

Subject Index

A

A-B-A-B design, 316–17
A-B-A design, 315–16
A-B design, 314–15
Abscissa, 178
Abstracts, 336–38
Achievement tests, 78–79
Acknowledging participants, 375
ACT (American College Test), 66, 77, 148, 149, 151, 172, 173
Air Crib, 16
Alpha errors, 199
Alternative research designs, 300–330
 internal validity and, 300
 posttest-only control-group design, 305–7
 pretest–posttest control group design, 304–5
 quasi-experimental, 321–30
 single-case experimental design, 308–20
 Solomon four-group design, 305
A (measurement), 314
American Psychological Association (APA), 7, 8, 25
 code of ethics, 30, 32–38
 Ethical Standard 8 for the Conduct of Research, 32–33
 Ethical Standard 8.09–Humane Care/Use of Animals, 39
 Ethical Standard 8.10–8.15—Reporting/Publishing, 46
American Psychological Society, 8
Analysis, 4
Analysis of variance (ANOVA), 244
 for factorial designs, 284–85
 one-way, 244, 248–56
 rationale of, 245–47
 repeated-measures, 244
 two-way, 287–96
 types of, 244
Analytic statements, 92
Animal Care and Utilization Committee, 29, 39
Animal Learning & Behavior, 162
Animals, ethical use of, 38–39
Animal Welfare Act of 1966, 39
ANOVA. *See* Analysis of variance (ANOVA)
APA-format research report, 50, 333–85
 abstracts, 336–38
 APA editorial style, 376
 apparatus subsection, 346
 appendices, 362
 author notes, 362–63
 bias in language, 375
 checklist for APA formatting, 377–79
 discussion section, 353–56

 headings, 195
 introduction, 338–43
 manuscript preparation, 376
 materials subsections, 344–45
 method section, 343–53
 participants subsection, 343–44
 procedure subsection, 346
 reference section, 342
 results section, 348–53
 testing instrument(s) subsection, 346
 title page, 334
 writing guidelines, 371–73
Apparatus for experiments, 129–31
 dependent variable recording and, 131
 individual variables and, 129–30
Apparatus subsection, APA format, 346
Appendices, 362
Aptitude tests, 79
Archival and recorded data sources, 59–61
 compared to experimental method, 61
 potential problems, 60–61
Archives of the History of American Psychology, 60
Arousal reduction, 6
Association for Psychological Science (APS), 25
Asymptotic, 254
Attitude questionnaires, 149
Author notes, 362–63
Availability of participants, 127–28
Axial coding, 55

B

Back translation, 144
Balancing, 115–16
Bar graphs, 177–78
Baseline, 312
Baseline measurement, 312
Beta errors, 199
Between-groups variability, 215, 244, 245
Between-subjects comparison, 208
Between-subjects factorial designs.
 See Random assignment
Bias
 language, 375
B (measurement), 314
Books, citations for, 360
 chapters from edited books, 360–61
Bystander effect, 94

C

Carryover effects, 122–23
Case studies, 54
Case-study approach, 309
Cause-and-effect relations, 89–91, 300
 internal validity and, 300

 Central tendency, measures of, 173–76
 choosing, 174–76
 mean, 174
 median, 174
 mode, 174
Chapters from edited books, citation for, 360–61
Citations, 26, 342
 for books, 360
 chapters from edited books, 360–61
 periodical articles, 359–60
 for periodical articles, 359–60
 of references, 45
 for World Wide Web sources, 361
Classroom lectures, research ideas from, 19
Code of ethics
 American Psychological Association (APA), 30
Cognitive dissonance theory, 5
Cohorts, 82
College students as participants
 experimental validity and, 163–64
Comparative psychology, 162
Complementary information, APA format, 350–53
Complete counterbalancing, 119
Completely randomized ANOVA, 244
Completely randomized designs.
 See Random assignment to groups
Completely within-groups (within-subjects) designs. *See* Non random assignment to groups
Computer statistical output
 interpretation of, 248–56, 287–96
Concurrent validity, 77
Conditional matrices, 56
Confirmability of data, 51, 87
Confounded experiments, 105, 208–9, 235
 internal validity and, 300
Confounders, 103–5. *See also* Extraneous variables (confounders)
Confounding, 105, 300
Constancy, 114–15
Content validity, 77
Contradictory statements, 92
Control, 87–88
Control groups, 206
Control of extraneous variables
 balancing, 115–16
 constancy, 114–15
 counterbalancing, 116–24
 elimination, 114
 randomization, 113
Control procedures, 235
 random assignment as, 235
Control techniques, 113–24

- Convenience sampling, 163–64
 Correctness, 106
 Correlated assignment to groups, 209–13
 matched pairs/sets, 210, 236, 268, 269
 natural pairs/sets, 212–13, 237, 270
 repeated measures, 211–12, 236–37, 269–70, 311–12
 within-subjects comparison, 212
 Correlated groups, 235, 268
 Correlated-groups designs, 215–17
 Correlated samples, 235–38. *See also*
 Non-random assignment to groups
 one-way ANOVA for, 253–56
 two-way ANOVA for, 291–93
 Correlation, 188–92
 correlation coefficient, 188–91
 perfect positive, 190
 zero correlation, 188
 Correlational studies, 3, 66–68
 Correlational research, 67–68
 nature of correlations, 66–67
 Correlation coefficient, 188
 Pearson product-moment, 191–92
 Counterbalancing, 116–24
 carryover effects, 122–23
 complete, 119
 differential carryover, 123–24
 incomplete, 119–21
 sequence or order effects, 121–22
 within-group, 117–19
 within-subject, 117
 Credibility of data, 51
 Criterion validity, 77
 Cross-cultural psychology, 141–42, 166
 cultural immersion, 53
 effect on research, 143
 ethnocentrism, 142
 experimental hypothesis and, 143
 fundamental attribution error and, 142
 knowledge, truth and, 142
 methodology and analysis, 143–45
 methodology and analysis issues, 143–45
 participants/sampling procedures, 143–44
 research and, 141–45, 143
 research effects, 143
 survey or questionnaire type and, 144
 variable selection and recording, 143
 Cross-sectional research, 82
 Cultural response set, 145
- D**
- Data
 confirmability of, 51
 credibility of, 51
 demographic, 74
 dependability of, 51
 fabrication of, 43–44
 qualitative, 51–52
 transferability of, 52
 Debriefing sessions, 37–38
 Deception, 34, 37–38
 Decisions, 4
 Deductive logic, 94–95
 Definitions, operational, 101
 Degree or amount, 106
 Degrees of freedom, 195, 216–17
- Demand characteristics, 135–36, 138, 161
 Demographic data, 74
 Denatonium saccharide, 15
 Dependability of data, 51
 Dependent variables (DV), 3, 89, 105–8, 204–5
 characteristics of, 108
 recording more than one, 107–8
 recording or measuring, 106–7, 131
 reliability of, 108
 selection of, 106
 two-group design and, 204
 validity of, 108
 Descriptive research methods, 3, 59–66
 archival and recorded data sources, 59–61
 choosing behaviors and recording techniques, 63–66
 naturalistic observation, 61–63
 reactance or reactivity effect, 62
 Descriptive statistics, 171–86, 350
 Design. *See* Experimental design
 Differential carryover, 123–24
 Diffusion (imitation of treatment), 154, 305
 Directional research hypotheses, 96
 Discussion section, APA format, 353–56
 comparing results to previous research, 353–56
 interpreting results, 356
 restating results, 353
 Double-blind experiments, 138
 DV. *See* Dependent variables (DV)
- E**
- Economy of expression in writing, 372
 Editorial style, APA, 376
 Effect size, 200
 Elimination, 114
 Emic, 142
 Empirical measurements, 86–87
 Environmental generalization, 158
 Environmental variables, 102
 Errors
 fundamental attribution, 142
 Type I (alpha), 199, 289
 Type II (beta), 199
 Error variability, 215, 245, 285
 in factorial design, 284–85
 Ethics in psychological research
 animals, use of, 38–39
 at end of research, 42–47
 of experimenters, 40
 Institutional Review Boards (IRB), 29, 39–40
 need for, 29–32
 obligations of researcher, 40
 of participants, 40–42
 Ethnocentrism, 142, 166
 Ethnographic inquiry, 52–53
 Etic, 142
Even the Rat Was White (Guthrie), 165
 Everyday occurrences, research ideas from, 17–18
 Expectancies, experimenter, 133–34, 134–35
 Experience independent variables, 102
- Experimental analysis of behavior, 310–11
 Experimental design, 203–19, 231–42, 259–81
 alternative designs, 300–30
 factorial design, 260–72
 factorial *versus* two-group and multiple-group designs, 273–76
 multiple-group design, 232–38
 multiple-group design, variations on, 241–42
 multiple-group *versus* two-group, 238–40
 multiple-independent-groups *versus* multiple-correlated-groups, 240–41
 statistics and, 220–21
 Experimental groups, 206
 Experimental hypotheses, 6, 91–97.
 See also Research hypotheses
 culture and, 143
 Experimental mortality, 305
 Experimenters
 characteristics of, 133
 controlling effects of, 134–35
 expectations of, 133–34, 134–35
 as extraneous variables, 132–35
 Hawthorne effect and, 62
 physiological and psychological effects of, 134
 reactance or reactivity effect and, 62
 responsibilities of, 40
 Rosenthal effects and, 134
 Experiments, 3, 88–89
 confounded, 105
 true, 219
 Ex post facto research, 3, 69–70, 219, 242, 278
 External validity, 157–69
 culture and, 166
 demand characteristics and, 161
 generalization and, 157
 methodological threats to, 159–62
 multiple-treatment interference, 162
 need for, 167–69
 participant threats to, 162–66
 race and, 165–66
 reactive arrangements, 161
 Extraneous variables (confounders), 89, 103–5, 113, 206, 300
 control of, 112–24. *See also* Control of extraneous variables
 experimenters as, 132–35
 participants as, 135–39
- F**
- Fabrication of data, 43–44
 Factorial design, 260–72
 assignment to groups, 268
 comparing different amounts of an IV, 277–78
 control issues in, 276–77
 error variability, 284–85
 experimental questions, 276
 interpreting statistics in, 287–96
 mixed assignment to groups, 271–72
 with more than two IVs, 278–81
 naming, 283–84

- nonrandom assignment to groups, 269–71
- number of groups or levels, 261–68
- number of independent variables, 260–61
- post hoc comparisons, 296
- practical considerations, 277
- random assignment to groups, 269
- rationale of factorial ANOVA, 284–85
- selection of, 276–77
- statistical analysis of, 283–84
- three-way, 279–81
- treatment variability, 284–85
- versus two-group and multiple-group designs, 273–76
- using measured IVs, 278
- variations on, 277–81
- Factors, 259. *See also* Independent variables (IV)
- Failure to replicate, 18
- Falsifiability, principle of, 93
- Figures, 350. *See also* graphs
- Findings
- significance of, 7
- Focus groups, 53–54
- Follow-up tests (post hoc comparisons), 251, 296
- Forced alternative questions, 72
- Freedom, degrees of, 195
- Frequency polygons, 178
- Fundamental attribution error, 142
- G**
- General implication form, 92–93
- Generalizability. *See also* Transferability
- participants and, 127
- Generalization, 157–59
- environmental, 158
 - population, 158
 - temporal, 158
- General Social Survey (GSS), 60
- Good participant effect, 136–37
- Grammatical guidelines, 373–75
- Graphs
- bar graphs, 177
 - frequency polygons, 178
 - histograms, 177
 - line graphs, 178–81
 - pie charts, 176–77
- Grounded theory, 54–56
- axial coding in, 54
 - conditional matrices in, 56
 - open coding in, 54
 - process models in, 55
 - selective coding in, 54
 - transactional systems in, 55
- Groups
- assignment to, 207–13, 234–38, 268–72
 - experimental versus control, 206–7
- H**
- Hawthorne effect, 62
- Headings for APA-format research, 195, 334, 363–64
- Level 1 headings, 336, 364
 - Level 2 headings, 364
 - Level 3 headings, 343, 364
 - Level 4 headings, 363, 364
 - Level 5 headings, 364
- Heterogeneity of variance, 223
- Histograms, 177
- History, 147–48, 304
- History effects, 78
- History of Experimental Psychology, A*, 49
- Homogeneity of variance, 223
- How to Lie with Statistics* (Huff), 45
- Human subjects
- debriefing sessions and, 37–38
 - deception and, 34, 37–38
 - ethical principles related to, 32–34
 - informed consent, 29, 34–36
 - participants at minimal risk, 36
 - participants at risk, 36
 - right to withdraw, 34–35
 - vulnerable populations and, 36–37
- Human Subjects Review Panel, 29, 39
- Hypotheses, 4, 6. *See also* Experimental hypotheses; Research hypotheses
- Hypothesis testing
- new view of, 95–97
- I**
- Idea presentation, 372
- Ideas, research, 14–19
- Imitation of treatment (diffusion), 154
- Incomplete counterbalancing, 119–21
- “In Defense of External Invalidity” (Mook), 167
- Independent groups, 208, 217, 235, 268
- Independent-groups designs
- advantages of, 217
- Independent samples, 235. *See also* Random assignment
- one-way ANOVA for, 248–53
 - two-way ANOVA for, 287–91
- Independent variables (IV), 3, 69, 88, 204–5, 232, 259
- apparatus and, 129–30
 - experience, 102
 - measured, 218–19, 278
 - more than two, 278–81
 - multiple-group designs and, 232–33
 - participant, 102–3
 - physiological, 102
 - presentation of, 129–30
 - stimulus or environmental, 102–3
 - two-group design and, 204
 - types of, 102–3
- Index term selection, 20–21
- Inductive logic, 94
- Inferential statistics, 171, 192–99
- null hypothesis, 192
 - one-tail versus two-tail tests, 196
 - significance and, 192
 - significance testing, logic of, 196–99
 - t* tests, 193–95
- Informed consent, 29, 34–36
- Inspiration, research ideas from, 16
- Institutional Review Boards (IRB), 29, 39–40
- Instrumentation, 305
- Instrumentation and automation, 135
- Instrumentation (instrument decay), 150, 305
- Interactions, 264
- in factorial designs, 285–87
 - with selection, 153–54, 304
 - of selection and treatment, 160–61
 - synergistic effects, 286
 - of testing and treatment, 159–60
- Interlibrary loans, 25
- Internal validity, 300
- alternative research designs and, 300
 - cause-and-effect relations and, 300
 - confounding and, 300
 - diffusion or imitation of treatment, 154
 - experimental design and, 304–7
 - history and, 147–48
 - instrumentation (instrument decay) and, 150
 - interactions with selection and, 153–54
 - maturational and, 148
 - mortality and, 152–53
 - nonreactive measures, 149–50
 - practice effect and, 148–49
 - protecting, 155, 303–7
 - random assignment and, 303–4
 - reactive measures and, 149
 - research design and, 303–7
 - selection and, 151
 - statistical regression and, 150–51
 - testing and, 148–50
 - threats to, 147–54
- Internet searches, 21
- evaluating resources, 24–25t2–2
 - literature reviews and, 21–23
- Interobserver reliability, 65
- Interrater reliability, 77
- Interrupted time-series design, 327–30
- Interval scale, 172
- Interviews
- personal, 75–76
 - telephone, 76
- Introduction, APA format, 338–43
- Inventories, 3, 76–79
- IV. *See* Independent variables (IV)
- J**
- Journal of Applied Behavior Analysis*, 311, 313
- Journal of Experimental Psychology: Animal Behavior Processes*, 162
- Journal of Psychological Inquiry*, 8, 10
- Journal of Psychology and the Behavioral Sciences, The*, 9
- Journal of the Experimental Analysis of Behavior*, 311
- Just noticeable difference (jnd), 310
- K**
- KISS principle, 277
- Knowledge, acquisition of, 3–4
- Knowledge acquisition, 3–4
- L**
- Labels, 375
- Language bias, 375
- labels, 375
 - level of specificity, 375

- Latency or duration, 106
 Level 1 headings, 336, 364
 Level 2 headings, 364
 Level 3 headings, 343, 364
 Level 4 headings, 363, 364
 Level 5 headings, 364
 Levels, 206, 233
 Likert-type scales, 72
 Line graphs, 178–81
 Literature reviews, 4, 5
 computerized research, 21–23
 conducting, 20–28
 index term selection, 20–21
 integrating results of, 25–28
 relevant publications, obtaining, 23–25
- Logic
 deductive, 94–95
 inductive, 94
 knowledge and, 3–4
- Longitudinal research projects, 82
 Lying with statistics, 45
- M**
- Mail surveys, 74–75
 Main effects, 264
 Manuscript page header, 334
 Manuscript preparation, 376–79
 Marginal significance, 288–89
 Matched pairs/sets, 210, 236, 268, 269
 Matching variables, 235, 236
 Materials subsections, 344–45
 Maturation, 148, 304
 Mean, 174
 regression to, 150–51
 Mean squares, 249
 Measured independent variables, 278
 Measurement, 172
 baseline, 312
 central tendency, measure of, 173–76
 of dependent variables, 106–7
 graphing, 176–81
 scales of, 172–73
 variability, measures of, 182–86
 Measure of central tendency, 171–72, 173–76
 Median, 174
 Method section, APA format, 343–53
 apparatus subsection, 346
 materials subsection, 344–45
 participants subsection, 343–45
 procedure subsection, 346–48
 testing instrument(s) subsection, 346
 Milgram's obedience studies, 29, 31
 Mixed assignment (mixed groups), 268, 271–72
 Mixed factorial designs, 271
 Mixed samples
 two-way ANOVA for, 293–96
 Mode, 174
 Mortality, experimental, 152–53
 Multiple-choice questions, 72
 computer-generated output, 248–56
 Multiple-group designs, 232–57
 assigning participants to groups, 234–35
 comparing, 240–41
 control issues in, 240
 independent variables and, 232–33
 independent *versus* correlated groups, 235
 interpretation of statistics, 247–56
 number of levels in, 233
 placebo effect, 241
 practical considerations, 240–41
 principle of parsimony, 233
 statistical analysis of, 243–47
 treatment groups in, 233–34
 versus two-group designs, 238–40
 variations, 241–42
 Multiple independent variables, 278
 Multiple observers, 65
 Multiple-treatment interference, 162
- N**
- Narrative record, 64
 National Health Research Act (1974), 29
 National Opinion Research Center, 60
 Naturalistic observation, 52, 61–63
 Natural pairs/sets, 212–13, 237, 270
 Nay-sayers, 137
 Nazi experiments, 29–30
 Negative correlation, 66, 228
 Nominal scale, 172
 Nondirectional research hypotheses, 96
 Nonequivalent group design, 323–27
 Nonexperimental research, 49, 59–83
 Non-random assignment to groups, 209–13, 235–38, 268, 269–71
 Nonreactive measures, 149–50
 Nonsystematic sources of research ideas, 16
 Normal distribution, 184–85
 bell curve, 184
 Nuisance variables, 109–11
 Null hypothesis, 192
 Nuremberg Code, 30
 Nuremberg War Tribunal, 30
- O**
- Objectivity, 86–87
 Observational studies
 choosing behaviors and recording techniques, 63–66
 interobserver reliability, 65
 situation sampling, 64
 time sampling, 64
 Observers
 Hawthorne effect and, 62
 interobserver reliability, 65
 as participants, 53
 reactance or reactivity effect of, 62
 Occam's (Ockham's) razor, 204
 One-way ANOVA, 244
 for correlated samples, 253–56
 for independent samples, 248–53
 Online databases
 www.apa.org, 21
 Open coding, 55
 Open-ended questions, 73
 Operational definitions, 101, 244
 Oral presentation, 382–83
 Ordinal scale, 172
 Ordinate (Y axis), 178
- P**
- Parsimony, principle of, 204, 233, 277
 Participant observation, 52
 Participants
 acknowledging, 375
 availability of, 127–28
 characteristics as IVs, 102–3
 characteristics of, 103
 college students as, 163–64
 controlling effects of, 138–39
 cross-cultural sampling procedures and, 143–44
 debriefing of, 37–38
 demand characteristics, 135–36, 138
 experimenter's expectations and, 133–34
 as extraneous variables, 135–39
 generalizability and, 127
 good participant effect, 136–37
 likelihood of success and, 127
 at minimal risk, 36
 number of, 128–29
 as observer, 53
 power of statistical tests and, 129
 precedent and, 127
 responsibilities of, 40–41
 at risk, 36
 types of, 126–28
 types of research project and, 128
 vulnerable populations, 36–37
 white rats as, 162–63
 women as, 164–65
 Participants at minimal risk, 36
 Participants at risk, 36
 Participants subsection, APA format, 343–44
 Participatory action research (PAR), 56–57
 Passive voice, 373–74
 Past research, ideas from, 18–19
 Pearson product–moment correlation coefficient, 191–92
Pedagogical Seminary (Journal of Genetic Psychology), 165
 Perfect positive correlation, 190
 Periodical articles, citations for, 359–60
 Personal interviews, 75–76
 Personality tests or inventories, 79
 Physiological and psychological effects, 134
 Physiological independent variables, 102
 Pie charts, 176–77
 Pilot testing, 71
 Placebo effect, 241
 Plagiarism, 42–43, 356
 Population generalization, 158
 Populations, 79
 Positive correlation, 66, 226
 Poster presentation, 381–82
 Post hoc comparisons, 251, 296
 Posttest-only control-group design, 305–7
 Power, 129
 Practice effect, 148–49
 Precedent, 127
 Precision and clarity in writing, 372
 Presence-absence manipulation, 218

- Presentations, 4, 7–10, 383–84
 Pretest–posttest control group design, 304–5
 Principle of falsifiability, 93
 Principle of parsimony, 204, 233, 277
 Problem definition, 4
 Procedure subsection, APA format, 346–47
 Process, 55
 Professional activities, 379
 oral presentations, 382–83
 poster presentation, 381–82
 presentations, 4, 7–10
 publication, 4, 7–10, 383–84
 student participation in, 379–80
 Programmatic research, 296
Psi Chi Journal of Undergraduate Research, 8, 10, 60
 Psi Chi (National Honor Society in Psychology), 8, 9
 PsychFIRST, 21
 PsychINFO database, 21, 23
Psychology: Health, Happiness, and Success, 61
 Publication, 4, 7–10, 383–84
Publication Manual of the American Psychological Association, 7, 291, 334
 "Publish or perish," pressure to, 44
Psychological Abstracts, 21
- Q**
- Qualitative research, 3, 49–57
 case studies, 54
 characteristics of, 50–51
 data analysis of, 51–52
 ethnographic inquiry, 52–53
 focus groups, 53–54
 grounded theory, 54–56
 methods of, 52–54
 naturalistic observation, 52
 overview, 50
 participant observation, 52
 participatory action research (PAR), 56–57
 Quantitative methods, 64–65
 Quasi-experimental designs, 321–30
 history of, 322
 interrupted time-series design, 327–30
 nonequivalent group design, 323–27
 representative designs, 323–30
 uses of, 322
 Questionnaires, 3, 70–76
 Questions, types of, 72–73
- R**
- Racism, 165–66
 Random assignment, 207–8, 235, 268, 303–4
 Random assignment to groups, 207–9, 268–69
 correlated samples (nonrandom assignment to groups), 235–38
 multiple-groups design and, 235
 Randomization, 113–14
 Random samples, 79
 longitudinal research projects, 82
 single-strata approach, 82
 Response bias, 137–38
 nay-sayers, 137
 response sets, 137–38
 yea-saying, 137
 Response set, 137, 139
 Responsibilities
 of experimenters, 40
 of participants, 40–42
 Results section, APA format, 348–53
 Right to withdraw, 34–35
 Robustness, 223
 Rosenthal effects, 134
 Running head, 334
- S**
- Samples, 79
 Sampling
 populations, 80
 random, without replacement, 80
 random, with replacement, 80
 random samples, 80
 stratified random, 81
 SAT (Scholastic Aptitude Test), 66, 77, 148, 149, 151
 Scales of measurement, 172–73
 interval, 172–73
 nominal, 172
 ordinal, 172
 ratio, 173
 Scientific method
 components of, 86–88
 control, 87–88
 empirical measurements, 86
 objectivity, 86
 replication of findings, 87
 self-correction, 87
 Selection, 151, 304
 interactions with, 153–54
 internal validity and, 151
 Selective coding, 55
 Selective deposits, 61
 Self-correction, 87
 Sensory thresholds, 310
 Sequence or order effects, 121–22
 Serendipity, research ideas from, 16–17
 Sexism, 164–65
 Significance tests
 of findings, 7
 logic of, 196–99
 one-tail *versus* two-tail tests of, 196
 t tests, 193–95, 222–25, 225–28
 Single-blind experiments, 135
 Single-case experimental design, 308–20
 A-B-A-B design, 316–17
 A-B-A design, 315
 A-B design, 314
 baseline measurement, 312
 case-study approach, 309
 changing one variable at a time, 312–13
 experimental analysis of behavior, 310–11
 general procedures for, 311–13
 history of, 310
 repeated measures, 311–12
- Random sampling
 with replacement, 79
 without replacement, 79
 Random selection, 208, 304
 Range, 182
 Rate or frequency, 106
 Ratio scale, 173
 Rats as participants, 162–63
 Reactance/reactivity effect, 62
 Reactive arrangements, 161
 Reactive measures, 149
 Reasoning, types of, 94–95
 Recording techniques, choosing, 63
 References, 26, 342
 citation of, 45–47
 References, 356–62
 Reference section, APA format, 342, 356–62
 Regression to the mean, 150–51
 Reliability, 77, 108
 of dependent variables, 108
 split-half technique, 78
 test–retest procedure and, 78
 Repeated measures, 211–12, 236–37, 269–70, 311–12
 single-case experimental designs and, 311–12
 Repeated-measures ANOVA, 244
 Replication, 18, 87, 168
 Replication with extension, 168
 Reports, 7
 Reprints, 25
 Research
 Research, cross-cultural, 141–45
 Research design, 6. *See also* Experimental design
 Research hypotheses, 91–97
 analytic statements, 92
 characteristics of, 92–95
 contradictory statements, 92
 directional *versus* nondirectional, 96–97
 general implication form, 92–93
 principle of falsifiability, 93–94
 synthetic statements, 92
 Research ideas, 14–19
 characteristics of good, 14–16
 sources of, 16–19
 Research methods, 3
 importance of, 11–12
 Research process, 4–11
 analysis, 6–7
 components of, 4
 deception in, 34, 37–38
 design of, 6
 experiment, conducting, 6
 hypotheses in, 6
 informed consent, 34–36
 interpretation of, 7
 literature reviews, 5
 planning of, 4
 presentations and publication, 7–10
 problem definition, 5
 reporting of, 4, 7
 theories and, 5–6
 Research questions, developing, 19–20
 Research strategies, 81–83
 cohorts, 82
 cross-sectional, 82

Single-case experimental design (*continued*)
 statistical analysis and, 313–14
 uses of, 310–11

Single-strata approach, 82

Situation sampling, 64

Smoothness of expression in writing, 372

Social facilitation theory, 19

Society for Research in Child Development (SRCD), 37

Society for the Experimental Analysis of Behavior, 311

Solomon four-group design, 305

Source tables, 249, 288

Split-half technique, 78

Standard deviation, 183–86

Statements, types of, 92–94

Statistical regression, 150–51, 304

Statistics, 171
 calculating and computing, 181–82
 descriptive. *See* Descriptive statistics
 experimental design and, 220–21
 factorial designs, 283–84
 inferential. *See* Inferential statistics
 interpretation of, 222–28, 247–56, 287–96
 lying with, 45
 multiple-group design analysis, 243–44
 Pearson product–moment correlation coefficient, 191–92
 power and, 129
 significance testing of. *See* significance tests
 single-case experimental design and, 313
 translating into words, 224–25, 227–28, 252–53, 255–56, 289–90, 289–91, 293, 295–96

Stimulus independent variables, 102

Stratified random sampling, 81

Success, likelihood of, 15–16

Sum of squares, 249

Surveys, 3, 70–76
 analytic, 71
 descriptive, 70
 development of, 71–73
 mail, 74–75
 pilot testing of, 71

Synergistic effects, 286

Synthetic statements, 92

T

Tables, 350–51

Telephone interviews, 76

Temporal generalization, 158

Temporal meaning, words with, 374–75

Testability, 14–15

Testing, 148–50, 304

Testing instrument(s) subsection, APA format, 346

Test–retest procedure, 78

Tests, 3, 76–79, 77
 achievement tests, 78–79
 aptitude tests, 79

characteristics of, 77

personality tests or inventories, 79

reliability of, 77–78

significance tests. *See* Significance tests

types of, 78–79

validity, 77

That vs. which, use of, 374

Theoretical considerations, 4

Theories, properties of, 5–6

Theory, research ideas from, 19

Thesaurus of Psychological Index Terms (APA), 21, 22

Thesis statement, 338

Three-way design, 279–81

Time sampling, 64

Title page, APA format, 334

Transactional systems, 55

Transferability, 52

Treatment conditions, 206

Treatment groups, 233

Treatment variability, 285
 in factorial design, 284–85

True experiments, 219

Trustworthiness of data, 51

t tests, 193–95
 for correlated samples, 225–28
 for independent samples, 222–23

Tukey HSD (honestly significance difference), 251

Tuskegee syphilis project, 29, 30

Two-group designs, 204–19
 advantages of, 215–17
 analysis of, 221
 between-groups variability, 215
 calculating statistics, 221
 choosing, 214–15
 comparing, 214–17
 control groups, 206
 control issues with, 215
 control of extraneous variables, 206
 degrees of freedom in, 216–17
 dependent variables and, 204
 error variability, 215
 experimental groups, 206
 independent variables and, 204
 interpretation of statistics, 222–28
 levels or treatment conditions and, 206
versus multiple-group designs, 238–40
 principle of parsimony, 204
 statistical analysis of, 220–21
 statistical issues with, 215
 variations on, 218–19

Two-way ANOVA
 for correlated samples, 291–93
 for independent samples, 287–91
 for mixed samples, 293–96

Type I (alpha) errors, 199, 289

Type II (beta) errors, 199

U

Unbiased language, 343

V

Validity, 77, 108
 concurrent, 77
 content validity, 77
 criterion validity, 77
 of dependent variables, 108
 external. *See* External validity
 internal. *See* Internal validity
 interrater reliability, 77

Variability, 172, 215
 measures of, 182–86

Variables
 dependent variables (DV).
See Dependent variables (DV)
 extraneous variables (confounders).
See Extraneous variables (confounders)
 independent variables (IV).
See Independent variables (IV)
 nature of, 100–101
 nuisance variables. *See* Nuisance variables
 operational definitions of, 101

Variance, 182–83, 250

Vulnerable populations, 36–37

W

Web sites
 scholar.google.com, 21
 www.apa.org, 21
 www.apa.org/psycinfo/psycfirst.html, 21
 www.icpsr.umcih.edu/gss/home.htm, 60
 www.srcd.org/about.html#standards, 37

Which vs. that, use of, 374

White rats as participants, 162–63

Willowbrook hepatitis project, 29, 30

Within-group counterbalancing, 117–19

Within-group variability, 128, 245.
See also Error variability

Within-subject comparison, 212

Within-subject counterbalancing, 117

Women as participants, 164–65

World Wide Web sources, citation for, 361

Writing guidelines, APA format, 371–73
 economy of expression, 372
 grammar, 373–75
 orderly presentation of ideas, 372
 precision and clarity, 372
 smoothness of expression, 372
 strategies to improve writing style, 372–73

Y

Yea-saying, 137, 139

Yes–no questions, 72

Z

Zero correlations, 67, 188