APPENDIX B

Statistical Symbols

A	Factor A, the independent variable in an experiment.
A_1, A_2, A_3	Levels of factor A in a factorial design.
α	Alpha, the probability of a Type I error.
$A \times B$	The representation of the interaction of factors A and B in a factorial design.
a	(1) Number of levels of factor A or (2) Y-intercept of an equation for a straight line in a regression analysis.
B	Factor B, the second independent variable in a factorial design.
B_1, B_2, B_3	Levels of factor B in a factorial design.
b	(1) Number of levels of factor B or (2) slope of a straight line in a regression analysis.
β	Beta, the probability of a Type II error.
χ^2	Chi-squared statistic.
χ^2_{crit}	Critical value of χ^2.
χ^2_{obs}	Value of χ^2 statistic obtained from data.
CD	Critical difference in a multiple comparison test.
CP_{XY}	Cross products of X and Y in a correlational study.
cum f or *cf*	Cumulative frequency of a score.
cf_L	Cumulative frequency of scores up to the lower real limit of an interval in a grouped frequency distribution.
cum rf or *crf*	Cumulative relative frequency of a score.
cum %f or *c%f*	Cumulative percentage frequency of a score.
D	(1) Difference in a pair of ranked scores for an individual; used in Spearman rank-order correlation coefficient; or (2) Difference between two scores obtained from a subject in a within-subjects design.
df	Degrees of freedom. In an analysis of variance, the *df* are usually subscripted, such as df_A, df_B, $df_{A\times B}$, df_{Error}, or df_{Total}, to indicate to which source of variance they correspond.
η^2	Eta squared.
E_{rc}	Expected frequency of a score in row r, column c, of a chi-square test contingency table.
f	Frequency of a score.
f_i	Frequency of scores in an interval of a grouped frequency distribution.
F	The F statistic in the analysis of variance.
F_{crit}	Critical value of F.
F_{obs}	Value of F obtained from data.
H_0	Statistical null hypothesis.
H_1	Statistical alternative hypothesis.
i	Size or width of the class interval in a grouped frequency distribution.
M	Sample mean. The symbol used in publications following the editorial style of the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001).
Mdn	Median.
MS	Mean square, a variance estimate in the analysis of variance. Mean squares typically are subscripted, such as MS_A, MS_B, $MS_{A\times B}$, or MS_{Error}, to indicate which source of variance they represent.
MSE	Mean square error. The symbol used to identify the MS_{Error} for an analysis of variance in publications following the editorial style of the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001).
μ	Mu, the population mean.
$\mu_{\overline{X}}$	Mean of the theoretical sampling distribution of the mean.
N	Total number of scores in a sample or the total number of scores in an experiment.
N_{pairs}	Number of pairs of scores.
n	Number of scores in a subgroup of a larger sample.
n_1, n_2	Number of scores in a level of a one-factor design.
n_{AB}	Number of scores in a cell of a two-factor design.
O_{rc}	Observed frequency of a score in row r, column c of a chi-square test contingency table.
%f	Percentage frequency of a score.
P	A percentile point expressed as a proportion. Used to obtain the score at a specified percentile point.
P_X	Percentile rank of score of X.

p	Probability.
q	Studentized range statistic used in the Tukey HSD test.
r	Pearson correlation coefficient for a sample.
r_{crit}	Critical value of Pearson correlation coefficient.
r_{obs}	Observed value of a Pearson correlation between variables X and Y.
rf	Relative frequency of a score.
ρ	Rho, the population correlation coefficient.
ρ_S	Population Spearman rank-order correlation coefficient.
r_S	Spearman rank-order correlation coefficient.
r^2	Coefficient of determination.
σ	Sigma, the population standard deviation.
σ^2	Population variance.
$\sigma_{\overline{X}}$	Standard error of the mean.
$\sigma_{\overline{X}_1-\overline{X}_2}$	Standard error of the difference between means.
Σ	Summation
$\sum_{i=1}^{N}$	Summation notation from $i = 1$ to N.
S	Sample standard deviation.
s	Estimated population standard deviation.
SD	Standard deviation. The symbol used in publications following the editorial style of the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001).
S^2	Sample variance.
s^2	Estimated population variance.
s^2_{pooled}	Pooled variance estimate for the difference between two population means.
$s_{\overline{X}}$	Estimated standard error of the mean.
SE	Standard error of the mean. The symbol used in publications following the editorial style of the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001).
$s_{\overline{X}_1-\overline{X}_2}$	Estimated standard error of the difference between means.
$s_{Y \cdot X}$	Standard error of estimate when predicting Y from X.
ΣR	Sum of ranks.
SS	Sum of squares. In an analysis of variance, a SS is usually subscripted, such as SS_A, SS_B, $SS_{A\times B}$, SS_{Error}, or SS_{Total}, to indicate which source of variation it represents.
$SS_{Residual}$	The value of $\Sigma(Y - Y')^2$.
SS_X	Sum of squares of the X variable in a correlation.
SS_Y	Sum of squares of the Y variable in a correlation.
t	t statistic in the t test.
t_{crit}	Critical value of t.
t_{ind}	t statistic obtained in the t test for independent groups.
t_{obs}	Value of t obtained from data.
t_{rel}	t statistic obtained in the t test for related measures.
T	Wilcoxon T statistic.
T_{crit}	Critical value of T.
T_{obs}	Value of T obtained from data.
U	Mann–Whitney U statistic.
U_{crit}	Critical value of U.
U_{obs}	The smaller value of U obtained from data.
X	A subject's score on the variable identified as the X variable. Depending on the design used, a score may be represented by X_i, X_{ij}, or X_{ijk}.
$X_{highest\ URL}$	Upper real limit for the highest score in a distribution of scores.
$X_{lowest\ LRL}$	Lower real limit for the lowest score in a distribution.
X_L	Lower real limit of an interval containing the score X in a frequency distribution.
X_P	Score at the P percentile point in a distribution.
X_{50}	Score corresponding to the median of a distribution.
$\overline{X}$	X bar, the sample mean.
$\overline{X}_{A_1}, \overline{X}_{A_2}, \overline{X}_{A_3}$	Main effect means for levels of factor A.
$\overline{X}_{B_1}, \overline{X}_{B_2}, \overline{X}_{B_3}$	Main effect means for levels of factor B.
$\overline{X}_{AB}$	Cell mean in a two-factor design.
$\overline{X}_G$	Grand mean.
$\overline{X}_S$	Subject mean in a within-subjects design.
$\overline{X}_{\overline{X}}$	Mean of the empirical sampling distribution of the mean.
$\overline{X}_{\overline{X}_1-\overline{X}_2}$	Mean of an empirical sampling distribution of the difference between means.
Y	A subject's score on the variable identified as the Y variable.
$\overline{Y}$	Y bar. The sample mean for scores identified as the Y variable.
Y'	Predicted value of Y from a linear regression line.
z	Value of a score obtained from using the z transformation.