### Subject index

**A**
- adding commands/programs............. 33
- adjust for multiple comparisons....126–129
  - experimentwise error rate........126
  - familywise error rate.............126
  - Scheffé.........................126–127
  - Tukey's HSD....................126–129
- **anova** command..................119
  - factorial ANOVA.................144–146, 159–160
  - one-way ANOVA..................119

**B**
- benefits of Stata..................4–5
- **bootstrap** command..............342
  - computing the confidence interval........... 343
- by processing........................18
- **bysort** prefix...................268

**C**
- categorical predictors............77–86
  - dummy coding....................78–86
  - changing the base category....84
  - factor variables...............83–84
- **generate** and **replace**
  - commands.......................79
- **generate** command only....80
- interpretation of coefficients....81–83
  - null hypothesis...............83
  - rules.........................78
- **tabulate** command..............80
  - using with **regress** command..81
- incorrect implementation........78
- cd command........................12
- conditional variance.............53
  - formula........................53
  - root mean squared error........53
- confidence intervals.............58
  - coverage rate.................59–60
  - formula........................58
  - interpretation...............59–60
- confirmatory factor analysis...377–396
  - $\chi^2$-difference test........346–349
- causal models....................321
  - computing reliability ($\omega$)....340
  - connection to regression......323
  - correlated residuals..........350
  - reliability....................353
- estimating in Stata..............see **sem** command
  - global fit....................392–396
  - goodness of fit...............328
  - $\chi^2$ test................330–334
  - $\chi^2$...................392–393
  - CFI.............................394
  - printing in Stata..............see **estat**
  - **gof** command
  - RMSEA..........................393
  - SRMR...........................394–395
  - TLI..............................394
  - identification...............383, 401–402
  - constraints..................384–386
  - just-identified..............386
  - overidentified...............386
  - underidentified...............386
  - intercepts....................400
  - introduction..................320
  - latent variables.............321
  - mean structure..............381, 383
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>confirmatory factor analysis, continued</td>
<td>323, 382</td>
</tr>
<tr>
<td>model-implied covariance</td>
<td>323, 382</td>
</tr>
<tr>
<td>nested models</td>
<td>346</td>
</tr>
<tr>
<td>parallel items</td>
<td>349</td>
</tr>
<tr>
<td>path model</td>
<td>321</td>
</tr>
<tr>
<td>parts</td>
<td>321</td>
</tr>
<tr>
<td>predicted covariance matrix ($\hat{\Sigma}$)</td>
<td>326, 329, 334</td>
</tr>
<tr>
<td>prediction equation</td>
<td>323–326</td>
</tr>
<tr>
<td>$R^2$ for an item</td>
<td>335</td>
</tr>
<tr>
<td>estimating in Stata... see estat eegof command</td>
<td></td>
</tr>
<tr>
<td>formula</td>
<td>335</td>
</tr>
<tr>
<td>reliability</td>
<td>343</td>
</tr>
<tr>
<td>$\omega$ versus $\alpha$</td>
<td>343</td>
</tr>
<tr>
<td>impact of weak loadings</td>
<td>343</td>
</tr>
<tr>
<td>internal consistency</td>
<td>343</td>
</tr>
<tr>
<td>tau-equivalence</td>
<td>344</td>
</tr>
<tr>
<td>sample versus asymptotic variance</td>
<td>336</td>
</tr>
<tr>
<td>saturated model</td>
<td>331</td>
</tr>
<tr>
<td>shared variance across all items</td>
<td></td>
</tr>
<tr>
<td>shared variance across all items</td>
<td>338</td>
</tr>
<tr>
<td>standardized solution</td>
<td>389</td>
</tr>
<tr>
<td>tau-equivalent models</td>
<td>346</td>
</tr>
<tr>
<td>unstructured model</td>
<td>321</td>
</tr>
<tr>
<td>variance of an item</td>
<td>382</td>
</tr>
<tr>
<td>variance structure</td>
<td>381</td>
</tr>
<tr>
<td>versus exploratory factor analysis</td>
<td>377</td>
</tr>
<tr>
<td>contrast command</td>
<td></td>
</tr>
<tr>
<td>factorial ANOVA</td>
<td>147–149, 164–165</td>
</tr>
<tr>
<td>mcompare() option</td>
<td>148, 165</td>
</tr>
<tr>
<td>nowald option</td>
<td>165</td>
</tr>
<tr>
<td>pveffects option</td>
<td>165</td>
</tr>
<tr>
<td>repeated measures</td>
<td>176, 196</td>
</tr>
<tr>
<td>small option</td>
<td>176, 196</td>
</tr>
<tr>
<td>small samples</td>
<td>190</td>
</tr>
<tr>
<td>corr command</td>
<td>322, 359</td>
</tr>
<tr>
<td>covariance option</td>
<td>329</td>
</tr>
<tr>
<td>cumulative normal distribution function ($\Phi$)</td>
<td>211</td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Data Editor</td>
<td>15</td>
</tr>
<tr>
<td>describe command</td>
<td>14</td>
</tr>
<tr>
<td>do-files</td>
<td></td>
</tr>
<tr>
<td>see reproducible analysis</td>
<td></td>
</tr>
<tr>
<td>dummy coding</td>
<td></td>
</tr>
<tr>
<td>see categorical predictors, dummy coding</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Early Childhood Longitudinal Program data</td>
<td>398</td>
</tr>
<tr>
<td>effect size</td>
<td></td>
</tr>
<tr>
<td>$\eta^2$</td>
<td>149–150</td>
</tr>
<tr>
<td>$\omega^2$</td>
<td>150–151</td>
</tr>
<tr>
<td>$f$</td>
<td>223</td>
</tr>
<tr>
<td>Cohen's $d$</td>
<td>116</td>
</tr>
<tr>
<td>versus Hedges's $g$</td>
<td>116</td>
</tr>
<tr>
<td>estimating in Stata... see esize command</td>
<td></td>
</tr>
<tr>
<td>factorial ANOVA</td>
<td>149–151, 165</td>
</tr>
<tr>
<td>partial-$\eta^2$</td>
<td>149</td>
</tr>
<tr>
<td>partial-$\omega^2$</td>
<td>150</td>
</tr>
<tr>
<td>egen command</td>
<td>17</td>
</tr>
<tr>
<td>mean() option</td>
<td>252, 268</td>
</tr>
<tr>
<td>tag option</td>
<td>268</td>
</tr>
<tr>
<td>egenmore command</td>
<td></td>
</tr>
<tr>
<td>semean option</td>
<td>252</td>
</tr>
<tr>
<td>esize command</td>
<td>116</td>
</tr>
<tr>
<td>esize twosample command</td>
<td>116</td>
</tr>
<tr>
<td>estat bootstrap command</td>
<td>343</td>
</tr>
<tr>
<td>estat icc</td>
<td>250</td>
</tr>
<tr>
<td>estat esize command</td>
<td>335</td>
</tr>
<tr>
<td>factorial ANOVA</td>
<td>150–151</td>
</tr>
<tr>
<td>omega option</td>
<td>151</td>
</tr>
<tr>
<td>estat framework command</td>
<td></td>
</tr>
<tr>
<td>fitted option</td>
<td>329, 334, 383</td>
</tr>
<tr>
<td>estat gof command</td>
<td>330, 391, 392</td>
</tr>
<tr>
<td>estat ic command</td>
<td></td>
</tr>
<tr>
<td>following mixed</td>
<td>179</td>
</tr>
<tr>
<td>estat icc command</td>
<td>250</td>
</tr>
<tr>
<td>estat wcorrelation command</td>
<td>178, 182, 184, 187, 196</td>
</tr>
<tr>
<td>estimates store command</td>
<td>348</td>
</tr>
<tr>
<td>exploratory factor analysis</td>
<td>358–377</td>
</tr>
<tr>
<td>common factor model</td>
<td>359</td>
</tr>
<tr>
<td>communality</td>
<td>364</td>
</tr>
</tbody>
</table>
exploratory factor analysis, continued
  data reduction .................. 359
  eigenvalues .................. 363
  equation .................. 360
  estimating in Stata .... see factor command
  extracting factors ........ 360
  choosing the number ........ 366
  eigenvalues-greater-than-one rule ........ 366
  scree plot ........ 367
  extraction methods ........ 360
  principal-component factor .................. 360
  interpreting loadings .................. 362
  notation .................. 360
  orthogonal factors .................. 362
  parallel analysis .................. 368
  promax rotation .................. 374
  rotation
    estat common command ........ 376
    estat structure command .................. 376
    rotate command ........ 372, 374
  simple structure .................. 370
  uniqueness .................. 364
  varimax rotation .................. 370
  versus confirmatory factor analysis .................. 358
  versus principal-component analysis .................. 365
  extending syntax over multiple lines ........ 25

factorial ANOVA
  benefits .................. 131
  degrees of freedom ........ 142–143
  effect size ........ see effect size
  estimating in Stata .... see anova command
  interactions ........ 139–140, 156–158
  null hypothesis ........ 140, 156
  main effects ........ 138–139, 155–158
  null hypothesis ........ 139
  versus first-order effects ........ 139–140
  marginal means ........ 138–139, 154–155
  one-way marginal means ........ 155
  two-way marginal means ........ 154
  notation ........ 133–134
  partitioning the variance ........ 140–142
  ss between ........ 141
  ss interaction ........ 141–142
  ss main effects ........ 141
  simple effects ........ 146–149, 163–165
  estimating in Stata .... see contrast command
    null hypothesis ........ 147
    source table ........ 142–143
    three-factor design ........ 151–166
    three-way interactions ........ 156, 158–159
    null hypothesis ........ 158–159
    two-factor design ........ 134–151
    visualize data ........ 134–138, 152–153
  file paths ........ 12

G
  General Social Survey ........ 38
  generate command ........ 17
    n function ........ 288
    handling missing data ........ 18–19
    getting help ........ 32–33
  graph box command ........ 24, 287
    by() option ........ 153
    factorial ANOVA ........ 135–136, 153
    over() option ........ 153
    repeated measures ........ 171, 192
Subject index

graph dot command ............... 261
graphics introduction .......... 22–27

H
histogram command ...... 23, 281, 290

I
in qualifier .................... 15, 16
interactions .................... 90–109
categorical by continuous .... 91–107
continuous by continuous .... 107–109
interpretation of coefficients ... 108
margins command .... 108–109
marginsplot command .... 108–109
visualizing relationships .... 108–109
dichotomous by continuous .... 91–101
factor-variable notation .... 94
first-order coefficients .... 96
interpreting coefficients .... 95–101
multiple intercept, multiple slope model .... 99–101
factor notation .... 100
lincom command .... 100
polytomous by continuous .... 101–107
interpretation of coefficients ... 102–103
margins command .... 104
marginsplot command .... 104
using factor notation to prevent errors .... 102
visualizing the interaction .... 104–107
probing meaning .... 96–101
problems with dichotomization .... 107–109
product between variables .... 94
interactions, continued
simple regression equation .... 96–101
lincom command .... 98–99
margins command .... 97–98
marginsplot command .... 97–98
plotting .... 97–98
interocular trauma test .... 329

L
label values command ........ 19
label variable command .... 19
labels .... 19
value labels .... 19
variable labels .... 19
lincom command .... 73, 305
between-clusters and within-cluster relationships .... 271
contrast after the regress command .... 73–74
planned comparisons .... 123–125
linear combinations .... see lincom command
lines .... 43
intercept .... 43
slope .... 43
list command .... 15
combined with if and in qualifiers .... 17
repeated measures .... 173
lrtest command .... 279, 298, 348, 350, 353, 389
repeated measures .... 199

M
margins command .... 50–51, 299, 302, 305, 309
expected values .... 65
following the anova command .... 145–146, 160
inferential uncertainty .... 65–70
marginsplot command .... 66–70, 299, 302, 305, 309
by option .... 309
factorial ANOVA .... 136–138
Subject index

marginsplot command, continued
following the anova command ... 145–146, 160–163
methods for improving ... 67–70
noci option ... 309
xdimension() option ... 162
mata command ... 363, 364
mean ... 40
measurement invariance ... 398–427
across groups ... 400–413
configural invariance ... 400–406
invariant factor means ... 412–413
invariant factor variances ... 412
metric invariance ... 407
residual invariance ... 408
scalar invariance ... 407–408
sem command ... 402–405
structural invariance ... 412–413
across time ... 413–427
configural invariance ... 413–424
identification ... 414–424
metric invariance ... 424–425
residual invariance ... 426
scalar invariance ... 425–426
sem command ... 417–424
structural invariance ... 427
steps ... 399–400
using the CFI to evaluate ... 409–411
mixed command
between-clusters and within-cluster relationships ... 270
cov(unstructured) option ... 278
covariance(unstructured)
option ... 297
cross-level interaction ... 304
dfmethod() option ... 175, 190
dfmethod(satterthwaite) option ... 178, 190
display residual correlation matrix
.... see estat wcorrelation command
fit indices ... see estat ic command
longitudinal data ... 297
noconstant option ... 175, 306
mixed command, continued
nofetable option ... 249
noheader option ... 249
random slopes ... 278
random-effects specification ... 175
random-intercept model ... 248–252
remi option ... 175
repeated measures ... 175, 195
residuals() option
by() option ... 198
residuals(ar 1) option ... 181
residuals(exchangeable) option ...
... 178
residuals(independent)
option ... 175, 176
residuals(toeplitz) option ...
... 183
residuals(unstructured) option ...
... 186, 195
separate intercepts, separate slopes model ... 306
stddeviations option ... 178, 184, 249, 279
syntax basics ... 175–176
t() option for residuals() ... 181, 183, 186
time-invariant covariate ... 301
time-varying covariate ... 308
multilevel models
adding a predictor ... 262–264
atomistic fallacy ... 267
basic model ... 244
Bayes's theorem ... 255
between-clusters variance ... 244, 245
between-clusters versus within-
cluster effects ... 264–266
between-clusters versus within-
cluster relationships ... 267–273
caterpillar plot ... 253–254
centering ... 292
complete pooling ... 254
conditional independence ... 246
contextual effect ... 273
correlated random effects ... 276
Subject index

multilevel models, continued
  definition of random effects .... 246
  ecological fallacy .......... 267
  fitting them in Stata .... see mixed command
  interpreting random slopes ... 280–283
  intraclass correlation ... 250–252, 280
  fitting them in Stata .... see estat icc command
  issues with clustered data ... 239–243
  level-specific relationships ... 266
  longitudinal data ............ 296
  need for growth model ....... 290
  random slope ............... 246–249
  longitudinal data introduction ... 287
  no pooling .............. 254
  nonindependence .......... 239–242
    sources .............. 242–243
    substantive benefits ... 242–243
  partial pooling ........... 255–259
  partitioning variance ...... 244–246
  predicting cluster means ... 252–261
  random effects
    compared to fixed effects ... 247
    examples .............. 246
  random intercepts ........ 246–249
  random slopes .......... 273–283
  separate intercepts, separate slopes
    model ............... 306
  time-varying covariate .... 307
  total relationships ....... 266
  total residual ............ 244
  versus repeated-measures models ... 243
  visualizing partitioning ... 244
  within-cluster variance ... 244, 245

multiple comparisons .......... 120–129
  adjust for multiple comparisons
    .... see adjust for multiple comparisons
  adjusting in Stata .... see pwcompare command
  \alpha_{\text{joint}} ........ 121–122
  protecting against \alpha inflation ....
    .......... 122–129
multiple regression .......... 86–90
  centering predictors ....... 87–88
  interpreting coefficients ... 87–90
  model fit ................ 86
  R^2 .................. 87
  root mean squared error .... 87
  partial slopes ............ 88
  regress command .......... 86
  relationship among predictors ... 89–90
  rescaling predictors ....... 88–89

N
  nlcom command .... 338, 340, 341, 353
  normal() function ........ 211
  null hypothesis significance testing .... 60–63, 202
    alternative hypothesis .... 60
    criticisms ............ 63–64
    null hypothesis .... 60
    p-value .............. 63
    regress output .......... 63
    steps ............... 61–63

O
  one-way ANOVA .......... 116–129
    alternative hypothesis .... 117
    between versus within variance ... 117–119
    degrees of freedom ........ 118
    estimating in Stata .... see oneway command or anova command
    follow-up tests .......... 119–129
    mean squares .......... 118–119
    multiple comparisons .... see multiple comparisons
Subject index

one-way ANOVA, continued
  null hypothesis .............. 117
  ratio of variances ............. 119
  sum of squares .......... 117–118
  oneway command .............. 119

  power command, continued
  one-way ANOVA .......... 223–226
  f ................................ 223
  sample-size estimates ...... 225
  onecorrelation .......... 221–223
  oneway .................. 224–226
  parallel option ......... 225–226
  sample-size estimates .... 229
  t test .................. 215–220
  detectable difference . 216–217
  sample-size calculation .... 218
  twomeans ................ 214–215
  twoway .................. 227–229
  parallel option ......... 229
  varcolumn() option .... 227
  varrow() option .......... 227
  varrowcolumn() option .... 227
  varying multiple parameters . 219
  z test .................. 214–215

  predict command .......... 49, 70–73
  residual option ........... 49
  fitted option .............. 299
  inferential uncertainty ..... 70–71
  plotting the results ....... 71–73
  predictive uncertainty .... 71–73
  stdf option ............... 72
  stdp option ................ 70
  predictive uncertainty .... see predict command, predictive uncertainty

  program command .......... 204
  bootstrapping ............... 342
  program define command ... 40
  Project Manager .......... see reproducible analysis

  pwcompare command .......... 191
  effects option .......... 191
  mcompare() option ........ 191
  Scheffé ................. 126–127
  small option .......... 191
  small samples .......... 190
  Tukey’s HSD .......... 127–129

  P

  paran command ............... 368
  pcf option ................ 368
  partitioning variance
    regression ............ 51–53
  planned comparisons ....... 122–125
  contrast weights .......... 122
  degrees of freedom ....... 123
  F test .................. 123
  linear combinations ...... 122–125
  Stata estimation ........... 123
    ...... see test command and
  1incom command
  sum of squares ........... 123
  point-and-click .......... 9
  problems ................ 9
  versus command language ... 10
  population parameters versus sample-
  based estimates .......... 44
  power ........ see also simulate command
    definition ............. 202
    estimating in Stata .... see power command
    null and alternative distribution ...
    .................. 202–210
    simulation ............ 204–210
    type M error ........... 230, 233–235
    type S error ........... 230–233
    z test ................ 210–214
    z test formula .......... 211
  power command ............ 214–229
  correlation .............. 220–223
    detectable correlation .. 222–223
    sample-size calculation .... 221–222
  diff() option ............. 218
  factorial ANOVA ......... 226–229
  graph() option .......... 216
  knownsds option .......... 215
Subject index

R

$R^2$ ............................................. 52
formula .................................. 52
interpretation .......................... 53
Stata output .............................. 52
regress command ...................... 45
output ................................... 45
regression
  centering predictors .......... 47
  conceptual introduction ...... 43
  equation ............................... 43
  expected values ................. 44
  general bivariate equation .... 44
  intercept computation .......... 45
  intercept interpretation ...... 47–48
margins command . see margins
command
predict command . see predict
command
predicted values ................. 49–51
reason for error term .......... 43
residuals ............................... 48–49
definition .............................. 48
slope computation ................. 45
slope interpretation ............. 46–47
Stata command . see regress
command
reliability ......................... 315
definition ......................... 319
factor analysis . see factor analysis
partitioning variability in items
............. 319
reasons for factor analysis .... 320
shared variance across items . 318–320
variability in item scores .... 318
repeated measures
  $\Sigma$ ........................................ 174
benefits of mixed models .... 167–168
block diagonal matrix ......... 189
covariance among residuals .... 174
repeated measures, continued
  covariance structures ...... 176–189
  autoregressive ............. 180–182
  compound symmetry .... 177–180
  independent ............. 176–177
  Toeplitz .................... 183–185
  unstructured ............. 186–189
degrees of freedom .......... 189–190
denominator degrees of freedom . . ......... 179
estimating in Stata . see mixed
command
heteroskedastic residuals .. 197–200
maximum likelihood versus least
  squares ......................... 167
model formulation ............. 172–173
multiple factors ............. 192–197
nonindependence ............. 173
replace command .............. 17
replication ......................... 5–8
reproducible analysis .......... 5, 27–31
log files .............................. 30
text versus SMCL .................. 30
Project Manager ............. 30–31
role of do-files .......... 28
annotating ......................... 29
versus point-and-click ....... 29
suggestions for ................. 28
workflow ......................... 31
recommendations .......... 31
reshape command ............. 135, 171–172
i() option ....................... 172
j() option ....................... 172
naming recommendations .... 172
reshape long command .. 172
reshape wide command .... 172
residual variance . see conditional
covariance
residuals . see regression residuals
root mean squared error . see
  conditional variance
### S

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sampling distribution</td>
<td>56, 202</td>
</tr>
<tr>
<td>mean of</td>
<td></td>
</tr>
<tr>
<td>shape of</td>
<td></td>
</tr>
<tr>
<td>simulating</td>
<td></td>
</tr>
<tr>
<td>standard deviation of</td>
<td>56</td>
</tr>
<tr>
<td>standard error</td>
<td></td>
</tr>
<tr>
<td>screeplot command</td>
<td>367</td>
</tr>
<tr>
<td>sem command</td>
<td></td>
</tr>
<tr>
<td>constraining latent correlation</td>
<td>388</td>
</tr>
<tr>
<td>constraining latent variables</td>
<td>386</td>
</tr>
<tr>
<td>constraints</td>
<td>328, 345</td>
</tr>
<tr>
<td>equation goodness of fit</td>
<td></td>
</tr>
</tbody>
</table>

#### Stata interface, continued

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review window</td>
<td>11</td>
</tr>
<tr>
<td>Variable window</td>
<td>11</td>
</tr>
<tr>
<td>statsby command</td>
<td>275, 292–293</td>
</tr>
<tr>
<td>sum of squares</td>
<td>52</td>
</tr>
<tr>
<td>model</td>
<td>52</td>
</tr>
<tr>
<td>residual</td>
<td>52</td>
</tr>
<tr>
<td>total</td>
<td>52</td>
</tr>
<tr>
<td>summarize command</td>
<td>20–21</td>
</tr>
<tr>
<td>assisting with centering</td>
<td>47</td>
</tr>
<tr>
<td>repeated measures</td>
<td>170</td>
</tr>
<tr>
<td>returned values</td>
<td>47</td>
</tr>
</tbody>
</table>

### T

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>t test</td>
<td>114–116</td>
</tr>
<tr>
<td>effect size</td>
<td>115–116</td>
</tr>
<tr>
<td>formula and procedures</td>
<td>114</td>
</tr>
<tr>
<td>null hypothesis</td>
<td>114</td>
</tr>
<tr>
<td>table command</td>
<td>21–22</td>
</tr>
<tr>
<td>by() option</td>
<td>134, 152</td>
</tr>
<tr>
<td>contents() option</td>
<td>134</td>
</tr>
<tr>
<td>factorial ANOVA</td>
<td>134–135, 152</td>
</tr>
<tr>
<td>format() option</td>
<td>134</td>
</tr>
<tr>
<td>marginal means</td>
<td>138</td>
</tr>
<tr>
<td>tabstat command</td>
<td>113</td>
</tr>
<tr>
<td>stat option</td>
<td>336</td>
</tr>
<tr>
<td>tabulate command</td>
<td>21–22</td>
</tr>
<tr>
<td>test command</td>
<td></td>
</tr>
<tr>
<td>planned comparisons</td>
<td>123–125</td>
</tr>
<tr>
<td>ttest command</td>
<td>114–115</td>
</tr>
<tr>
<td>twoway</td>
<td></td>
</tr>
<tr>
<td>function command</td>
<td>260</td>
</tr>
<tr>
<td>lfit command</td>
<td>269, 292, 294</td>
</tr>
<tr>
<td>rcap command</td>
<td>276, 293</td>
</tr>
<tr>
<td>scatter command</td>
<td>25–27, 260, 269, 276, 291–294, 369</td>
</tr>
<tr>
<td>type I error rate</td>
<td>203</td>
</tr>
<tr>
<td>type II error</td>
<td>203</td>
</tr>
</tbody>
</table>

### U

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>use command</td>
<td>12</td>
</tr>
<tr>
<td>file paths</td>
<td>12</td>
</tr>
</tbody>
</table>
Subject index

V
validity..........................315
variable types
  date and time...............14
  numeric.......................14
  string........................15
violin plots...................113
  vioplot command.............113

W
wide versus long datasets.....169–170
working directory..............12
  benefits of setting..........13

Y
Yale–Brown Obsessive Compulsive
  Scale.........................398