, 1959]. The first dimension is . . . mastery. In other words, mastery can be thought of as the intellectual component of competency. A competent learner has acquired a variety of learning products. However, competency also consists of the attainment of self-confidence or the sense of being able to cope. This attainment of self-confidence is the emotional or affective component of competency*" (emphases added) (Block & Anderson, 1977, p. 165).

**Concurrent Validity** One of two possible forms of criterion-related validity. Regarding concurrent validity, the external criterion against which a new instrument of interest is being validated would be an already well-established instrument or activity for the designated purpose. If indeed the measurements on the newly designed instrument correlated in a positive manner with measurements on the established instrument or activity, then concurrent validity could be inferred.

**Confidence Interval (CI)** Although various types of confidence intervals may be reported in the results section of a research report, in its most basic form a confidence interval refers to a range of numerical values that has a certain probability of capturing the true population parameter under investigation in a study.

**Confidentiality** This provision in a research study means that although the researcher potentially or actually can associate a research subject's identity with information received from that individual, assurances are given that such associations of one's identity and information will be kept strictly secret, private, and undisclosed.

**Confounding Variable** Any factor in a research study related to the study's participants or the characteristics of the study's setting/circumstance that (a) is initially present as a potentially problematic extraneous variable; (b) is not adequately planned for or accommodated by the researcher; and, hence, (c) has the effect of confusing or obfuscating—quite literally, confounding—the eventual outcome and interpretation of the study.

**Construct Validity** An instrument is said to possess construct validity if it can be demonstrated that it indeed measures the particular abstract concept, or construct, it purports to measure. For instance, an instrument that claims to measure the construct of pain would need to demonstrate a positive correlation with other indicators of the experience of pain.

**Constructivism** Defined as "a relativist ontology (there are multiple realities), a subjective epistemology (knower and subject create understandings), and a naturalistic (in the natural world)

set of methodological procedures" (Denzin & Lincoln, 1994, p. 13, as cited by Miller et al., 2003). Constructivism is the philosophical basis or perspective underlying qualitative research and represents a less extreme view of reality, truth, and values than its historical successor, postmodernism.

**Content Analyses** See Behavioral Measures.

**Content Validity** A typical occasion for interest in content validity is that of an achievement test of subject matter mastery by students. This type of validity refers to the degree of correspondence that exists between (a) an instrument's test items and (b) the learning/performance objectives and associated content coverage taught to the students and for which they are held accountable via the test.

### **Contextual/Interpretive-Oriented Research Strategy**

This is the singular research strategy that operationalizes the qualitative research category. As its name implies, this generic research strategy is oriented to investigations that emphasize three principal themes: (a) researcher immersion in the setting or context of the study's participants; (b) interpretation of a study's dynamics and findings as rooted in the participants' ascribed meanings and understandings; and (c) the preceding themes of immersion and interpretation as occurring in three related yet different contexts, namely, the study's unique set of participants, the nature of the interaction and discourses that occur between/among the participants, and the sociocultural context in which the phenomena being studied occur.

**Control Group (CG)** Used as a basis of comparison to one or more treatment (or experimental) groups, a control group is a comparable group of participants that is not exposed to the experimental treatment or intervention.

**Control Variable** A control variable is any factor in a research study related to the study's participants or the characteristics of the study's setting/circumstance that (a) is initially present as a potentially problematic extraneous variable; (b) is planned for or accommodated by the researcher to ensure that its influence does not confound or confuse the eventual outcome and interpretation of the study; and, hence, (c) typically allows the assumption of group equivalence at the outset of a study when the research focus is on comparing two or more groups regarding a dependent variable.

**Correlational Research Method** One of two research methods included under the association-oriented research strategy. It is operationally defined as a research method characterized by the following three research procedures/features: (a) the existence of a sample of participants that may or may not have been formed by random selection; (b) the measurement of each participant in the sample on two or more dependent variables; and (c) the application of correlational statistical techniques to analyze the data set generated by the measures of the dependent variables.

**Criterion-Related Validity** As the expression implies, criterion-related validity is a generic type of validity that has as its reference point an external criterion by which the validity of the instrument in question is assessed. In this context, then, criterion-related validity is manifested by two subcategories of validity: (a) predictive validity and (b) concurrent validity. Also see Predictive Validity and Concurrent Validity.

**Criterion Variable (CV)** That variable in the predictive research method that is predicted quantitatively by means of another variable of interest (called the predictor variable) using the statistical technique of linear regression.

**Critical Systematic Review Research Method** One of six research methods included under the synthesis-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) it is conducted with a view toward applying scientific strategies in an unbiased way to collect, critique, and synthesize all relevant primary studies that address a specific clinical question; (b) its research question is narrow, falls in the clinical realm, and is defined explicitly regarding the areas of population and setting, condition of interest, exposure to a treatment, and/or one or more specific outcomes; (c) potential researcher bias is controlled via the use of explicit inclusion/exclusion criteria for study selection; (d) it conducts an *exhaustive* search of all relevant primary studies using the explicit inclusion/exclusion criteria; (e) the primary studies' designs, characteristics, data analyses, and results are critiqued and interpreted; (f) the resulting critique and interpretation of the primary studies lead to an objective synthesis of pertinent literature useful for informing clinical practice and suggesting needed research; (g) the absence of meta-analysis precludes the systematic aggregating and integrating of empirical data across the several primary studies for the purpose of better estimating the effects of treatments; and (h) it facilitates decision making and problem solving by clinicians more readily than is typical with only results from a single study, yet does not substitute for appropriate clinical reasoning.

**Cronbach's Alpha** An index of the split-half reliability of an instrument arrived at by estimating the average correlation that would result from all possible ways of splitting an instrument in half.

**Cross-Sectional Design** One of two possible designs considered to be developmental or time sequence designs. In this design, the researcher identifies representative samples of individuals at the specific age or time interval levels of interest and then measures them on the dependent variable at only one point in time.

**Cumulative Index of Nursing and Allied Health Literature (CINAHL)** As its name implies, this is a database established in 1956 to accommodate the professional literature needs of nonmedical health professionals in the nursing and allied health areas.

**Debriefing** The planned postinvestigation explanation of a study's purpose that is given to the research participants. This feature is particularly important in studies that involve any form of deception.

**Deception** This possible feature of a research study involves the researcher either intentionally withholding information about the study from participants (an act of *omission*, or passive deception) or intentionally misleading the participants regarding the true nature of a study (an act of *commission*, or active deception). Naturally, a risks/benefits assessment is critical in this regard and certainly relates to the ethical principle of beneficence.

**Declaration of Helsinki (1964/2000)** In 1964 the World Medical Association (WMA) adopted the *Declaration of Helsinki* that articulates certain ethical principles and guidelines for biomedical research involving human subjects. This was done in response to the need for guidelines more comprehensive than the Nuremberg Code provided. This declaration has been amended several times by the WMA since 1964, with the most recent occurring in 2000.

**Dependent Variable** Also known as a DV, the dependent variable is that factor of interest in a research study that (a) is an outcome measure of concern to the researcher either on its own stand-alone merit or in relation to an independent variable or some other dependent variable and (b) has as possible synonyms such expressions as response variable, output variable, outcome variable, consequent variable, or perhaps effect variable.

**Descriptive-Oriented Research Strategy** One of three research strategies included under the quantitative research category. As its name implies, this research strategy is oriented to investigating one or more dependent variables with a view toward characterizing, portraying, profiling, or—quite literally—describing the one or more dependent variables of interest. There is no attempt, however, to investigate relationships between/among the dependent variables when two or more are considered. Furthermore, because there is no independent variable involved, the issue of examining a relationship between an independent variable and a dependent variable is nonexistent.

**Descriptive Statistics** The family of quantitative analysis techniques that allows one to characterize, portray, or literally describe a data set in succinct and economical ways.

**Developmental or Time Sequence Designs** One of several research designs included under the nonexperimental comparative groups research method. In these designs, the researcher investigates human development changes or the sequencing of behaviors/conditions over time. The nonmanipulated independent variable here is either age or time interval specific.

**Difference-Oriented Research Strategy** One of three research strategies included under the quantitative research category. As its name implies, this research strategy is oriented to investigating

whether or not a difference exists between/among the levels of an independent variable relative to a dependent variable. (As a reminder, the levels of an independent variable refer to the two or more comparison groups that represent varying manifestations of the independent variable.)

**Dismantling or Component Analysis Design** One of several possible research designs included under the single-case experimental research method. Representing somewhat of an elaboration of the multiple treatment design, this design allows a researcher to use a series of treatment phases in contrast with a baseline phase in order to investigate a complex type of intervention. This is accomplished by the researcher adding or subtracting sequentially those individual components that together actually constitute the complex treatment.

**Double-Blind Procedure** A research procedure whereby neither the investigator nor the participant is aware of the participant's group membership (or affiliated level of the independent variable).

**Effect Size** Although various types of effect sizes may be reported in the results section of a research report, one basic form of an effect size refers to the degree or extent of influence or effect of the independent variable on the dependent variable in a study. Accordingly, it may be quantified as (a) the proportion of variation on the dependent variable measures that can be explained or accounted for by the independent variable (i.e., *eta-squared*) and/or (b) the size of the difference between the means of two comparison groups as indicated in standard deviation units (i.e., *Cohen's d statistic*). In the case of a correlational study involving two dependent variables, a second basic form of an effect size measure is the *coefficient of determination* ( $r^2$ ), which indicates the proportion of variance on one dependent variable that is explained by the other dependent variable.

**Effectiveness** A determination that a therapeutic intervention is feasible and has measurable beneficial effects applicable to a broad population of clients/patients in real-world settings. Effectiveness studies typically do not have the degree of research design control present in efficacy studies; however, they tend to emphasize external validity and the generalizability of treatments for which some evidence of efficacy has already been demonstrated. Compare with Efficacy.

**Efficacy** The benefits of a therapeutic intervention demonstrated by way of a comparison between one or more experimental treatments and one or more control or comparison treatments performed in the context of a highly controlled clinical trial. Efficacy studies must be designed so as to encourage replication. This typically implies at least four critical components: (a) a well-defined group of study clients/patients whose condition has been objectively identified via rigorous inclusion/exclusion criteria; (b) the presence of an appropriate control condition for comparison to the experimental condition; (c) the random

assignment of participants to the comparison conditions; and (d) close attention to documenting and ensuring compliance with treatment protocol specifications. Compare with Effectiveness.

**Equivalent or Parallel Forms Reliability** This type of reliability involves the degree to which two forms/versions of the same instrument measure a certain variable consistently for the same group of individuals, with each form/version of the instrument being administered at a different point in time than the other.

**Eta-Squared** See Effect Size.

**Ethics** One of two subdivisions of that branch of philosophy known as axiology. Whereas axiology speaks to the issue of values in general, ethics is its subdivision that addresses values in the context of human behavior. (The second subdivision of axiology is that of aesthetics and concerns itself with values in the context of the appreciation of beauty.)

**Ethnographic Research Method** One of four research methods included under the contextual/interpretive-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) the focal point is on understanding and interpreting human behavior as embedded in a given cultural context; (b) behavior is studied from within the culture of interest (i.e., the *emic* approach) or from outside the culture with cross-cultural interests (i.e., the *etic* approach); (c) reliance primarily is on participant observation and in-depth interviews for data collection purposes; and (d) participant observation implies the role of the researcher as an instrument, that is, the researcher observes in the context of becoming a participant in the culture.

**Evaluation** The process of making a value judgment or an assessment of merit concerning one or more variables of interest that have been measured and analyzed. For example, grading is an instance of evaluation. (Consider the following verbal analogy: Measurement is to testing as evaluation is to grading.)

**Evaluator- (or Analysis-) Blind Procedure** A research procedure whereby the research team member responsible for the statistical analysis of the study's data is unaware of which treatment (if any) the various study participants received.

**Ex Post Facto (After the Fact) Designs** This set of research designs is one of several included under the nonexperimental comparative groups research method. In these designs, the participants selected have (a) already been exposed to a particular treatment/condition or (b) already exhibit a particular trait, characteristic, or outcome.

**Exclusion Criteria** As the expression implies, these are criteria or standards used as a basis for determining which potential participants being considered for a study will indeed be excluded from the study.

**Experimental (or Treatment) Group** Used as a basis of comparison to a control group or yet another variation of the experimental/treatment group, an experimental or treatment group refers to a comparable group of participants to whom the study's treatment or intervention is applied.

**External Validity** The extent to which the conclusions reached in a study can be generalized with confidence from the sample back to the accessible population from which the sample was derived.

**Extraneous Variable** An extraneous variable is any factor in a research study related to the study's participants or the characteristics of the study's setting/circumstance that (a) is not the principal or primary focus of the investigation; (b) is considered—quite literally—extraneous to the study's major emphasis; (c) has the potential to confound or confuse the eventual outcome and interpretation of the study; and, hence, (d) should be accommodated or planned for in the design and implementation of the study.

**Face Validity** A subjective assessment that appeals to the apparent validity of an instrument for its stated purpose. It relates to the extent to which the instrument looks or appears to be pertinent to the measurement task at hand.

**Grounded Theory Research Method** One of four research methods included under the contextual/interpretive-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) most applicable to areas characterized by a paucity of previous research or to establish research areas necessitating new viewpoints; (b) the focal point is on a conceptual or theoretical model that explains an experience or phenomenon in a particular setting that is both relevant to, and problematic for, the study's participants; (c) the researcher attempts to uncover the process useful to the participants in resolving the problem; (d) the foundational construct is social interactionism, which explores how people define reality and how their beliefs impact their behavior; and (e) research activities progress interactively from data generation/analysis to construct identification to theoretical formulation, with the emergent theory rooted or grounded in the original data.

**Holistic Therapy** Reflects (a) the interrelatedness of body, mind, and spirit in the healing process and (b) the diversity of disciplines, professions, and traditions in the pursuit of well-being for the whole person. This eclectic view of the individual also encompasses the social, cultural, and environmental milieu in which the person functions. Health care, accordingly, is responsive not only to conventional interventions but also to those traditions and systems of beliefs and practices that maximize the individual's options for the control of illness and the attainment of wellness.

**Hypothesis** A statement that (a) is founded or justified by way of some conceptual, theoretical, experiential, and/or research basis and (b) predicts a research outcome regarding a study's sample and/or population.

**Inclusion Criteria** As the expression implies, these are criteria or standards used as a basis for determining which potential participants being considered for a study will indeed be included in the study.

**Independent Variable** Also known as an IV, the independent variable is that factor of interest in a research study that (a) is investigated for a possible relationship to a dependent variable; (b) may be manipulated or governed by the researcher; (c) may be nonmanipulable in nature and, hence, a reflection of study participants' characteristics, conditions, or features; and (d) has as possible synonyms such expressions as stimulus variable, input variable, treatment variable, or perhaps causal variable.

**Inferential Statistics** The family of quantitative analysis techniques that allows one not only to test hypotheses in a study, but also to calculate effect sizes and confidence interval estimations as supplements to hypothesis testing.

**Informed Consent** One of three applications of the basic ethical principles addressed in the Belmont Report (1979), *informed consent* by research subjects is the moral requirement derived primarily from the ethical principle of *respect for persons*. Though somewhat controversial, consensus does exist in that informed consent must encompass three critical elements as the researcher attempts to ensure that prospective subjects have all of the required information necessary to make a rational decision regarding their participation in a study. These three elements involve (a) the extent and nature of study-related information provided to potential research subjects, (b) the comprehensibility of the study-related information, and (c) the voluntary nature of the consent if and when it is forthcoming.

**Institutional Review Board (IRB)** Regarding the protection of human and animal subjects in the research process, any institution or agency engaged in such research must designate a review board for the purpose of ensuring both the scientific and ethical integrity of the investigative effort. The Department of Health and Human Services (DHHS), for example, mandates such a review process via an IRB by any agency or institution receiving government funding for human subjects research. This essentially includes all colleges, universities, hospitals, and clinics wherein the research endeavor involves human subjects.

**Integrative Research Category** One of three possible research categories characterized as follows: (a) philosophically driven by somewhat of a hybrid view of reality and truth that recognizes the equally valuable possibilities that exist in both the objective analyses and the subjective interpretations of whatever experiences are investigated; (b) rooted in both numerical and verbal data, but with a concerted effort to synthesize research that has already been generated in the quantitative and/or qualitative realms; and (c) representative of research that highlights two

basic themes, namely, "the whole may indeed be greater than simply the sum of its parts" and "patterns of meaning may unfold in an area of research if a synthesizing approach is taken."

**Internal Validity** The extent to which the dependent variable measures in a study can be traced back exclusively to the influence of the independent variable.

**Inter-Rater Reliability** The degree of consistency, or agreement, between/among two or more observers/raters when assessing a subject's responses at a given point in time.

**Interval Scale** One of four measurement scales, the interval scale uses numbers to name, rank order, and permit the assumption of equal intervals between any two pairs of consecutive points on the scale. This scale, however, does not involve a true or absolute zero point. Examples here include measures of intelligence (IQ), the Celsius temperature scale, or numerical achievement test performance scored from 0 to 100.

**Intervening Variable** Any factor in a research study that is theorized, speculated about, or proposed as a possible explanation of why the researcher obtained the results that were uncovered in the investigation. In a sense, this variable is that factor that explains "why we got what we got" in a study and, accordingly, is also known as an explanatory variable. In the context of a difference-oriented research strategy, this variable is that factor presumed (a) to have *intervened* between the onset of the independent variable and the eventual measurement of the dependent variable and, hence, (b) to explain the uncovered relationship between the independent variable and the dependent variable.

**Intra-Rater Reliability** The degree of consistency with which one observer/rater assigns score ratings to the observed target behavior across two or more occasions.

**Justice** One of three basic ethical principles addressed in the Belmont Report (1979), justice here is understood in the context of "fairness in distribution" or "what is deserved" regarding the possible benefits of research as well as the assumption of its burdens.

**Longitudinal Design** One of two possible designs considered to be developmental or time sequence designs. In this design, the researcher selects a single group of participants and then measures them on the dependent variable of interest at each of several points across time corresponding to the age levels or time intervals defining the independent variable.

**Masking** See Blinding (or Masking).

**Massage Research Agenda Workgroup (MRAW)** An interdisciplinary group of health science professionals convened for a three-day conference in March 1999 by the Massage Therapy Foundation. Its outcomes document identifies five specific recommendations regarding the advancement of research in the



massage therapy profession: (a) build a massage research infrastructure; (b) fund research on the safety and efficacy of massage therapy; (c) fund studies of physiological (or other) mechanisms by which massage therapy achieves its effects; (d) fund studies stemming from a wellness paradigm; and (e) fund studies of the profession of therapeutic massage.

**Massage Therapy** A generic term that denotes both (a) the promotion of health and well-being by way of soft tissue manipulation and movement of the body and (b) a health care profession engaged in by massage practitioners. Specialties within the massage therapy profession are defined by virtue of those client populations served, health conditions treated, and intervention techniques used.

**Massage Therapy Research Database (MTRD)** This database maintained by the Massage Therapy Foundation represents the only consolidated, comprehensive listing of bibliographic citations to the scientific research literature on therapeutic massage and bodywork. It currently contains more than 4000 entries and serves as a reference source to help professionals and the public at large locate articles and other relevant documents.

**Measurement** A research procedure whereby numerical and/or verbal data are collected so as to portray, in as valid and reliable a manner as possible, a factor or variable of interest to an investigator. For instance, testing is a measurement procedure.

**MEDLINE** This electronic successor to the print-based *Index Medicus* includes entries from 1966 to the present and is perhaps the most recognized and widely used of the biohealth databases.

#### **Meta-Analytic Systematic Review Research Method**

One of six research methods included under the synthesis-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) it is an "analysis of analyses" in that it is the quantitative analysis of a large collection of results from earlier primary studies for the purpose of integrating the findings; (b) it views as "subjects" the results from various primary studies that have been systematically selected for scrutiny by way of explicitly declared inclusion/exclusion criteria; (c) already existing analyses across the assembled primary studies are analyzed; (d) characteristics of the assembled primary studies are classified and coded, and these represent the independent variables; (e) outcome measures from the assembled primary studies are converted to a common scale or metric mainly via effect size calculations, and the converted common metric is the dependent variable; (f) advantages include but are not limited to the following: explicitly documented study protocol; inclusiveness of primary studies assembled; systematic investigation of patterns across primary studies via the classifying, coding, and aggregating procedures used; greater statistical power than primary studies; and thorough and objective description of current status in a research domain; and (g) disadvantages include

but are not limited to the following: rarity of exemplary primary studies being described in detail; biases inherent in one or more primary studies potentially undetected and, hence, present in meta-analysis; mechanistic procedures evident at times due to heightened concern over researcher bias; and potential loss of focus on better comprehending the research domain under study.

**Methodological Triangulation** See Mixed-Methods Approach.

**Mixed-Methods Approach** A research approach that uses two or more research methods from both the quantitative and qualitative research categories. It is also sometimes referred to as the blended methods approach, combined methods approach, or methodological triangulation.

**Multiple Coefficient of Determination ( $R^2$ )** Represents the proportion of variability on the criterion variable that can be explained by the combined set of two or more predictor variables.

**Multiple Correlation Coefficient ( $R$ )** Represents the correlation between a combined set of two or more predictor variables and the one predicted criterion variable.

**Multiple-Predictor Design** One of two possible research designs included under the predictive research method. This design is an extension of the single-predictor design in that here two or more predictor variables are used to predict one criterion variable. The inferential statistical technique used to carry out this design is called multiple linear regression (*multiple* because two or more predictor variables are used).

**Multiple Treatment Design** One of several possible research designs included under the single-case experimental research method. Representing somewhat of an extension of the basic A-B design, this design contrasts a baseline phase with two or more treatment phases involving two or more different types of interventions designated, for instance, as "B," "C," and so on.

**Multivariate Statistics** Those statistical techniques that allow one to analyze the relationship among *three or more* variables of interest; hence, *multi-variate* means *three or more variables*. For example, multiple linear regression permits a researcher to use two predictor variables to predict quantitatively a criterion variable, thereby informing the relationship among the three variables of interest.

#### **Naturalistic/Structured Observational Research**

**Method** One of four research methods included under the descriptive-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) the focus is on an individual subject or a group of subjects whose behavior in a typical setting or circumstance is of interest; (b) it investigates one or more dependent variables in the form of the behavior of individuals as enacted in their typical environment or setting; (c) the researcher ensures a detached and neutral observation of the subject(s) so as to safeguard a highly objective description of the target behaviors



(dependent variables); (d) it typically is used for exploratory purposes with the intent of generating a database for decision making and/or hypotheses for future study; (e) it may also be used for confirmatory purposes when actual hypothesis testing is done; and (f) potential difficulties regarding observer bias, subject reactivity, and ethical dilemmas must be anticipated and accommodated via established means.

**No Treatment (or "Do Nothing") Control Group** Used as a basis of comparison to one or more treatment (or experimental) groups, this type of control group refers to a comparable group of participants for whom no treatment or involvement is planned.

**Nominal Scale** One of four measurement scales, the nominal scale uses numbers simply to name or identify variations on a variable. For example, using the numbers "1" and "2" to distinguish between males and females in a study represents the nominal scale of measurement.

**Nonequivalent, Control-Group, Interrupted Time Series Design** One of several possible research designs included under the quasi-experimental research method. It is almost identical to the nonequivalent, control-group, pretest-posttest design, except for the presence here of multiple pretest and multiple posttest measures over time.

**Nonequivalent, Control-Group, Pretest-Posttest Design** One of several possible research designs included under the quasi-experimental research method. It entails the presence of intact groups in lieu of the random assignment of subjects, pretesting before the independent variable is introduced, a control group in comparison to the experimental/treatment group, and posttesting after the independent variable has been introduced.

**Nonexperimental Comparative Groups Research Method** One of four research methods included under the difference-oriented research strategy. It is operationally defined as a research method characterized by the following two research procedures/features: (a) the use of a nonmanipulated independent variable and (b) the designation of comparative groups based on a trait, characteristic, or previous treatment/condition exposure of the participants that already exists rather than a new treatment to which the participants are now being subjected. Regarding this latter feature, the group membership of the participants is a matter of already being "in place" or "intact" as members, or perhaps being randomly selected from two or more strata in the accessible population.

**Nonparametric Statistics** One of two subdivisions of inferential statistics, nonparametric techniques do not make any assumptions of normality or equal variance regarding the distribution of a study's variables in the population from which the sample was derived. Also, nonparametric techniques are appropriate when data are collected on a nominal or ordinal measurement scale.

**Normal Distribution Curve** A graphical display of a distribution of events that appears as a symmetrical bell-shaped curve wherein

the values for the mean, median, and mode are identical. It is sometimes referred to as the "Gaussian distribution."

**Null Hypothesis ( $H_0$ )** Also known as the statistical hypothesis, the null hypothesis is that prediction of a study's outcome that (a) asserts the absence of a statistically significant relationship between/among the study's variables, (b) speaks to one or more characteristics or properties of the study's population, (c) is the focal point in a study's statistical analysis, and (d) provides the basis for inferring a decision back to the study's research hypothesis and alternative hypothesis.

**Null Hypothesis Significance Testing (NHST)** The statistical testing of a study's null hypothesis by way of inferential techniques, done in the context of an alpha level being cited and a power analysis being performed, has been the traditional reliance in the quantitative research realm. Recent calls have been made, though, for NHST to be augmented by *effect size calculations* as well as *confidence interval estimations*.

**Nuremberg Code (1947)** The Nuremberg Code, one outcome of the Nuremberg Military Tribunal of 1946 that tried 23 Nazi physicians for crimes against prisoners of war, is that codification identifying 10 conditions that must be met to justify research with human subjects. Of the 10 conditions cited, the two most critical are (a) the need for voluntary informed consent of the subjects and (b) a scientifically justifiable research design capable of potentially beneficial outcomes for the good of society.

**Open Study** A study wherein there is a complete absence of any form of blinding or masking.

**Ordinal Scale** One of four measurement scales, the ordinal scale serves not only to name or identify, but also to rank order. As an illustration, severity of tension headache may be recorded by a client as moderate (a 1), severe (a 2), or debilitating/critical (a 3). This scale does not necessarily imply that the quantity or quality of the variable measured between a 1 and a 2 is equivalent to that measured between a 2 and a 3.

**P Value ( $p$ )** Also known as the level of significance, the  $p$  value signifies the probability or likelihood of obtaining by chance the results of our statistical analysis if indeed the null hypothesis is actually valid.

**Parameter** A characteristic, property, feature, or attribute of a population.

**Parametric Statistics** One of two subdivisions of inferential statistics, parametric techniques make certain assumptions about the distribution of a study's variables in the population from which the sample came. These assumptions pertain to the normal distribution of a study's dependent variable in the population as well as equal variances, for instance, in the two or more segments of the population from which the two or more comparison groups in the study were derived. Parametric techniques also necessitate

either an interval or ratio scale on which the dependent variable has been measured.

**Partial Correlation ( $r_{12.3}$ )** Signified by the expression  $r_{12.3}$ , partial correlation indexes the correlation between dependent variables 1 and 2, with the influence of dependent variable 3 held constant (or partialled out).

**Partial Correlational Design** One of three possible research designs included under the correlational research method. In this design, the researcher investigates the correlation between the two dependent variables of principal interest, that is,  $DV_1$  and  $DV_2$ , but with an adjustment made so that the influence of a third dependent variable,  $DV_3$ , is cancelled or "partialled" out. This allows a more accurate reading on the correlation between the first two dependent variables in that the unwanted influence of the third dependent variable is mathematically eliminated.

**Pearson  $r$**  Signifies the correlation coefficient for two dependent variables and indexes both the strength and direction of the linear relationship between the two.

**PEdro** An electronic database that provides a broad range of reviews and rated trials in rehabilitation and physiotherapy.

**Phenomenological Research Method** One of four research methods included under the contextual/interpretive-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) the focal point is primarily on the lived experience of each participant in the study; (b) recognition of the ongoing interdependency or interaction between the person and the environment is paramount; (c) the study participant is the only reliable source of insight regarding the meaning of that person's lived experience; and (d) the researcher's strategic role is that of transforming verbal data derived from multiple sources.

**Placebo-Attention Control Group** Used as a basis of comparison to one or more treatment (or experimental) groups, this type of control group refers to a comparable group of participants who are not receiving the investigative treatment, but are instead exposed to a stimulus experience that is inert regarding any direct anticipated impact on the outcome being studied. Although inert, the stimulus experience is typically in the form of interpersonal contact and support that provides those participants with a sense of being attended to and involved.

**Placebo-Sham Treatment Control Group** Used as a basis of comparison to one or more treatment (or experimental) groups, this type of control group refers to a comparable group of participants who are not receiving the investigative treatment, but are instead exposed to a simulated treatment that feigns the intervention of a viable treatment. The *presumed* dynamic treatment provided to the control group is actually a pretended or impostor-type intervention with no actual dynamic or viable potential to influence the study's outcome measure(s).

**Population** In a research context, population refers to that group, set, universe, or macrocosm of study participants that is the focus of an investigation. When such a set of study participants is accessible to the extent that each member can potentially be selected for inclusion in the study, it is then known as an accessible population.

**Positivism** Known as the naïve realist position, this philosophical perspective maintains that there is a reality out there that can be studied objectively and understood (Denzin & Lincoln, as cited by Miller et al., 2003). Positivism is the historical predecessor to postpositivism, a less extreme view of reality, truth, and values that is the philosophical basis underlying quantitative research.

**Postmodernism** Known as the radical doubt position, postmodernism counters the naïve realist position of positivism by asserting that "there can never be a final, accurate representation of what is meant or said, only different textual representations of different experiences" (Denzin, 1996, p. 132, as cited by Miller et al., 2003). Postmodernism is the historical successor to constructivism, a less extreme view of reality, truth, and values that is the philosophical basis underlying qualitative research.

**Postpositivism** "Postpositivism rests on the assumption that reality can never be fully apprehended, only approximated. Postpositivists use multiple methods to capture as much of reality as possible; emphasize the discovery and verification of theories; and apply traditional evaluative criteria, such as validity" (Denzin & Lincoln, as cited by Miller et al., 2003, p. 220). Postpositivism is the philosophical basis or perspective underlying quantitative research and represents a less extreme view of reality, truth, and values than its historical predecessor, positivism.

**Posttesting** Posttesting is a research procedure whereby the study participants are measured on the study's dependent variable(s) for either of two possible purposes: (a) to rely exclusively on the contrast between/among the two or more levels of the independent variable relative to the posttest measure only or (b) to examine the contrast between pretest and posttest performances, relative to the dependent variable, within each level of the independent variable.

**Predictive Research Method** One of two research methods included under the association-oriented research strategy. It is operationally defined as a research method characterized by the following six research procedures/features: (a) the existence of a sample of participants that may or may not have been formed by random selection, (b) the availability of a correlational data set reflecting two or more original dependent variables, (c) the measurement of each participant in the sample on one or more of the original dependent variables, (d) the designation of one of the original dependent variables as a criterion variable, (e) the designation of one or more of the original dependent variables as one or more predictor variables, and (f) the application of correlation-based statistical techniques that reflect the earlier

original data set of two or more dependent variables and that allow predictions.

**Predictive Validity** One of two possible forms of criterion-related validity. Predictive validity is the degree to which an instrument actually predicts a certain outcome for which it is designed. In the health sciences, for instance, an instrument that generates initial evaluation scores and thus enables a researcher or practitioner to predict accurately the period of time until recovery from an injury would be characterized as having predictive validity.

**Predictor Variable (PV)** As the name implies, a predictor variable is that variable in the predictive research method that predicts quantitatively another variable of interest (called the criterion variable) by means of a statistical technique known as linear regression.

**Pretesting** A research procedure whereby the study participants, prior to the introduction of the independent variable, are measured on one or more variables for either of two possible purposes: (a) to establish a baseline record of the participants' reactions regarding the dependent variable under consideration before any type of intervention is introduced or (b) to collect data that become the basis for subsequently identifying the two or more levels of the independent variable.

**Proficiency** "*Proficiency* refers to the efficiency with which the individual makes use of the acquired learning products. While *mastery* refers to the *effectiveness* of the learning process in producing the desired learning product, *proficiency* refers to the *efficiency* of the learning product once it has been acquired" (emphases added) (Block & Anderson, 1977, p. 165).

**Prospective Cohort Design** One of three possible designs considered to be *ex post facto* (or after the fact) designs. In this design the two or more comparative groups are formed in the *present* based on an *already existing exposure* to treatment/condition variations and then followed forward into the *future* with a view toward one or more outcomes being measured.

**PsycINFO** The computerized version of *Psychological Abstracts* maintained by the American Psychological Association (APA). It is an excellent resource for the mind-body aspect of CAM in that it obviously speaks directly to CAM interventions regarding mental disorders, stress management, and behavioral processes as well as neuroimmunology.

**PubMed** An information system inaugurated by the National Library of Medicine (NLM) in 1997 for the purpose of providing free Web access to MEDLINE. Although obviously inclusive of MEDLINE, PubMed contains additional entries that augment the MEDLINE records. Such additional records include in-process citations not yet assigned a medical subject heading (MeSH) as well as supplied-by-publisher records that likewise will eventually be given a MeSH.

**Qualitative Meta-Summary Research Method** One of six research methods included under the synthesis-oriented research strategy. As the name implies, it represents a systematic review method from the perspective of the qualitative research tradition, and is operationally defined as a research method characterized by several principal research procedures/features:

(a) it accommodates the need for qualitative researchers to translate the integrative function of the research process into an approach consistent with the constructivist perspective and its corresponding research methods; (b) it focuses on qualitative reports whose findings are summarized rather than synthesized and, hence, these reports do not lend themselves to a meta-synthesis; (c) it is a form of systematic review or integration of qualitative research findings in a target domain that are themselves topical or thematic summaries or surveys of data; and (d) the summarized findings of these qualitative studies are reminiscent of survey features, typically assume the form of lists and frequency counts of topics and themes, and rely more on naming concepts than interpreting them. (cf. Finfgeld, 2003; and Sandelowski & Barroso, 2003.)

**Qualitative Meta-Synthesis Research Method** One of six research methods included under the synthesis-oriented research strategy. As the name implies, it represents a systematic review method from the perspective of the qualitative research tradition, and is operationally defined as a research method characterized by several principal research procedures/features: (a) it accommodates the need for qualitative researchers to translate the integrative function of the research process into an approach consistent with the constructivist perspective and its corresponding research methods; (b) it incorporates a broad, global, encompassing, umbrella term designating the synthesis of research findings (not simply data) across several qualitative studies so as to render a new interpretation; (c) focus is on integrating qualitative research findings in a target domain that are themselves interpretive syntheses of data, including phenomenologies, ethnographies, grounded theories, and other integrated and coherent descriptions of phenomena or events; (d) the synthesizing function is interpretive given the qualitative research focus as opposed to the more aggregative function found, e.g., in a quantitative meta-analysis; and (e) its major goal is to generate a new and integrative interpretation of findings that is more substantive than those resulting from individual investigations.

**Qualitative Research Category** One of three possible research categories characterized as follows: (a) philosophically driven by a view of reality and truth that emphasizes the subjective, contextual, and highly individualistic perceptions of all that is observed and experienced; (b) rooted primarily in verbal data that by its nature lends itself to alternative interpretations on the part of both the observed and the observer; and (c) representative of research that has historically been emphasized in disciplines

such as anthropology and sociology, but with a somewhat recent emergence in psychology and various health science professions.

**Qualitative Systematic Review Research Methods** Two of the six research methods included under the synthesis-oriented research strategy. They represent systematic review methods from the perspective of the *qualitative* research tradition and are identified as follows: (a) the qualitative meta-synthesis research method and (b) the qualitative meta-summary research method. These two research methods address the qualitative systematic review function from two polar perspectives, namely, a global/general vantage point (i.e., the meta-synthesis) and a particular/specific view (i.e., the meta-summary). (Please see individual entries for each of these two methods elsewhere.)

**Quantitative Research Category** One of three possible research categories characterized as follows: (a) philosophically driven by a view of reality and truth that emphasizes the objective and unbiased approach to scientific investigation; (b) rooted primarily in numerical data that are statistically analyzed once the measurements have been demonstrated to be valid and reliable; and (c) representative of the vast majority of research that has historically dominated the basic, behavioral, and health sciences.

**Quasi-Experimental Research Method** This is one of four research methods included under the difference-oriented research strategy. It is operationally defined as a research method characterized by the following two research procedures/features: (a) the use of "intact" groups of participants (that is, two or more participant groups already formed or in place) for comparison purposes, rather than randomly assigning the study's participants to the comparison groups, and (b) the use of a manipulated independent variable as the study's treatment or intervention.

**Random Assignment** An aspect of the randomization process whereby each member of a sample has an equal and nonzero chance of being included in any one of two or more comparison groups of a study (also known as levels of the study's independent variable).

**Random Selection** An aspect of the randomization process whereby each and every member of an accessible population has an equal and nonzero chance of being included in a sample.

**Randomized Clinical Trial Research Method** See Randomized Controlled Trial (or True Experimental) Research Method for subtle distinction and clarification.

**Randomized, Control-Group, Posttest-Only Design** One of several possible research designs included under the true experimental (or randomized controlled trial) research method. It entails the random assignment of subjects, a control group in comparison to the experimental/treatment group, and a posttest.

**Randomized, Control-Group, Pretest-Posttest Design** One of several possible research designs included under the true experimental (or randomized controlled trial) research method.

It entails the random assignment of subjects, pretesting before the independent variable is introduced, a control group in comparison to the experimental/treatment group, and posttesting after the independent variable has been introduced.

**Randomized Controlled Trial (or True Experimental) Research Method** One of four research methods included under the difference-oriented research strategy. It is operationally defined as a research method necessitating two major research procedures/features: (a) the random assignment of participants to the two or more comparison groups (i.e., the levels of the independent variable) and (b) the use of a manipulated independent variable as the study's treatment or intervention. (Please note that the term *controlled* in the expression *randomized controlled trial* designates that the group being compared to the experimental group is a *no treatment* or "*do nothing*" control group or, possibly, a *waiting-list control group*. As suggested by Hagino (2003), the expression *randomized clinical trial* is preferred when the comparison to the experimental group involves a *comparison treatment control group* as is the case with a *standard treatment control group*, *placebo-attention control group*, or *placebo-sham treatment control group*.)

**Ratio Scale** One of four measurement scales, the ratio scale uses numbers to name, rank order, assume equal intervals, and acknowledge a true or absolute zero point. Examples here would include the Kelvin temperature scale, weight, height, blood pressure, and heartbeats.

**Reliability (of Measurement)** The reliability of a measuring instrument refers to the consistency of measurement that the instrument is demonstrating.

**Reliability of Internal Consistency (or Homogeneity)** In the instance of internal consistency reliability, one examines the stability or consistency of measurement *within* the instrument itself. This is accomplished by "splitting" the instrument in half for data analysis purposes and then proceeding to examine the consistency (via correlational measures) between the two resulting sets of scores. This procedure generates what is sometimes known as a "split-half" reliability.

**Research** At its most basic level, research is a process that explores one or more areas of interest (called factors or variables) by analyzing numerical and/or verbal data so as to advance our understanding. More specifically, research is an activity that allows one to accomplish one or more of the following tasks: (a) to characterize a variable of interest by an appeal to numerical and/or verbal data, (b) to investigate a possible relationship between two or more variables, and (c) to integrate or synthesize data from already published sources concerning one or more variables of interest.

**Research Category** The most global or general level at which the research process is considered. Three research categories exist: (a) the *quantitative* research category, (b) the *qualitative* research category, and (c) the *integrative* research category.

**Research Competency** The mastery of desired research-specific learning outcomes at acceptable levels of performance and the self-confidence usually associated with such mastery. Compare with Competency.

**Research Design** Regarding most, though not all, research methods, this is the first level of specificity or detail beyond the research method to which it belongs and attempts to operationalize. For example, the randomized, control-group, pretest-posttest research design (a) belongs to or is included under the true experimental or randomized controlled trial research method and (b) attempts to operationalize in a specific way that particular research method. Any given research design is driven by the investigator's inclusion/exclusion of certain study components such as random assignment, pretesting, posttesting, and the number and nature of comparison groups, to name but a few.

**Research Hypothesis ( $H_r$ )** A well-justified prediction of a study's anticipated outcome in the context of the study's sample that is typically stated at the outset of a study when the research question is being formulated against the backdrop of what the relevant professional literature has to say about the research problem area.

**Research Literacy and Capacity** "Research literacy is the ability to find, understand, and critically evaluate research evidence for application in professional practice. Research capacity is the ability to conduct research" (Dryden & Achilles, 2003, p. 1).

**Research Method** The first level of specificity or detail beyond the research strategy to which it belongs and attempts to operationalize. For example, the true experimental or randomized controlled trial research method (a) belongs to or is included under the difference-oriented research strategy and (b) attempts to operationalize in a specific way the difference-oriented research strategy. Any given research method is driven by the degree of control the investigator can exercise over the study's variables.

**Research Procedure** The first level of specificity or detail beyond the research design to which it belongs and attempts to operationalize. For example, the research procedure of manipulating an independent variable (a) belongs to or is included under the randomized, control-group, pretest-posttest research design and (b) attempts to operationalize in a specific way that particular research design. Any given research procedure is driven by the one or more activities that actually define and operationalize the procedure. For instance, the protocol used in a massage therapy intervention entails certain activities that define and operationalize the experimental level of an independent variable that is being manipulated in a study.

**Research Strategy** The first level of specificity or detail beyond the general research category to which it belongs and attempts to operationalize. For example, the difference-oriented research strategy (a) belongs to or is included under the quantitative research category and (b) attempts to operationalize in a specific

way the quantitative research category. Any given research strategy is driven by the research question that the strategy is investigating.

**Respect for Persons** One of three basic ethical principles addressed in the Belmont Report (1979), *respect for persons* requires, at the very least, a twofold obligation: (a) to accommodate the autonomy of individuals by acknowledging their opinions and choices and refraining from impeding their behavior unless their actions are harmful to others and (b) to safeguard those individuals who suffer diminished autonomy due to their being immature or incapacitated to an extent that seriously compromises their capacity for self-determination.

**Retrospective Case-Control Design** One of three possible designs considered to be *ex post facto* (or "after the fact"). In this design, the two comparative groups are formed in the *present* based on the *presence of an outcome* (i.e., the case) and the *absence of the same outcome* (i.e., the control), and then they are traced backward in time with a view toward *past exposure* to a treatment/condition.

**Retrospective Cohort Design** One of three possible designs considered to be *ex post facto* (or "after the fact") designs. In this design, the two or more comparative groups were formed in the *more distant past* based on a previous exposure to treatment/condition variations, and then they are followed forward to the *more recent past* with a view toward one or more outcomes having been measured.

**Risks/Benefits Assessment** One of three applications of the basic ethical principles addressed in the Belmont Report (1979), the *assessment of risks and benefits* is the moral requirement derived primarily from the ethical principle of *beneficence*. This assessment should be viewed not only as a responsibility but also as an opportunity for the researcher, a review committee, and a prospective research subject. For all three parties involved, it allows for the systematic gathering of comprehensive information about the research being proposed, with each party to the process having a unique set of concerns regarding the study's potential risks and benefits.

**Sample** In a research context, sample refers to that subgroup, subset, or microcosm of study participants identified/selected according to specific criteria for inclusion in an investigation.

**Scatterplot** A graphical technique frequently used with the correlational research method to display pictorially the nature of the relationship between two dependent variables that are plotted along the x- and y-axes.

**Science Citation Index (SCI)** A database that allows the bibliographic information for, say, a significant article of interest to be traced forward in time so as to identify those later or subsequent sources that cited the article in their reference lists. Someone using SCI, therefore, can identify and retrieve those

later or subsequent sources that are presumably germane to the area of interest because they cited the original significant article.

**Selection of Subjects** One of three applications of the basic ethical principles addressed in the Belmont Report (1979), the *selection of subjects* relates to the moral requirement derived primarily from the ethical principle of *justice*. Justice here is considered at two levels: (a) *individual justice* mandates the selection of subjects in an equitable manner such that preferential or biased factors do not come into play; and (b) *social justice* speaks to the issue of classes or groups of subjects, and the distinction that must be made regarding which classes ought or ought not participate in certain kinds of research based on ability to bear the burdens of research.

**Self-Report Measure** The self-report modality of measurement relies on the individual responding to questions that may be asked regarding the construct under investigation. The precipitating questions may take the form of being open-ended questions, restricted questions, or rating scale questions.

**Simple Correlational Design** One of three possible research designs included under the correlational research method. It allows a researcher to investigate the relationship between two dependent variables by exploring whether or not there is an association between the two variables (i.e., whether or not they co-relate, or are correlated, with each other).

**Simple Interrupted Time Series Design** One of several possible research designs included under the quasi-experimental research method. It is almost identical to the nonequivalent, control-group, interrupted time series design, except for the absence here of a control group for comparison purposes.

**Single-Blind Procedure** A research procedure whereby a study participant is unaware of his or her group membership (or affiliated level of the independent variable).

**Single-Case Experimental Research Method** One of four research methods included under the difference-oriented research strategy. As its name implies, it is operationally defined as a research method characterized by the following four research procedures/features: (a) it focuses on one specific participant, rather than a group of participants; (b) the one specific participant is exposed to a given treatment or intervention representing a manipulated independent variable; (c) the treatment phase, during which the single participant is exposed to the manipulated independent variable, is typically alternated with the absence/withdrawal of the manipulated independent variable, thereby defining the baseline phase; and (d) the original treatment phase may also be alternated with a variation of the original treatment and/or an entirely different treatment, thereby defining alternative treatment phases. Compare with Single-Case Quantitative Analysis Research Method, Case Report Research Method, and Case Study Research Method.

### Single-Case Quantitative Analysis Research Method

One of four research methods included under the descriptive-oriented research strategy. It is operationally defined as a research method characterized by the following five research procedures/features: (a) the focus is on a single participant rather than a group of participants; (b) there is no possible manipulation of an independent variable in that one is not present; (c) instead, there is passive observation/measurement of one or more dependent variables as reflected in the quantitative data collected; (d) it is considered a *confirmatory* single-case quantitative analysis if done for hypothesis testing purposes; and (e) it is considered an *exploratory* single-case quantitative analysis if done for hypothesis generating purposes. Compare with Single-Case Experimental Research Method, Case Report Research Method, and Case Study Research Method.

**Single-Predictor Design** One of two possible research designs included under the predictive research method. This design builds on an earlier simple correlational study in which the Pearson  $r$  was calculated to index the correlation between two original dependent variables. Once these correlational data are in place, the single-predictor design allows the prediction of one of the original dependent variables (now known in this context as the criterion variable) based on a knowledge of the other original dependent variable (now known as the predictor variable). This design makes use of an inferential statistical technique called simple linear regression ("simple" because only one predictor variable is used).

**Standard Treatment Control Group** Used as a basis of comparison to one or more treatment (or experimental) groups, this type of control group refers to a comparable group of participants receiving whatever health care treatment or intervention is recognized as standard or typical for their condition.

**Statistic** A statistic is a characteristic, property, feature, or attribute of a sample.

**Statistical Inference** The appropriate use of measurement and statistical testing are critical procedures that allow a researcher to make two important inferences: (a) The statistical analysis of data collected on a given dependent variable enables the researcher to test the null hypothesis. The decision made regarding the null hypothesis, namely, to reject or fail to reject the null, then permits an inferential decision back to both the alternative and research hypotheses. (b) If indeed a study has employed random selection of participants from an accessible population for the purpose of forming the sample, then the statistical analysis of the study's hypotheses allows an inference of what is learned about the sample back to the accessible population.

**Statistical Power** Also known as power analysis, the statistical power that exists when the data on a given dependent variable are statistically analyzed refers to the probability or mathematical



odds that the analysis will result in a rejection of the null hypothesis when in reality the null is indeed false and, hence, should be rejected.

**Statistics** A research tool involving one or more mathematical techniques used to analyze and better understand a data set generated by earlier measurement procedures; an area of applied mathematics that has as its two major subdivisions both descriptive and inferential quantitative analysis techniques.

**Survey Research Method** One of four research methods included under the descriptive-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) it relies on a direct appeal to a representative/unbiased sample of participants, drawn from a clearly defined population, from whom input is derived on one or more dependent variables; (b) the sampling, data gathering, and instrumentation techniques used emphasize appropriate validity and reliability; (c) it typically is used for exploratory purposes with the intent of generating a database for decision making and/or hypotheses for future study; and (d) it may also be used for confirmatory purposes when actual hypothesis testing is done.

**Synthesis-Oriented Research Strategy** The singular research strategy that operationalizes the integrative research category. As its name implies, this generic research strategy is oriented to investigations that emphasize three principal themes:

(a) combining the accumulation of research studies available in a given area so as to allow the efforts of earlier researchers to have more of a collective impact than would be the case if only individual studies were considered; (b) this combining or accumulating of previous research in a given area into a more manageable and meaningful whole involves, quite literally, an act of integrating or synthesizing the earlier studies whether they occurred in the quantitative or qualitative tradition; and (c) this effort of combining, accumulating, integrating, or synthesizing earlier studies occurs with respect to several varied study features as the following: research problems investigated, populations studied, size of sample derived, methodologies used, degrees of control exerted, data collection instruments employed, data analyses completed, interpretations rendered, conclusions drawn, and needed areas of research recommended.

**Test-Retest Reliability** The degree to which a given instrument measures a certain variable consistently for the same group of individuals across two different points in time.

**Time-Lagged, or Cross-Lagged, Correlational Design** One of three possible research designs included under the correlational research method. In this design, the study's participants are measured on two dependent variables at each of two different points across time. Once this is done, the researcher can then calculate the Pearson  $r$  for the two dependent variables at both time point 1 and time point 2. More important, one can then examine

further the correlation coefficients for several pairs of dependent variables in different combinations at various points in time.

**Traditional Narrative Review Research Method** One of six research methods included under the synthesis-oriented research strategy. It is operationally defined as a research method characterized by several principal research procedures/features: (a) its intent is to characterize the current state of knowledge in a given research area by giving a broad-based perspective on the topic; (b) it provides a *selective*—though not necessarily exhaustive—coverage of previous independent studies on a given research problem; (c) it is most appropriate for portraying the history or development of a problem area, describing encouraging developments if available research is sparse or limited by faulty methodologies, and conceptually integrating two or more previously unrelated areas of research; (d) its focus may be on either original data-based studies wherein numerical and/or verbal data were analyzed or possibly studies primarily conceptual or theoretical in nature that inform a chosen research problem area; (e) it relies on a narrative summary of the procedures and results of various studies addressing a focused problem area; (f) it attempts to formulate conclusions across various studies so as to inform the theory surrounding the problem area; (g) it potentially provides insight on those mechanisms underlying the results of the individual studies reviewed; (h) it potentially forms theory-based categories of studies and compares their findings, thus resulting in conclusions not possible via any one earlier study; (i) it potentially summarizes the current state of research in a problem area and suggests needed avenues of future research; and (j) it is limited by the following: seldom exhaustive in coverage of studies in a research area, possible research bias in selection of studies to review, frequent absence of specific inclusion/exclusion criteria for study selection, typical absence of systematic weighting of different study features, inconsistency in identifying which studies constitute the bulk of research evidence, and questionable value in providing detailed quantitative insight on specific clinical issues.

**Treatment (or Experimental) Group** See Experimental (or Treatment) Group.

**True Experimental (or Randomized Controlled Trial) Research Method** See Randomized Controlled Trial (or True Experimental) Research Method.

**Uniform Requirements for Manuscripts Submitted to Biomedical Journals** Represents the stylistic format and requirements for scientific communication in many health science areas. It is produced and maintained by the International Committee of Medical Journal Editors (ICMJE) and was most recently updated in November 2003.

**Univariate Statistics** Refers to those statistical techniques that focus on quantifying *one* particular variable of interest; hence,



*uni-variate* means *one variable*. For example, the mean or arithmetic average of a set of scores is a univariate statistic.

**Validity (of Measurement)** Refers to the degree or extent to which the instrument is actually measuring what it claims or purports to be measuring.

**Variable** That aspect or factor of interest in a research study that has the potential to vary, change, or be altered.

**Waiting-List Control Group** Used as a basis of comparison to one or more treatment (or experimental) groups, this type of control group refers to a comparable group of participants who are not initially receiving the investigative treatment or intervention during the actual conduct of the study, but are instead literally on a "waiting list" scheduled to receive the treatment once the study is completed.

**Within-Subjects (or Repeated Measures) Independent Variable (or Design)** A within-subjects (also known as repeated measures) independent variable (or design) refers to a manner in which participants become affiliated with the two or

more levels of the independent variable in a study such that a specific group of participants actually experiences each and every level of the independent variable.

## REFERENCES

- Anderson, L. W., & Block, J. H. (1977). Mastery learning. In D. J. Treffinger, J. K. Dent, & R. E. Ripple (Eds.), *Handbook on teaching educational psychology* (pp. 163-185). New York: Academic Press.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (1994). *Handbook of qualitative research*. Thousand Oaks, CA: SAGE Publications, as cited by Miller et al., 2003.
- Dryden, T., & Achilles, R. (2003). *Massage therapy research curriculum kit*. Evanston, IL: AMTA Foundation.
- Fingfeld, D. L., (2003). Metasynthesis: The state of the art—so far. *Qualitative Health Research*, 13(7), 893-904.
- Sandelowski, M., & Barroso, J. (2003). Creating meta-summaries of qualitative findings. *Nursing Research*, 52(4), 226-233.