

Typos in 7th Edition of

Introduction to Statistical Methods and Data Analysis

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The following pages contain corrections to the first printing of the 7th Edition of *Introduction to Statistical Methods and Data Analysis*. We apologize for any inconvenience that may have resulted from the errors found in the first printing of the 7th Edition of our book. Many of the errors resulted from the 7th Edition being an entirely new typing of the book.

Because the sample sizes are relatively large, we will use the approximated method for computing the critical value for the multiple comparison:

$$KW \approx \frac{q_\alpha(t, \infty)}{\sqrt{2}} \sqrt{\frac{n_T(n_T + 1)}{12} \left(\frac{1}{n_i} + \frac{1}{n_j} \right)}$$

where $q_\alpha(t, \infty) = q_{.05}(4, \infty) = 3.63$, $n_1 = n_2 = n_3 = n_4 = 14$, and $n_T = 4(14) = 56$. Therefore, the critical value for all six comparisons is

$$KW \approx \frac{3.63}{\sqrt{2}} \sqrt{\frac{56(56 + 1)}{12} \left(\frac{1}{14} + \frac{1}{14} \right)} = 15.82$$

Thus, any pair of treatments having $|\bar{R}_i - \bar{R}_j| \geq 15.82$ will be declared significantly different. The results of the six comparisons are summarized in Table 9.11.

TABLE 9.11
Summary of the nonparametric multiple comparison

Treatment Pair	$ \bar{R}_i - \bar{R}_j $	Conclusion
Control vs 3-MC	$ 25.8 - 37.8 = 12$	Not significantly different
Control vs AIA	$ 25.8 - 30.1 = 4.3$	Not significantly different
Control vs PABA	$ 25.8 - 20.4 = 5.4$	Not significantly different
3-MC vs AIA	$ 37.8 - 30.1 = 7.7$	Not significantly different
3-MC vs PABA	$ 37.8 - 20.4 = 17.4$	Significantly different
AIA vs PABA	$ 30.1 - 20.4 = 9.7$	Not significantly different

Thus, only one pair of treatments, 3-MC vs PABA, had significantly different survival times. ■

9.8 RESEARCH STUDY: Are Interviewers' Decisions Affected by Different Handicap Types?

There are approximately 50 million people in the United States who report having a handicap. Furthermore, it is estimated that the unemployment rate of noninstitutionalized handicapped people between the ages of 18 and 64 is nearly double the unemployment rate of people with no impairment. Thus, it appears that people with disabilities have a more difficult time obtaining employment. One of the problems confronting people having a handicap may be a bias by employers during the employment interview.

Defining the Problem

The paper "Interviewers' Decisions Related to Applicant Handicap Type and Rater Empathy" (Cesare et al., 1990), describes a study that examines these issues. The purposes of the study were to investigate whether different types of physical handicaps produce different levels of empathy in raters and to examine if interviewers' evaluations are affected by the type of handicap of the person being interviewed.

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Edu. 11.50 There has been an increasing emphasis in recent years on making sure that young women are given the same opportunities to develop their mathematical skills as young men are given in U.S. educational systems. The following table provides the SAT scores for male and female students over a 34-year period.

Gender/Type	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Male/Verbal	506	508	509	508	511	514	515	512	512	510
Female/Verbal	498	496	499	498	498	503	504	502	499	498
Male/Math	515	516	516	516	518	522	523	523	521	523
Female/Math	473	473	473	474	478	480	479	481	483	482
Gender/Type	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Male/Verbal	505	503	504	504	501	505	507	507	509	509
Female/Verbal	496	495	496	497	497	502	503	503	502	502
Male/Math	521	520	521	524	523	525	527	530	531	531
Female/Math	483	482	484	484	487	490	492	494	496	495
Gender/Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Male/Verbal	507	509	507	512	512	513	505	503	502	502
Female/Verbal	504	502	502	503	504	505	502	500	499	497
Male/Math	533	533	534	537	537	538	536	532	532	533
Female/Math	498	498	500	503	501	504	502	499	499	498
Gender/Type	2010	2011	2012	2013						
Male/Verbal	502	500	498	499						
Female/Verbal	498	495	493	494						
Male/Math	533	531	532	531						
Female/Math	499	500	499	499						

Source: CollegeBoard. (2013). Total Group Profile Report.

- a. Plot the six pairs of data values in scatterplots: Male/Verbal versus Female/Verbal, Male/Math versus Male/Verbal, and so on.
 - b. Which, if any, of the six correlations are significantly different from 0 at the 5% level?
 - c. Do the plots reflect the sizes of the correlations between the pairs of variables?
 - d. Are male verbal scores more correlated with male or female math scores?
- Edu. 11.51** Refer to Exercise 11.50.
- a. Place a 95% confidence interval on the six correlations. ^(a)
 - b. Using the confidence intervals from part (a), are there any differences in the degree of correlation between male and female math scores? ^(a)
 - c. Using the confidence intervals from part (b), are there any differences in the degree of correlation between male and female verbal scores?
 - d. Are your answers to parts (b) and (c) different from your answer to part (d) in Exercise 11.50? ^(d)

Supplementary Exercises

11.52 A construction science class project was to compare the daily gas consumption of 20 homes with a new form of insulation to that of 20 similar homes with standard insulation. The students set up instruments to record the temperature both inside and outside of the homes over a 6-month period of time (October–March). The average differences in these values are given below. The students also obtained the average daily gas consumption (in kilowatt hours). All the homes were heated with gas. The data are given here:

- Soc. 11.79** Refer to Exercise 11.76.
- Obtain the regression line with the one unusual town removed from the data set.
 - Estimate the expenditure on public safety for a town of 37,000 people. Compare this estimate with an estimate using the complete data set.
 - Compare the estimated slope from the regression fit using the data set with the unusual town removed to the estimated slope from the regression fit using the complete data set? Discuss the impact of an extreme data value on the reliability of the inferences that can be made from the data about the population from which the data were obtained.

Bio. 11.80 In screening for compounds useful in treating hypertension (high blood pressure), researchers assign six rats to each of three groups. The rats in group 1 receive .1 mg/kg of a test compound; those in groups 2 and 3 receive .2 and .4 mg/kg, respectively. The response of interest is the decrease in blood pressure 2 hours postdose compared to the corresponding predose blood pressure. The data are shown here:

	Dose, x	Blood Pressure Drop, y (in mm Hg)					
Group 1	.1 mg/kg	10	12	15	16	13	11
Group 2	.2 mg/kg	25	22	26	19	18	24
Group 3	.4 mg/kg	30	32	35	27	26	29

- Fit the following model to the data.

$$y = \beta_0 + \beta_1 \log_{10} x + \varepsilon$$
 - Use residual plots to examine the fit to the model in part (a).
 - Conduct a statistical test of $H_0: \beta_1 \leq 0$ versus $H_a: \beta_1 > 0$. Give the p -value for your test.
- Ag. 11.81** A laboratory conducts a study to examine the effect of different levels of nitrogen on the yield of lettuce plants. Use the data shown here to fit a linear regression model. Test for possible lack of fit of the model.

Coded Nitrogen	Yield (Emergent Stalks per Plot)
1	21, 18, 17
2	24, 22, 26
3	34, 29, 32

Med. 11.82 Researchers measured the specific activity of the enzyme sucrase extracted from portions of the intestines of 24 patients who underwent an intestinal bypass. After the sections were extracted, they were homogenized and analyzed for enzyme activity (Carter, 1981). Two different methods can be used to measure the activity of sucrase: the homogenate method and the pellet method. Data for the 24 patients are shown here for the two methods:

Patient	Sucrase Activity as Measured by the Homogenate and Pellet Methods	
	Homogenate Method, y	Pellet Method, x
1	18.88	70.00
2	7.26	55.43
3	6.50	18.87
4	9.83	40.41
5	46.05	57.43
6	20.10	31.14
7	35.78	70.10
8	59.42	137.56
9	58.43	221.20
10	62.32	276.43

(continued)

TABLE 12.4

Drill performance data

AVTEM	LOGV	IT	QW	VS	I2	Q2	V2	Test	AVTEM	LOGV	IT	QW	VS	I2	Q2	V2	Test
185	3.6	2	6	10	4	1	1	1	168	3.4	4	7	11	0	0	0	2
176	3.7	2	6	10	4	1	1	2	160	2.9	4	7	12	0	0	1	1
177	3.6	2	6	11	4	1	0	1	154	3.1	4	7	12	0	0	1	2
184	3.7	2	6	11	4	1	0	2	169	2.8	4	8	10	0	1	1	1
178	3.6	2	6	12	4	1	1	1	156	2.9	4	8	10	0	1	1	2
169	3.4	2	6	12	4	1	1	2	168	2.7	4	8	11	0	1	0	1
185	3.2	2	7	10	4	0	1	1	161	2.7	4	8	11	0	1	0	2
184	3.2	2	7	10	4	0	1	2	156	2.6	4	8	12	0	1	1	1
180	3.2	2	7	11	4	0	0	1	158	2.7	4	8	12	0	1	1	2
184	3.5	2	7	11	4	0	0	2	164	3.7	5	6	10	1	1	1	1
179	3.0	2	7	12	4	0	1	1	163	3.7	5	6	10	1	1	1	2
173	3.2	2	7	12	4	0	1	2	161	3.7	5	6	11	1	1	0	1
179	2.9	2	8	10	4	1	1	1	158	3.4	5	6	11	1	1	0	2
185	2.7	2	8	10	4	1	1	2	154	3.4	5	6	12	1	1	1	1
180	2.8	2	8	11	4	1	0	1	162	3.7	5	6	12	1	1	1	2
180	2.7	2	8	11	4	1	0	2	163	2.8	5	7	10	1	0	1	1
169	2.9	2	8	12	4	1	1	1	166	3.0	5	7	10	1	0	1	2
177	2.8	2	8	12	4	1	1	2	159	3.3	5	7	11	1	0	0	1
172	3.6	3	6	10	1	1	1	1	156	3.3	5	7	11	1	0	0	2
171	3.9	3	6	10	1	1	1	2	152	3.3	5	7	12	1	0	1	1
172	3.8	3	6	11	1	1	0	1	150	3.3	5	7	12	1	0	1	2
167	3.6	3	6	11	1	1	0	2	165	2.9	5	8	10	1	1	1	1
165	3.3	3	6	12	1	1	1	1	156	2.7	5	8	10	1	1	1	2
159	3.4	3	6	12	1	1	1	2	155	2.8	5	8	11	1	1	0	1
169	3.0	3	7	10	1	0	1	1	155	3.2	5	8	11	1	1	0	2
174	3.3	3	7	10	1	0	1	2	149	2.6	5	8	12	1	1	1	1
163	3.3	3	7	11	1	0	0	1	152	2.9	5	8	12	1	1	1	2
170	3.3	3	7	11	1	0	0	2	165	3.4	6	6	10	4	1	1	1
169	3.2	3	7	12	1	0	1	1	160	3.7	6	6	10	4	1	1	2
163	3.2	3	7	12	1	0	1	2	157	3.7	6	6	11	4	1	0	1
178	2.7	3	8	10	1	1	1	1	149	3.7	6	6	11	4	1	0	2
165	2.7	3	8	10	1	1	1	2	149	3.8	6	6	12	4	1	1	1
167	2.8	3	8	11	1	1	0	1	145	3.7	6	6	12	4	1	1	2
171	2.8	3	8	11	1	1	0	2	154	3.4	6	7	10	4	0	1	1
166	2.9	3	8	12	1	1	1	1	153	3.2	6	7	10	4	0	1	2
166	2.7	3	8	12	1	1	1	2	150	3.0	6	7	11	4	0	0	1
161	3.7	4	6	10	0	1	1	1	156	3.1	6	7	11	4	0	0	2
162	3.7	4	6	10	0	1	1	2	146	3.2	6	7	12	4	0	1	1
169	3.4	4	6	11	0	1	0	1	153	3.3	6	7	12	4	0	1	2
162	3.7	4	6	11	0	1	0	2	161	2.8	6	8	10	4	1	1	1
159	3.5	4	6	12	0	1	1	1	160	2.9	6	8	10	4	1	1	2
168	3.4	4	6	12	0	1	1	2	156	2.9	6	8	11	4	1	0	1
169	3.1	4	7	10	0	0	1	1	150	2.7	6	8	11	4	1	0	2
165	3.2	4	7	10	0	0	1	2	149	2.9	6	8	12	4	1	1	1
163	3.2	4	7	11	0	0	0	1	151	2.8	6	8	12	4	1	1	2

2.4