Subject Index

A
accelerated life testing, 331
acceptance region, 289, 294
acceptance sampling, 228, 231
accuracy, 427
alternative hypothesis, 278, 289, 292
two-sided alternative, 292, 365, 366
two-sided alternative, 292, 355
analysis of variance, 214, 400, 402–411, 418–428, 433, 452–473, 492, 494, 495 (see also one way analysis of variance, randomized block experiment, two way analysis of variance)
analysis of variance table, 406, 410, 427, 428, 465, 466, 472, 497
Anderson, Richard B., 15
approximation, see chi-square approximation, Gaussian approximation associated, 98, 187
association, 572, 579–586
average, see mean

B
backward regression analysis, 546
balanced design, 452–454, 475
not balanced, 478
bar chart, graph, 39
Bartlett’s test, 490–494
Bayes’ rule, 188–191, 199
Bernoulli experiment, 219
between-groups mean square, 405, 406, 495
binomial experiment, 197, 214, 220
bivariate normal (Gaussian) distribution, 525, 526, 528
birth rate, 14, 47, 112, 113, 138–144, 513–517
block, see randomized block experiment block mean square, 420, 421
Bonferroni method, 433
for several tests of hypotheses, 400–402
for several confidence intervals, 402, 410, 411, 417, 493, 494
borderline significance, 427 (see also statistical significance)
Box, G. E. P., 4, 231, 469, 473
box graph, 51–53
box plot or box-and-whisker plot, 48–51, 53, 114
Brown, M. B., 495
Brownlee, K. A., 525

C
calorie supply, 14, 34–35, 56, 112, 114, 138–146, 513, 515
case, 6
categorical variable, 6, 7, 572–593
censored observations, 331
Central Limit Theorem, 256–260, 308, 310, 351
central tendency, or center, 4, 49, 53, 72–80, 84, 308–337 (see also mean, median)
Chambers, John M., et al., 138
time, 14, 47, 48–49
classical statistics, 413, 415, 416, 428, 492, 574, 575, 581, 584, 593
distribution, 378, 413, 414
goodness-of-fit test, 572–576, 592
test of association, 572, 579–586
test of homogeneity, 572, 572, 585–586, 593
test of independence, 572, 579–583, 592
child death rate, 11, 44–46
classical statistics, 241, 308, 349, 357, 402, 403, 418–420, 453, 454, 537, 544
Cleveland, William S., 51, 102, 106, 135, 138, 144, 147
Cochran’s rule, 575, 581, 593
coefficient of determination, 548
combination, 215–218, 232
completely randomized design, 453, 454, 473
computer package, see Minitab, Sata
tional probability, see probability confidence interval, 278, 286, 302, 337, 378
for difference between two means, large samples, 352–354
for difference between two means or medians, nonparametric, 368, 369
for difference between two means, t distribution, 362
for difference between two proportions, large samples, 354, 356, 357
for a mean, based on a t distribution, 322
for a mean, large sample, 311–313
for a mean or median, based on a
confidence interval (continued)
Wilcoxon signed rank distribution, 329, 330
for a median, based on a binomial distribution, 354, 355
for multiple comparisons, 410, 411, 417
for a proportion, large sample, 315
for ratio of two variances, 489, 490
for a variance or standard deviation, 486, 487
confidence level, 512, 532, 378
Conover, W. J., 490, 495
contingency table, see frequency table
continuous random variable, see random variable
continuous sample space, see sample space
control group, 355, 364, 397, 398, 403, 487, 573–576
correlation coefficient, 512–533, 540, 541, 549, 551, 552
and simple linear regression, 540–544
cumulative probability, 245

D
Daniel, Cuthbert, 551
data analysis, 2, 3, 10–13, 84, 175, 275, 513, 522 (see also exploratory data analysis)
data list, 28, 53
data set, 2, 6, 13
data value, 6
death rate, 14, 46
deciles, 48
decision rule, 289
degrees of freedom, 317, 326, 406, 413, 414
dependent, 187 (see also associated)
dependent events, 184–187
dependent variable, 106
descriptive statistic, 4, 48, 53, 72, 100, 114, 513, 524, 525, 551
distribution, 43, 53
dot chart, 102–106, 114
dot plot, 31, 53, 114
double-blind experiment, 279, 300, 355, 356, 397
Draper, N. R., 551

E
economic category, 7–9, 98, 100–105, 134–138, 140–144
errors, Type I and Type II, 290, 291
estimation, 3, 277, 278, 533
events, 178, 179
expected value, 195, 196, 199 (see also mean)
experiment, 177
(exsee also paired-sample comparison, two-sample comparisons, single-factor experiments, randomized block experiment, two-factor experiment, factorial experimental design, double-blind experiment)
exploratory data analysis, 5, 12, 34 (see also data analysis)
exploratory studies, 473
extraneous factor, 300–302, 355, 356, 364, 376, 377, 419, 429, 452, 460, 469, 492, 529, 539, 549
extremes, 49, 53, 81, 84
F
F approximation, 495
F distribution, 406, 407
factorial experimental design, 452–454, 473
fair coin, 180
false negative, positive 190
fertility rate, 14, 32–35, 46, 47, 100–104
finite random variable, see random variable
finite sample space, see sample space
Fisher's exact test, 372, 572, 573, 586–593
fixed effects, 453
Forsythe, A. B., 495
fractions on a map, 144–147
Freedman, David, 540–543
frequency plot, 37–39, 53
frequency table, 3, 36–43, 53
multidimensional frequency table, 134–135, 147
two-way frequency table, 97–100, 114, 134
Friedman's test, 400, 428–433 (see also randomized block experiment)

G
Galton, Francis, 543
goodness-of-fit, 572–576, 592
graphs, effective, 146, 147
gross domestic product, 14, 103–105
gross national product, 14, 43, 107–114, 513–523

H
heterogeneous variances, 490
higher education enrollment, 14, 44, 45, 255
histogram, 3, 40–43, 53, 114
Hoaglin, David C., 12
homogeneity of variances, 490
of distributions of a qualitative variable, 372, 572, 581–586, 593
Hunter, J. Stuart, 231, 469, 473
Hunter, William G., 231, 469, 473
hypothesis testing, 3, 278, 289–292, 297, 301, 302, 312
p-value approach, 291, 297
significance level approach, 289, 294, 297

I
independence, 275
chi-square test of independence, 572, 579–583, 592
independent, 98, 187
independent events, 184, 187, 188, 199, 401
independent random variables, 256, 513, 525–533, 552, 579, 592
independent samples, 180
independent variable, 105
infant mortality rate, 14, 321–323
influential observations, 551
interaction effect, 432, 432, 455–460, 464–466, 468, 469, 473, 568
interquantile range, 81, 84, 251
interval estimate, 279 (see also confidence interval)

J
Johnson, Mark E., 490, 495
Johnson, Myrtle M., 490, 495
Joiner, Brian L., 15

K
Kirk, Roger E., 432, 454, 473
Kruskal-Wallis distribution, 413
Kruskal-Wallis test, 400, 402, 411–418, 433

L
large-sample approximation, see chi-square approximation, Gaussian approximation
least squares, 513, 533–540, 544, 552
Lehmann, E. L., 354, 368, 552
level, see significance level
Levene, H., 495
Levene's modified test for variances, 494–498
likely, likelihood, 175, 176 (see also probability)
linear association, see correlation coefficient
linear correlation coefficient, see correlation coefficient
linear models, see regression
list, 28, 53
location, see central tendency
location parameter, 308
logarithm base-10, 109, 384, 385
logarithmic transformation, see transformation

M
map, 144–147
matched-pairs, see paired-sample comparisons
mean, 4, 5, 72–80, 84, 194–196, 199 (see also population mean)
mean square (see also two-way analysis of variance)
between-groups, 405, 406, 495
block, 420, 421
treatment, 420, 421
median, 48, 78, 80, 84, 370 (see also population median)
median test, 349, 369–372, 378
method of least squares, 513, 533–540, 544, 552 (see also regression)
missing value, 11, 478
mode, 46, 53
Mosteller, Frederick, 12
multicollinearity, 550, 551
multidimensional frequency table, 134–135, 147
multimodal, 47
multiple comparisons, 402, 410, 411, 417, 493, 494
multiple regression, see regression
multiple regression coefficient, 548
Myers, Raymond H., 551
N
negatively skewed, 44, 79
nonparametric, 277, 308, 314, 337, 349, 378, 400, 411, 428, 433, 513, 529–533, 552
normal distribution, see Gaussian distribution
not associated, 98, 187
null hypothesis, 278, 289
number of cities of over 500,000 people, 14, 36–39

O
observed significance level, see p-value
odds of an event, 183–184
one-sample t test, 316–323
one-sided alternative, 292, 365, 366
one-way analysis of variance, 400, 402–411, 435, 492, 495
operating characteristic curve, 229–231
order 28, 53 (see also rank)
ordinal qualitative variable, 10
outliers, 354, 389, 520–523, 551

P
paired-sample comparison, 349, 372–377, 400, 418, 453
paired t test, 375
peak, 46, 53
Pearson's correlation coefficient, see correlation coefficient
percentiles, 48
permutation, 214, 215, 232
pie chart, 106
Pisani, Robert, 540, 543
placebo, see control group
point estimate, 277
pooled variance estimate, 359, 404, 492 (see also residual mean square)
population, 3, 12, 13, 276
population growth, 14, 52, 53, 83, 84
population mean
inferences about several, see Friedman's test, Kruskal-Wallis test
one-way analysis of variance, randomized block experiment, two-way analysis of variance
inferences about a single mean, 309–314, 316–330, 336, 337
inferences about two means, 350–354, 357–369, 372–377
population median
inferences about two medians based on a hypergeometric distribution, 369–372, 378 (see also population mean)
inferences based on a binomial distribution, 331–337 (see also population mean)
population size, 15, 76–78, 103–105
population standard deviation, 82 (see also standard deviation)
positively skewed, 44, 78, 79, 406
power, 293, 297–299, 302, 328, 334, 356, 373, 378
practical significance, 296, 297, 354, 427
precision, 427
primary school enrollment, 15, 39–44, 111–113, 57–58
female enrollment, 97–100, 134–136, 158–144
probability, 176–198
conditional, 184–191, 198, 199, 573, 587–589, 591–593
distribution, 194, 214, 232, 275
function, 179–182, 198, 244, 251, 252, 318, 359
model, 180–183, 199, 302, 370
statements, 3, 13, 175, 243, 275, 299
product development, 473
profile, 455, 456, 454, 465, 468, 568
proportion
large-sample inferences about a single proportion, 308, 314–316, 334, 336, 337, 576, 592
large-sample inferences about two proportions, 349, 354–357, 577, 585, 586, 593
small-sample inferences about a single proportion, 572, 576–578, 592
protocol, 455
Purves, Roger, 540–543
p-value, 281, 284, 288, 291, 295, 296, 302
Q
quadratic relationship, 524, 570
qualitative variable, 6, 7, 10, 572–593
quality control, 228–232, 324, 427, 473, 484
quantiles, 48–53, 72
quantitative variable, 6
quartiles, 48–53, 81
R
R², 540
random assignment, 355, 364, 365, 377, 418, 453, 591
random effects, 453, 454
random sample, 234, 300
random sample (continued)
in the experimental sense, 277
in the probability sense, 256–276
random selection, 177 (see also random sample)
random variable, 191–199, 244, 256
continuous random variable, 192–194
finite random variable, 191–194
randomized block experiment, 400, 418–433, 453, 454
range, 4, 81, 84
range frame, 105, 107, 114
rank correlation coefficient, 513, 529–533, 552
Rawlings, John O., 551
regression, 241, 533–540, 544–551, 552
toward the mean, 513, 543
rejection region, 289, 294
replication, 432, 453
representative sample, 3, 277, 300, 301
residual mean square, 405, 406, 420, 421, 423, 457, 492, 495, 557
residual plots, 424, 425, 433, 461–463, 469–472, 538, 539, 549, 550, 551
Rice, John A., 318, 401
robust, 321, 361, 408, 424, 494–498
round-off error, 465, 516
Ryan, Barbara F., 15
Ryan, Thomas A., Jr., 15

S
sample, 3, 12, 13, 276
representative, 3, 277, 300, 301
sample mean or average, 72 (see also mean)
sample standard deviation, 82 (see also standard deviation)
sample size, 297, 302, 308
sample space, 177–179, 198, 199
continuous sample space, 177–179
finite sample space, 177–178
sampling and decision rule, 229–231
scattergram, see scatterplot
scatterplot, 105–114, 135–138, 147
scatterplot matrix, 138–144, 147, 549, 551
Schaefer, Robert L., 15
Schilling, Edward G., 231
sensitivity, 189
sign test, 331–337
significance level, 280, 286, 289, 290, 294, 295, 302, 401
simple linear regression, see regression
single-factor experiments, 400–418, 433, 452, 453
skew
to the left, 44, 79
to the right, 44, 78, 79, 406
skewness, 53 (see also skew)
Smith, H., 551
sort, 28 (see also rank)
Spearman’s correlation coefficient, 513, 529–533, 552
specificity, 189
spread, see variation
standard deviation, 81–84, 194–197, 199
standard deviation (SD) line, 540–544, 552
standard error, 259, 285, 351, 380
standardized data value, 254, 255, 515
standardized random variable, 248, 516
Stata, 466, 472
statistic, 2
statistical inference, 2, 3, 12, 13, 175–177, 191, 199, 241, 275–277, 299, 349
statistical process control, 232
statistical significance, 296, 354, 427 (see also practical significance, borderline significance)
statistical software package, 12, 13 (see also Minibab, Stata)
statistics, 2
stem-and-leaf plot, 31–36, 53
straight line, see regression
survey, opinion, 579–583
symmetric, symmetry, 43, 53, 80

T
t distribution, 308, 316–323, 336, 349, 355–363, 410, 431
t test, 241, 308, 336, 494
one-sample t test, 316–323
paired t test, 375
two-sample t test, 241, 249, 357–363, 377, 378, 402, 408
tail probability, 245
tolerance range, 324, 487
test statistic, 289, 290, 294, 295
total fertility rate, see fertility rate
total gross domestic product, 14, 105–109
treatment mean square, 420, 421
trimmed mean, 76–78, 84
Tukey, Edward R., 106, 146, 147
Tukey, John W., 12, 54, 49, 51, 405
two-factor experiment, 452–473, 568
with each factor at two levels, 466–473
two-sample comparisons, 349–372, 376, 377, 400, 433 (see also median test, t test, Wilcoxon-Mann-Whitney test)
two-sample t test, see t test
two-sided alternative, 291, 355
two-way analysis of variance, 432, 454–473
two-way frequency table, 97–100, 114, 134
Type I and Type II errors, 290, 291

U
unassociated, 98, 187
unbalanced design, 478
unimodal, 46
unit of measurement, 10

V
variable, 6
ordinal qualitative, 10
qualitative, 6, 7, 10, 572–593
quantitative, 6
random, 191–199, 244, 256
variance, 194–197, 199
parametric inferences about more than two variances, 490–494
parametric inferences about a single variance, 484–487
parametric inferences about two variances, 487–490
robust inferences about two or more variances, 494–498
variance ratio distribution, 406, 407
variance ratio test, 487
variance-stabilizing transformation, 385
variation, 4, 5, 49, 53, 80–84, 484–498
Velleman, Paul F., 12

W
weighted mean, 74–76, 84
Wilcoxon-Mann-Whitney distribution, 439, 477
Wilcoxon-Mann-Whitney test, 363–369, 378, 402
Wilcoxon signed rank distribution, 308, 323–330, 357
Wilcoxon signed rank test, 324–328, 335–337
within-groups mean square, see residual mean square
Wood, Fred S., 551
Source Index to Referenced Examples and Exercises

A
Allman, Kahneman and Tversky: risk assessment in situations involving uncertainty 197-198
American Council on Education: bachelor's degrees by race/ethnic group and sex 127, 128
American Council on Education: degrees awarded by type, sex, and year 162
American Council on Education: high school completion and college entrance by sex and race/ethnic group 162
American Council on Education: minority enrollment, teachers and new hires for several states with high minority enrollments 152, 153
American Council on Education: numbers of doctoral degrees by race/ethnic group 59

B
Beck, Felsen, and Glickman: rabies and animal species, for three years 164, 165
Berger, Boos, and Guess; Yu, et al: lifetimes of rats on two diets 386
Berry; pre- and post-treatment measurements of premature ventricular contractions 389
Berry; premature ventricular contractions in 12 volunteers on each of three drugs 449
Berry; resistance with five types of electrodes on arms of volunteers 447
Berry and Berry: field-goal ratio and point-after-touchdown ratio for NFL kickers 122
Blackshaw and Diggie; Andrews and Herzberg; studies of earthworm populations 445, 496
Bonney; Fienberg; Sewell and Shah; college plans and parental encouragement in male and female high school seniors 599
Bonney; Morrison, et al: appearance of tumor and survival in breast cancer patients 600
Boston Globe: one day's odds and point line for three Boston sports teams 203
Boston Globe: yearly costs per Red Sox minor league player 120

Boston Sunday Globe: district scores in reading, mathematics and science for third graders in 27 Massachusetts communities 172
Boston Sunday Globe: percentage of dwellings units with lead paint in 23 towns 70
Box, Hunter, and Hunter; Drew: bacteria in bath water, two-factor experiments 480
Box, Hunter, and Hunter; Elliott, Navarro, and Nomof: change in pupil diameter after morphine and nalbuphine 388, 503
Box, Hunter, and Hunter; McNeath and Cohen: specific airway resistance for two methods of administering a bronchodilating aerosol 385, 386, 504
Box, Hunter, and Hunter: productivity of technicians on different machines 482
Box, Hunter, and Hunter: U.S. Patent 3,505,079: comparison of two cake mixes 342
Box, Hunter, and Hunter: yield using four methods of manufacturing penicillin 446
Breslow; J. Nat. Cancer Inst.: survival of control mice and mice exposed to urethane and several doses of DDT 150
Brogan and Kuner; Annals of Surgery: before and after surgery maximal urea synthesis in cirrhotic patients undergoing two different operations 387
Brown; Varmo and Chilton; Zinner, Duany and Chilton: crossover dental study 606
Buechler, et al: self-reported cigarette smoking in physicians by specialty and year 166

C
Carroll, Andrews and Herzberg: preferences for two products 395, 396
Carroll, Sacks and Spiegelman: instrument response for copper in spectroscopy 507, 565
Carter and Blight: length of fertile period in a sample of women 70
Carter; Lane: sucrase activity determined two ways 609
Cederlund, Camner, and Svartengren: studies of nasal clearance times 393, 394
Chance; Weiss, et al; Barnes: information on testing for AIDS 189–191
Cheng; Cooper: stress loads at fracture for graphite beams 61, 62
Chinchilli, Schwab and Sen; Barr: study of four formulations of the drug verapamil 617–618
Cloninger: men classified by genetics, environment, and two types of alcoholism 153, 164
Cosgrove: radiocarbon dates and depth of samples for two archeological digs 153, 154
Cramer, et al: information on tubal infertility and method of contraception 314, 573
Crouchley and Fieldes: sex of children by birth order in families of 2–5 children 618–619

D
DeHaven and Lintner: sports injuries classified by sex and site of injury 129, 130
Deem, Oliver, and Beachy: genetic study of tobacco mosaic virus 596
Devore; Amer J Clinical Nutr.: two methods of measuring breast milk intake 526
Devore; Amer J Nutrition: alanine levels in baby boys on iso-leucine-free diet 94
Devore; ASCE Transportation Eng J.: distances from cyclists to center line and cars 534
Devore; British J Preventive and Social Medicine: time of onset of labor in pregnant women 597
Devore; Environ Research: pulmonary compliance in workers exposed to asbestos 93
Devore; Environmental Science and Technology: carbon monoxide and benzo(a)pyrene measurements in New York City 124, 557
Devore; Heredity: genetic study of the cereal crop sorghum 597
Devore; Home Econ Research J.: smoothness of nine fabric types dried five ways 444, 445
Devore; J Applied Physiology: nitrogen expired by people on four diets 441
Devore; J Environmental Health: bacteria in carpeted and uncarpeted hospital rooms 124
Devore; J Environmental Health: radiation levels in television display areas 94
Devore; J Illuminating Eng: task performance at two light levels 560
Devore; Psychosomatic Med: skin potential in volunteers for four emotions 442
Devore; Science: leaf protein in six soybean plants 93
Devore; Technometrics: rainfall from seeded clouds 64
Devore; Textile Research: thickness and stiffness of fabric samples 530
Devore; Trans Royal Canadian Institute: genetic study of tomatoes 596, 597
Dhindsa; Metcalfe, and Hummels; Hohimer, et al: exercise and birth weights in goats 316, 323, 502
Dick, et al: study of modes of transmission of common cold viruses 590
Dienstfrey: exposure to combat among women veterans 200
Dierz; McIntee and Mair: HVA, IQ, MQ for patients with Korsakoff's psychosis 158
Draper and Smith: steam use and average temperature at a factory 560, 561
Duncan: Bendix Aviation Corporation: defects in pieces of wool cloth 67
Duncan; Gore: strength of polymer sheet castings, two-factor experiments 467, 479, 510
Duncan; Grant and Leavenerworth: drained weights of tomatoes 345, 357, 484
Duncan; Kaufman: percentages of fuel tanks with leaks 65, 66
Duncan; shear strengths of welds 65
Duncan; shear strengths of welds of stainless steel 63, 64
Duncan; U.S. Department of Agriculture: strength of yarn samples 62
Duncan; Wernimont: melting point determinations 383, 418, 505
Dunnett: tumor growth in treated and control mice 364

E
Efron and Tibshirani: average LSAT and undergraduate grades for 15 law schools 123
Ellenberg; Mickey, Dunn, and Clark: two characteristics of children with heart disease 611
Elliot; Byar; Andrews and Herzberg: calcium concentrations in men with and without calcium oxalate crystals 395
Farquhar and associates; Hollander and Proschan: obesity and blood pressure in Mexican-American men and women 157
Foster: height of tomato plants receiving water at three levels of pH 449
Freedman, Pisani and Purves; Francis: polio field trials 397, 398

G
Gallant; Gallant and Fuller; Epwright, et al: age and weight/height of preschool boys 614
Gallant; Hsiung: study of specific volume in polymers 613
Gart and Tarone; Gart: skin tumors and survival of mice in a tobacco study 600, 601
Gasper; ICI Resins US, ICI Americas, Inc.: optical density of polymer latex, two-factor experiment 477, 509
Gastwirth: probabilities in use of the lie detector or polygraph test 205
Geertsema and Reinecke: tyrosine measurements in mentally handicapped patients 267, 268, 608–609
Gould: arthritis patient response, two treatments 611–612
Granatek, et al: antibody response and survival in leukemia patients 598
Grant: malnutrition, access to water, polio inoculation, low birth weight, and percentage of mothers breastfeeding for 29 countries 167
Grant: percentage of mothers breastfeeding for 29 countries 270
Grant: United Nations rankings of 40 countries by under-5 child mortality, plus life expectancy, percent of newborns with low birth weights, and calorie supply 15–26, 53–59, 172, 173
Grayson; Goldberg, et al: study of minor psychiatric disorders in patients 690
Gross and Lam; Gross and Clark: headache relief, two treatments 611

H

Haberman: survey results for men of different education levels 617
Hatton and Clarke-Hundleby: deaths in Western Australia, by sex and cause of death 132
Hatton and Clarke-Hundleby: numbers of cancers in Western Australia by site and sex 69
Haugh, et al: cigarette smoking among Vermont 4th and 5th graders 199
Higgins and Koch: survey of hyssinosis complaints in cotton textile workers 387
Hocking: volume rise of dough made from three flour types 442
Hoffman, et al: study of antibodies associated with malaria 391
Hojnacki: plasma estrogen levels in alcohol-consuming and control monkeys 383, 384, 487
Hojnacki: plasma testosterone levels in alcohol-consuming and control monkeys 384, 504, 505
Hollander and Proschan; Karelitz, et al: cry count and IQ score for girls and boys 156
Hollander and Proschan; Proschan: times to failure for air-conditioning equipment 92
Hollander and Wolfe; Cole and Katz: oxidant content of dew water samples 92
Hollander and Wolfe; Cooper, et al: hypnotic susceptibility before and after training 390, 391
Hollander and Wolfe; Fox and Randall: forearm tremor frequency with wrist weights 152
Hollander and Wolfe; Jung and Parekh: comparison of two methods of determining serum iron concentration 388
Hollander and Wolfe; Jung and Parekh: serum iron determinations of control sera 344, 503
Hollander and Wolfe; Hundal: performance in repetitive work with differing feedback 448
Hollander and Wolfe; Shelp, et al: insulin clearance in kidney donors and recipients 559
Hollander and Wolfe; Siddiqui and Ghan: survival times for leukemia patients 63
Hollander and Wolfe; Thomas and Simmons: spumon histamine levels in allergic and nonallergic smokers 385, 504
Hollander and Wolfe; Woodward: comparison of three methods of rounding first base 443
Hsieh, Bain: times to failure for tires from three production methods 121, 122
Hui and Rosenberg; Barash, et al: comparison of cardiovascular performance in children before and under two anesthetics 391, 392

I

Ingebretsen, Sherrod and Mariner: discharge temperature and element concentrations for eight hot springs 154
Ismail, et al: schistosomiasis infection by type, occupation, age, and sex in Egyptian village 165, 166

J

James and Conyers: accumulation of pyruvate over time in rats 614
James and Knuiman: average shower flow rate, domestic water use in Perth 60
James and Knuiman: average toilet flush volumes, domestic water use in Perth 60
Jensen; Andrews and Herzberg; Andersen, Jensen, and Schou: plasma citrate concentrations before breakfast in ten volunteers 342, 503
Johnson; Li: cross-sections of cakes, different recipes and baking temperatures 605
Jones; Hill and Padmanabhan; Bishop: body weight and kidney weight in normal and diabetic mice 151

K

Kanki, et al: presence of HIV (AIDS virus) in three risk groups in African countries 161
Kauffman; Duncan; Hollander and Proschan: heights of bomb bases 324, 502
Knuiman and Speed: duration of diabetes and presence of retinopathy 121
Knuiman and Speed: obesity and hypertension 599
Koch, et al: age and response of arthritis patients, two treatments 620–621
Kolata: comparison of penicillin and placebo in zidovudine disease 601

L

Lee and Krutchkoff: mercury concentration in 115 swordfish 260
Leung and Kupper; Walter: serum cholesterol and subsequent heart disease 612
Lownd: self-versus rival-competition in base-running 373

M

Macou: yield comparison for microwaved and unmicrowaved oranges 369, 370
Mahon, Andrews and Herzberg; O'Sullivan and Mahan: fasting blood sugar levels in 52 pregnant women 343
Marty, McDermott, and Williams: smokeless tobacco use by Arkansas high school students 130
Mather and Rottberg: study of protective markings of snowberry fly 128
McMahan: serum total cholesterol in 23 baboons 266, 267
Mehta, Patel, and Tisias: change in arthritis patient condition, two treatments 610
Meier, Francis, et al: results of polio field trials 356
Meier; Lanman, et al: survival and blindness in premature babies, two oxygen levels 612–613
Mendenhall and Sincich; Wang: pressure, angle, and recovery in crude oil extraction 568
Mendenhall and Sincich; Woelfl, et al: permeability of formulations of concrete 506, 569
Millar and Stephens: comparison of body weights in Britain, Canada, and U.S. 583–586, 602
Milton and Arnold: Civil Engineering: errors made with handheld laser range finder 66
Milton and Arnold; Design News: times to reprogram a byte of memory on a chip 93
Milton and Arnold; Emerson: readability of published and unpublished reports 124
Milton and Arnold; Energy and Technology Review: life of aluminum air batteries 66, 67
Milton and Arnold; Hegland: errors made by a robot in applying adhesive 92
Milton and Arnold; Kiss: results from x-ray microanalysis for potassium in samples 66
Milton and Arnold; NASA Tech Briefs: wind speed from ground and satellite 559
Milton and Arnold; Roberts: sulfur dioxide concentrations in a damaged forest 65
Milton and Arnold; Waltman: light intensity of highway signs 64
Moran; Andrews and Herzberg; Collman and Stoller: age of mother and Down's syndrome in babies 131
Myers; Burkham, et al: characteristics of stands of pine trees 542, 545
Myers; Navy Manpower and Material Analysis Center: items processed and man-hours spent at 22 naval installations 562

N
Nair; Nelson: survival times of insulating fluid at two voltage levels 636
Nascl; Harris and Porter: mosquitoes captured by electrocuting device and human bait 161, 381, 382
Nascl; Harris and Porter: mosquitoes counts with yards with three different devices 440
National Weather Service Operations Manual; Bocchieri; Seitter: probability in weather forecast 176
Nelson: lifetimes of electric cords in accelerated life testing 331
Nelson: lifetimes of electric motor insulation at different temperatures 506, 565
Nelson: temperature rise in spools (for electric motors) made from two types of plastic 390
Nelson: two measurements of temperature rise on each of 12 plastic spools for motors 123, 561
Nordheim; Tsiatis, and Shapaz: response of male beetles to different doses of airborne sex pheromone 131, 132, 598, 599

O
O'Brien and Fleming; Woolson and Lachenbruch; Batchelor and Hackett: survival times of closedly and poorly matched skin grafts for 11 burn patients 390
Oja and Nyblom; Johnson and Wichern: sodium, potassium in perspiration of women 125, 557
Olsen: results of a coin-toss experiment by 50 college students 272
Owen and DeRouen: chlorine determinations at an industrial site 610–611

P
Partridge, Johnston, and Edwards: recovery milestones over time for stroke patients 159
Patrascu, et al: stimulation index for men in four treatment groups in malaria study 441, 508
Perry; Andrews and Herzberg: study of serum markers for muscular dystrophy 545
Piegorsch, Weinberg and Margolin; Basham, et al: study of synergism of interferon and monoclonal antibody for survival in mice with lymphoma 150, 151
Pitetti, et al: effects of exercise on individuals with amputation of a lower limb 622–623
Pollock, Winterstein, and Conroy: characteristics of black ducks, two age groups 154, 155
Porter and Moore: tests of ability to recognize family members with sense of smell 346, 347
Prentice; Bliss: survival of beetles at different doses of gaseous carbon disulfide 607
Quade; Carrwright, Lindahl, and Baxden: characteristics of girls on different dental treatments 621–622
Quesenberry, Whitaker, and Dickens; Walkling; Bleffert, and Kiernan: aflatoxin levels in peanuts 267, 395, 607

R
Ramsay; Consumer Reports: engine displacement, gas usage, weight for small cars 153
Ratkowsky; Andrews and Herzberg; Ratkowsky and Martin: apple yield with several nitrogen supplement, plus control group 403
Rice; Perry, Van Dyke, and Theye: plasma epinephrine concentrations in dogs on each of three anesthetics 429
Rice; Box, Hunter, and Hunter; Box and Cox: survival in a poison/treatment study 481
Rice; Brownlee: car velocity and stopping distance 566
Rice; Campbell, and Peletier: niacin determinations, two-factor experiments 454, 478
Rice; Natrelle: lifetimes of three types of stopwatch 443, 507
Rice: retention of iron in mice; two-factor experiment 479, 508
Rice; Ryan, Joiner, and Ryan: stream depths and flow rates 567
Rice: study of aggressive behavior in three species of mice 446, 447
Rice; Weindling: height, weight, catheter length in children undergoing heart surgery 563, 564
Rosenstock; Stegachis and Heaney: opinion survey regarding a smoking ban 579
Ryan, Joiner, and Ryan: lengths of stay for voluntarily committed psychiatric patients 69
Ryan, Joiner, and Ryan: number of full-time employees in a sample of restaurants 68

S
Scheier, Ray, and Hare; Hahn, Haber, and Fuller: aggressive behavior of mice with different brain weights, two environments 609–610
Schmoyer; Garofalo, et al: rupture times of steel at different stress levels 490, 502, 566, 567
Science: HTLV-I antibodies in people with and without tropical spastic paraparesis 128
Science: science career interest in academically prepared high school males and females 129
Science: susceptibility of adults and children to malaria infection 165
Science News: antibody response to possible vaccine for AIDS 622
Science News: lifetimes of livers treated with an experimental solution 344
Source Index

Science News: multicenter comparison of treatments for cardiac arrhythmia 382, 598
Science News: relationship between coronary artery disease and depression 344, 601
Science News: relationship between a heart defect and the bends in scuba divers 343, 602
Science News: study of chronic fatigue syndrome and Epstein-Barr virus 601–602
Science News: study of growth hormone gene transfer between types of fish 347
Science News: study of nitrous oxide and infertility 602
Science News: study of relationship between abnormal liver function and obesity 129
Science News: study of treatment for ulcerative colitis 347
Science News: test of an antibody as possible early warning of diabetes 127
Shapiro, Brain, and Shapiro: lifetimes of 35 motors 345
Shaughnessy: distances hit for two types of bat and two brands of softball 94, 95, 476, 509, 510
Short and Wasserman: probabilities relating to Joe DiMaggio’s batting career 211
Snee, Ott and Snee: fill weights of bottles, six positions and five times 619
Snow: comparison of two ammunitions in target shooting 382, 383, 505
Statistical Science: Haseman and Huff: carcinogenicity studies in rats and mice 127

T
Tanner and Wong, Haber: answers to survey questions on abortion 162, 163
Tanner and Gatt: tolazamide carcinogenicity study in mice and rats 615
The Sporting News, USA Today: Lee Panas: hits allowed in 1987 by major-league baseball teams 250
Tursz and Crost: sports injuries in French children by sex, age, and type of injury 164

U
Urguhart: weights of cattle on different diets 620
U.S. Commission on Civil Rights; Fienberg, Andrews and Herzberg: information on racial composition, fires and thefts, age of housing, and homeowners insurance availability by Chicago zip code area 169-171
USA Today, Alan Guttmacher Institute: pregnancy rates for 15-19 year-olds by state 63
USA Today: average drive and 1986 earnings for 19 top male golfers 269
USA Today: baseball statistics for 26 major-league teams, 1987 season 168, 169
USA Today: cost of 46 selective U.S. universities 68
USA Today: Council of State Government: base pay of state governors 67
USA Today: National Climatic Data Center: record cold temperatures by state 61

V
Van Ryzin and Rai; Carlborg: bladder tumors in rats fed different doses of saccharin 120, 121

W
Wallach and Goffinet; Young and Corbet: weight and energy requirements in sheep 158, 159
Walpole and Myers: body and heart weights in woodchucks 558
Walpole and Myers: comparison of two methods of catching grasshoppers 557, 558
Walpole and Myers: physical characteristics and ability in American football punters 562, 563
Walsh: exercise bicycle experiment 262, 283
Weinberg and Gladen, Baird and Wilcox: cycles to pregnancy for smokers and nonsmokers 126
Wickelgren: diagnostic test for AIDS in newborns 616
Wilmore: age, height, weight, maximal oxygen capacity for male world-class runners 160
Wilmore: maximal oxygen uptake for female world-class athletes in four sports 125, 126
Wilmore: maximal oxygen uptake for male and female athletes in four sports 160
Wilmore: maximal oxygen uptake for male world-class athletes in five sports 125
Wilmore: maximal oxygen uptake for male world-class athletes in three sports 412
Willkin, et al: study of sex chromosome genotypes and criminal behavior in Danish men 577, 587
World Bank: contraception use for 28 low-income countries 91
World Bank: indicators of social and economic development for 128 countries 5-15, 29-55, 72-84, 97-114, 134-146, 514
World Bank: population and life expectancy for 19 industrial market countries 89
World Bank: population and life expectancy for 35 low-income nations 90

Y
Yamamoto, et al: domestic cats classified by sex and presence of feline immunodeficiency virus 129

Z
Zerbe: plasma inorganic phosphate levels in obese and control patients 267, 615-616