

Index

- α , *see* type I error
- acceptability, 11-12, 105, 106-8
- alternative hypothesis, 69-76 *passim*
- analysis of variance (ANOVA), 129-35
- aspect, 118-21
- association, tests of, 118-23
- average, 9, 10, 27

- β , *see* type II error
- binomial distribution 5, 106

- χ^2 test, *see* chi-square test
- calculator, electronic, 166-7
- central limit theorem, 54, 75
- central tendency, 14; choice of appropriate measure; 32-4; measures of, 27-34;
- chi-square test, 76, 112-23; and phi coefficient, 148-9; and Minitab, 164-5; and SPSS, 160-1
- class interval, 16
- classification; of data, 14-24; of variables 10-13
- coherence, 100-1
- comprehension, 140-5
- computers, 154-65
- confidence limits; for mean, 56-61; for proportions, 61-3
- contingency table, 118-23; and Minitab, 164-5; and SPSS, 160-2
- correlated samples, 75; and significance tests, 88-92, 102-8
- correlation; coefficients, 142-9; interpretation, 149-50; multiple, 137; nature, 137; visual representation, 138-40
- correlational studies, *see* observational studies
- critical value, 58, 60, 71, 74
- critical region, 71

- decile, 36
- degrees of freedom (df); and analysis of variance, 130-4 *passim*; and chi-square test, 113, 117-18, 119-23 *passim*; and estimation using *t* distribution, 59; and *F*-test for homogeneity of variance, 127, 128-9; and Pearson correlation coefficient, 143-4; and phi coefficient, 149; and standard deviation, 59; and *t* test for independent samples, 86
- descriptive statistics, 9-10
- design of investigations, 65-8
- detransformation of sentences, 60
- df, *see* degrees of freedom
- directional test, 72-4; *see also* one-tailed test

- error, types of, in significance testing, 72
- estimate, 9, 53; *see also* interval estimate, point estimate, statistic
- estimation; of population mean, 53-61; of proportion in population, 61-2; of sample sizes, 62-3
- experimental design, *see* design of investigations
- experimental hypothesis, *see* alternative hypothesis
- experimental studies, 65-8

- F* distribution, 127
- F*-test: for homogeneity of variance, 127-9; in analysis of variance, 129-35
- formal/informal English, 106-8
- frequency distribution, 10, 14-24, 39; and Minitab, 162-3; shape, 23-4; and SPSS, 155-7
- frequency polygon, 20-2
- frequency profile, 118

- goodness of fit, 114–18
grouped data, 14–17
- histogram, 18–20; and Minitab, 163
homogeneity of variance, 75, 78, 84; test for, *see F-test*
- hypothesis testing, 10, 68–76; *see also* significance testing
- independence, tests of, 118–23
independent groups design, 68, 137; and significance tests, 78–88, 92–5, 112–23
inferential statistics, 9–10
interquartile deviation, 36
interquartile range, 36
interval estimate, 58
interval variable, 12, 32, 37, 74, 102, 141, 145
- kurtosis, 24
- language test data, 8, 9–10, 11, 14–23
passim, 28, 30–1, 32, 34, 40–1, 49–50, 65–70 *passim*, 73, 81–2, 140–5, 148, 155–6, 159–60, 162–3
- leptokurtic distribution, 24
- level of measurement, 11–13; and choice of significance test, 74–5, 78, 98, 102, 105; and correlation, 141–2; and measures of central tendency, 32; and measures of variability, 37; *see also* interval variable, nominal variable, ordinal variable, ratio variable
- line length in poetry, 29–30, 132–5
- μ (mu), *see* mean
- Mann-Whitney *U*-test, 76, 98–102
- matched subjects design, 67–8, 75, 137
- mean: calculation, 27–9; conditions for suitability, 32–4; estimation for population, 53–61; and Minitab, 162–3, 164; and SPSS, 156–8
- mean deviation, 36
- mean square, 131
- median; calculation, 29–31; conditions for suitability, 31–3; and Minitab, 162–3; and SPSS, 156–7
- Minitab package, 161–5
- mode, 32; and SPSS, 156–7
- model testing, 114–18
- negatively skewed distribution, 23, 33
- nominal variable, 11, 32, 75, 112, 142
- non-directional test, 72–4; *see also* two-tailed test
- non-parametric test, 12, 75, 98–109, 112–23; choice of, 109
- normal distribution, 23, 34, 44–52, 75; testing for normality, 49–50, 114–18
- null hypothesis, 69–76 *passim*
- observational studies, 65–8
- one-tailed test, 59, 72–4; *see also* directional test
- order effects, 67
- ordinal variable, 12, 32, 75, 98, 100, 105, 142, 145–6
- ϕ (phi), *see* phi correlation coefficient
- package programs, 154–65
- parameter, 9, 10, 37, 53
- parametric test, 12, 74–5, 78–95, 127–35
- Pearson product-moment correlation coefficient (*r*), 142, 143–5
- percentile, 36
- phi correlation coefficient, 148–9
- platykurtic distribution, 24
- point estimate, 56
- politeness, 12, 105
- population, 1–9, 10; finite/infinite, 1
- positively skewed distribution, 23, 33–4
- power of a test, 13, 75, 98, 102, 106
- probability theory, 4–6
- proportions, significance of difference between, 92–5
- quartile, 35–6
- ρ (rho), *see* Spearman rank correlation coefficient
- r*, *see* Pearson product-moment correlation coefficient
- random number tables, 2–4
- range, 35; and SPSS, 156–7
- ranking, 11–12, 29, 32–3, 75, 98–105
passim, 108, 142, 145–8
- ratio variable, 12, 32, 37, 74, 141, 145
- reading skill, 146–7
- repeated measures design, 67, 75, 137
- σ (sigma), *see* standard deviation
- s*, *see* standard deviation
- Σ (capital sigma), 28
- sample/sampling, 1–9, 10, 53; block, 3; disproportional stratified random, 7; multi-stage, 7–8; proportional stratified

- random, 6; random, 2, 67, 68; systematic/quasi-random, 3
- sampling distribution; of difference between two means, 79–80; of mean, 53–6; of proportion, 62; of variance ratio, 127
- sampling frame, 2, 8
- scatter diagram, *see* scattergram
- scattergram, 138–40, 142
- sentence; complexity, 11, 134; length, 11, 15–22 *passim*, 33, 35, 36, 121–2, 160–1, 164–5; recall, 86–8, 128–9, 135, 156–9, 163–4
- sign test, 76, 105–8
- significance level, 71–4 *passim*
- significance testing, *see* hypothesis testing
- skewed distribution, 23, 33–4, 36
- Spearman rank correlation coefficient (ρ), 145–8
- SPSS, *see* Statistical Package for the Social Sciences
- standard deviation; calculation, 37–41; and Minitab, 162–3, 164; and SPSS, 156–8
- standard error; of difference between two means, 79, 84–5; of difference between two proportions, 94; of mean, 55–61; of mean difference between pairs of correlated observations, 88–90; of proportion, 61
- standardised normal variable, *see* z-score
- statistic, 9, 10, 37, 53; *see also* estimate, test statistic
- Statistical Package for the Social Sciences, 155–61
- sum of squares, 37; between-groups in analysis of variance, 130–4; within-groups in analysis of variance, 130–4
- syntactic complexity, 53–8, 65–6, 67
- t* distribution, in estimation from small samples, 59–61
- t*-test for correlated samples, 76, 88–92
- t*-test for independent samples, 76, 83–8; and Minitab, 163–4; and SPSS, 156–9
- tense, 61–2, 112, 113, 118–21
- test statistic, 70–6 *passim*
- translation, 103, 140–5, 159–60
- two-tailed test, 59, 72–4; *see also* non-directional test
- type I error (α), 72
- type II error (β), 72
- U*, *see* Mann–Whitney *U*-test
- variability, 14, 34–41
- variable, 10–13; continuous/non-continuous (discrete), 11; dependent/independent, 11, 65–6; subject/situational, 67; *see also* level of measurement
- variance, 37–41; analysis of (ANOVA), *see* analysis of variance; estimate, 84, 131–2; homogeneity of, *see* homogeneity of variance; ratio, 127
- verb; auxiliary, 92–5; finite, 61, 112, 113
- vowel; length, 91–2, 114–18; pronunciation, 122–3
- W*, *see* Wilcoxon signed-ranks test
- Wilcoxon signed-ranks test, 76, 102–5; and SPSS, 159–60
- word length, 11, 66, 82–3
- x* (\bar{x}), *see* mean
- Yates's correction, 122–3
- z-score, 47–9; and estimation, 56–8; and non-parametric tests for large samples, 102, 105, 108; and Pearson correlation coefficient, 143–4; and significance of difference between two means, 80–3; and significance of difference between two proportions, 94–5; and testing for normality, 115–16
- z-test, 78–83