CAPITOLO 11

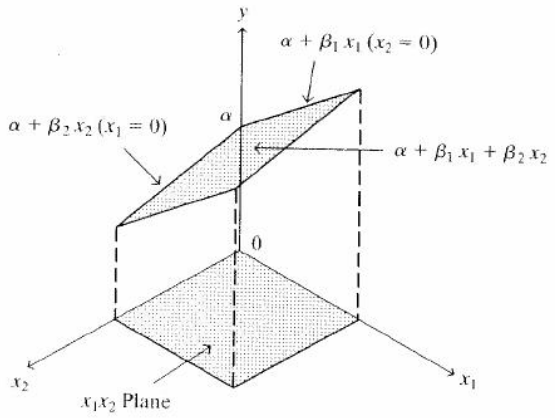


FIGURE 11.1: Graphical Depiction of a Multiple Regression Function with Two Explanatory Variabl

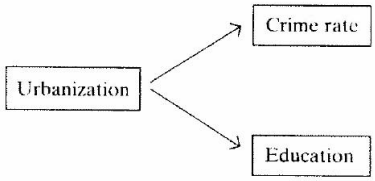


FIGURE 11.2: The Positive Association between Crime Rate and Education May Be Spurious, Explained by the Effects of Urbanization on Each

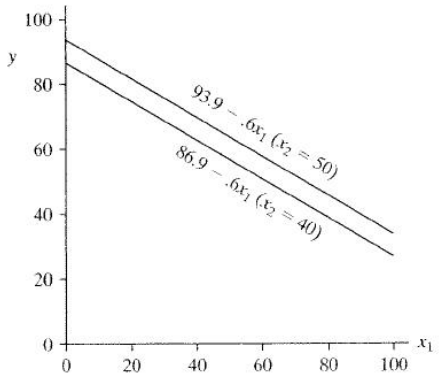


FIGURE 11.3: Partial Relationships between $E(y)$ and x_1 for the Multiple Regression Equation $E(y) = 58.9 - 0.6x_1 + 0.7x_2$. These partial regression equations fix x_2 to equal 50 or 40.

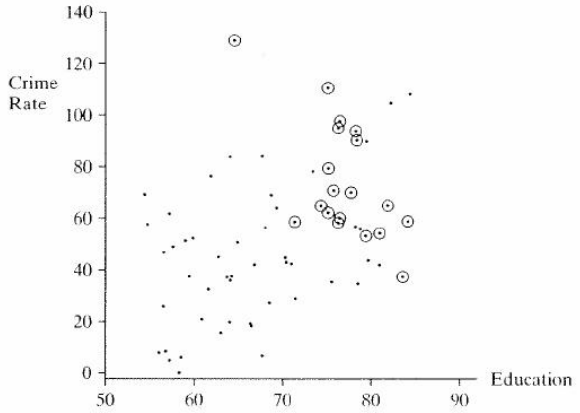


FIGURE 11.4: Scatterplot Relating Crime Rate and Education. The circled points are the counties highest on urbanization. A regression line fitting the circled points has negative slope, even though the regression line passing through *all* the points has positive slope (Simpson's paradox).

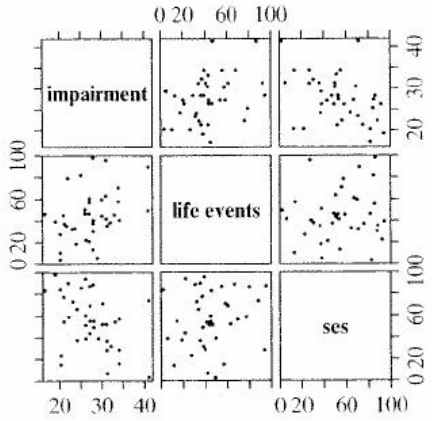


FIGURE 11.5: A Scatterplot Matrix: Scatterplots for Pairs of Variables from Table 11.1

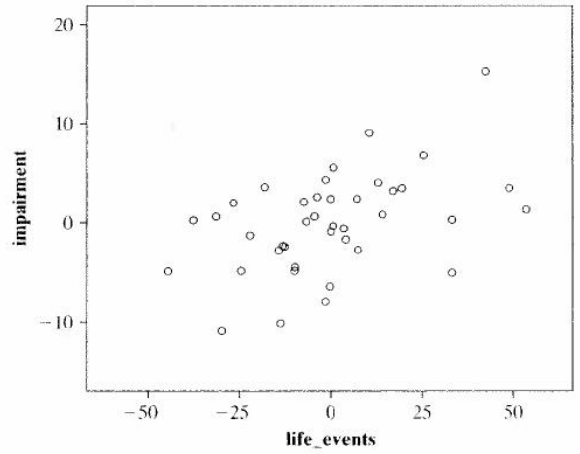


FIGURE 11.6: Partial Regression Plot for Mental Impairment and Life Events, Controlling for SES. This plots the residuals from regressing mental impairment on SES against the residuals from regressing life events on SES.

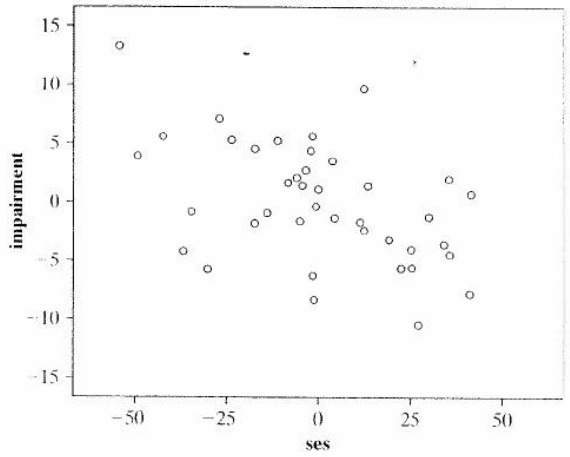


FIGURE 11.7: Partial Regression Plot for Mental Impairment and SES, Controlling for Life Events. This plots the residuals from regressing mental impairment on life events against the residuals from regressing SES on life events.

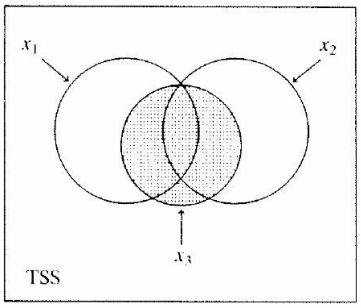


FIGURE 11.8: R^2 Does Not Increase Much when x_3 Is Added to the Model Already Containing x_1 and x_2

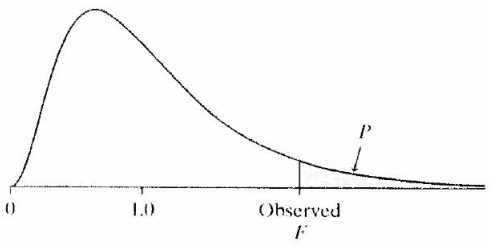


FIGURE 11.9: The F Distribution and the P-Value for F Tests. Larger F values give stronger evidence against H_0.

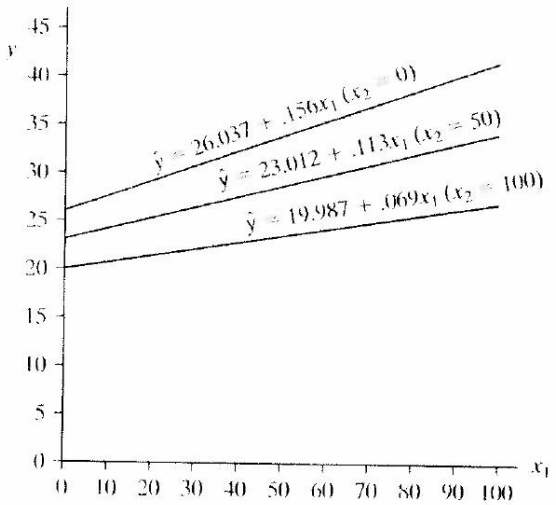


FIGURE 11.10: Portrayal of Interaction between x_1 and x_2 in Their Effects on y

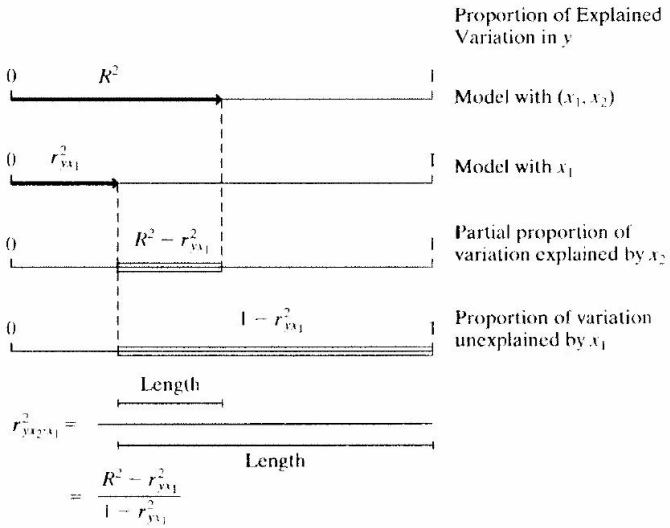


FIGURE 11.11: Representation of $r^2_{yx_2 \cdot x_1}$ as the Proportion of Variability That Can Be Explained by x_2, of that Variability Left Unexplained by x_1

CAPITOLO 12

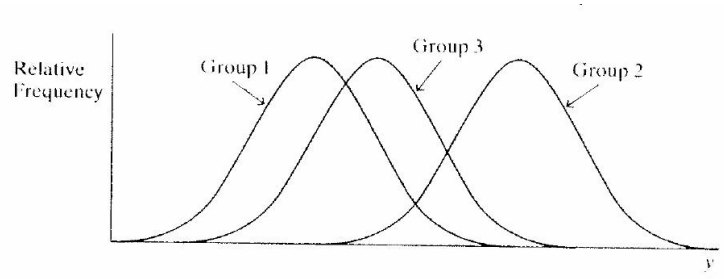


FIGURE 12.1: Assumptions about Population Distributions: Normal with Equal Standard Deviations, σ

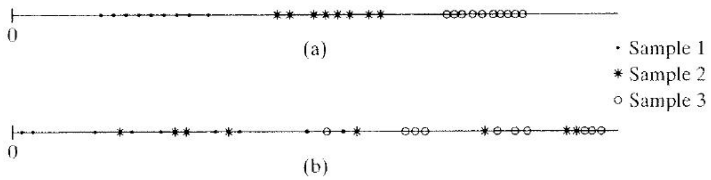


FIGURE 12.2: Two Samples. The means are the same in each case, so variability *between* groups is the same, but variability *within* groups is larger in the second set.

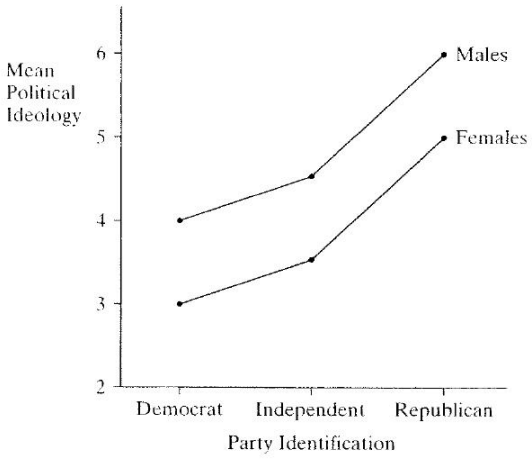


FIGURE 12.3: Mean Political Ideology, by Party Identification and Gender, Displaying No Interaction

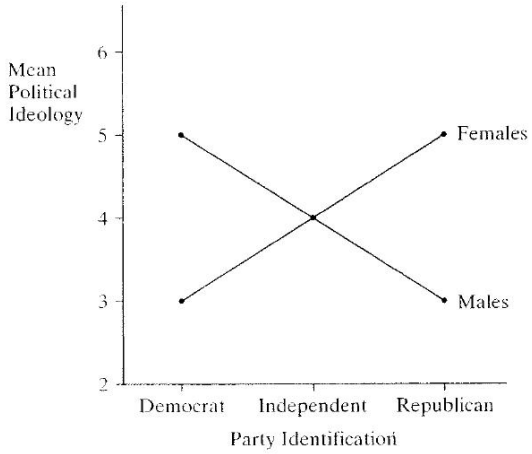


FIGURE 12.4: Mean Political Ideology, by Party Identification and Gender, Displaying Interaction

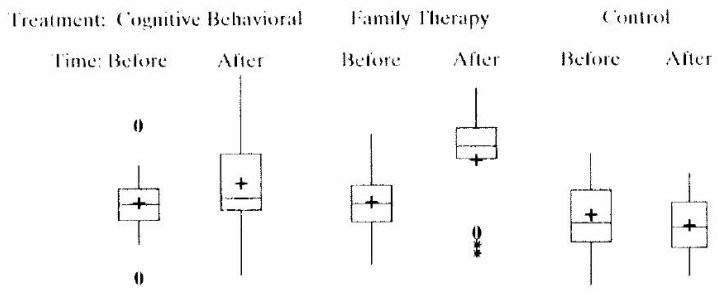


FIGURE 12.5: Box Plots for Weights of Anorexic Girls, by Treatment and Time of Measurement

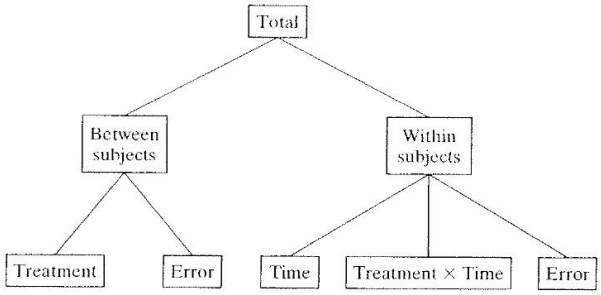
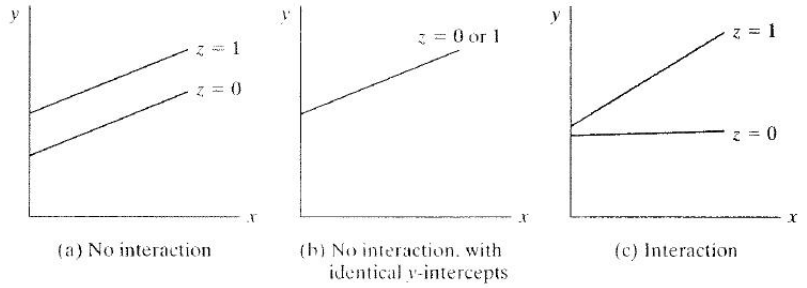


FIGURE 12.6: Partitioning of Variability in Two-Way ANOVA with Treatment and Time Factors and Repeated Measures on Time. Tests involving the within-subjects factor (time) use a separate error term.

CAPITOLO 13



(a) No interaction (b) No interaction, with identical y-intercepts (c) Interaction

FIGURE 13.1: Regression Lines between Two Quantitative Variables, within Categories of a Categorical Variable with Two Categories

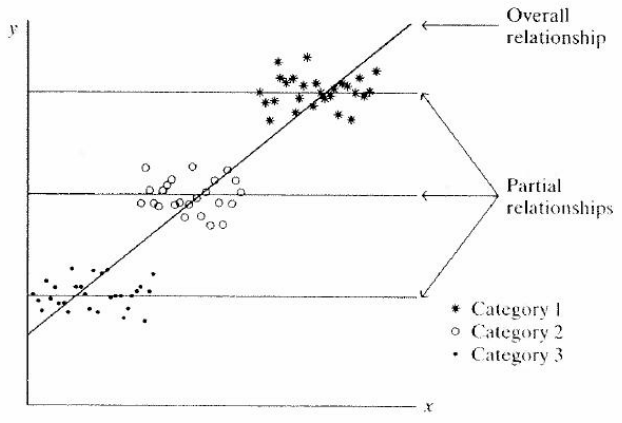


FIGURE 13.2: An Association between Two Quantitative Variables that Disappears after Controlling for a Categorical Variable

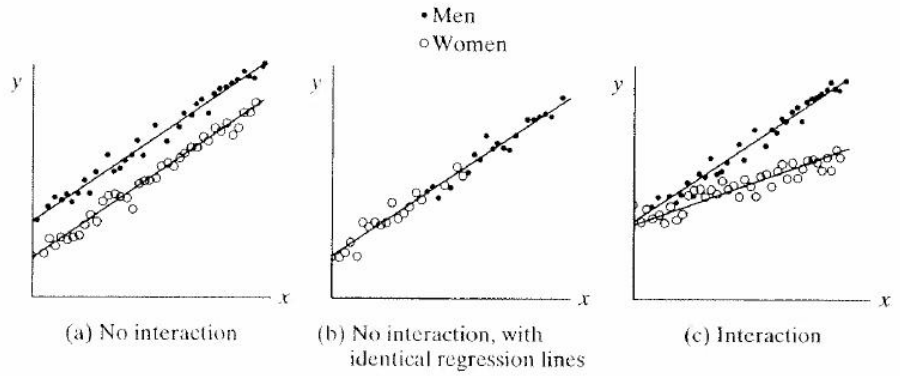


FIGURE 13.3: y = Income by x = Number of Years Experience and z = Gender

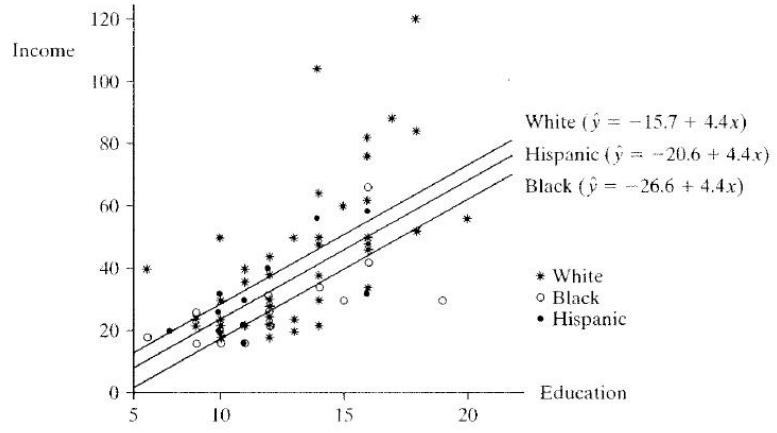


FIGURE 13.4: Plot of Prediction Equation for Model Assuming No Interaction. Each line has the same slope, so the lines are parallel.

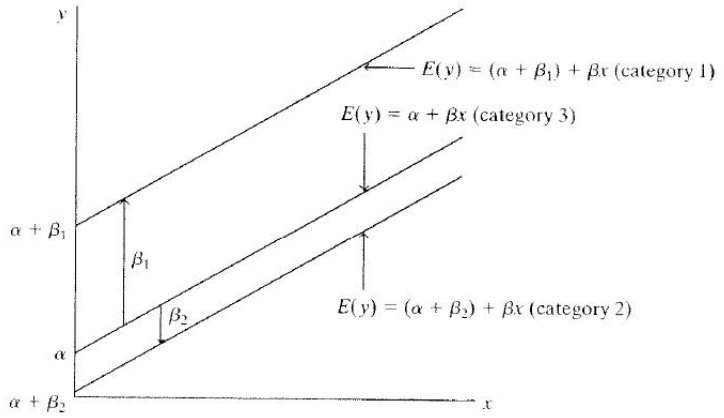


FIGURE 13.5: Graphic Portrayal of a Model with No Interaction, when the Categorical Predictor Has Three Categories

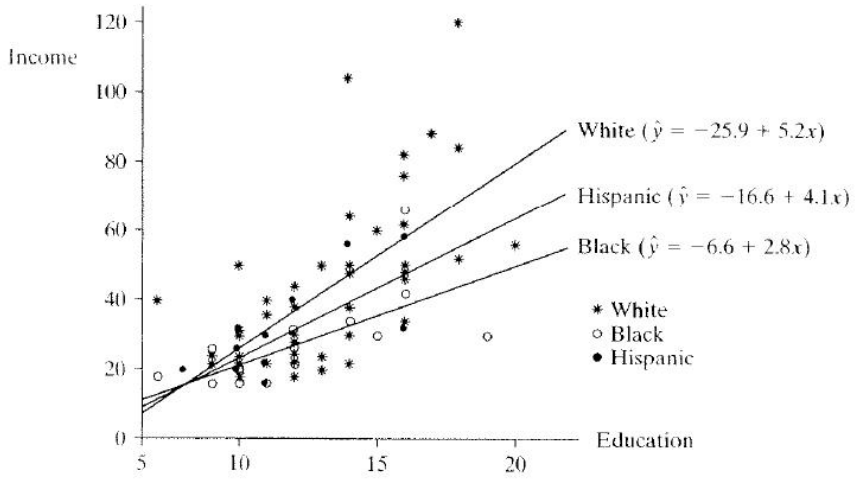


FIGURE 13.6: Plot of Prediction Equations for Model with Interaction Terms

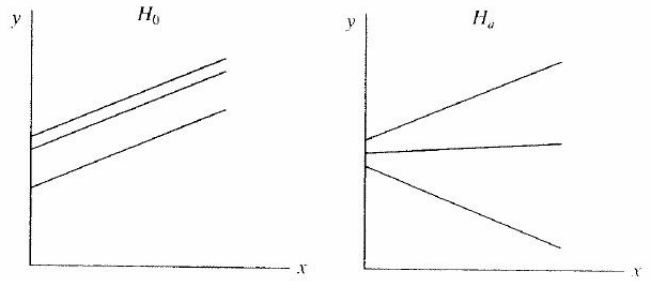


FIGURE 13.7: Graphical Representation of Null and Alternative Hypotheses in a Test of No Interaction, when the Categorical Predictor Has Three Categories

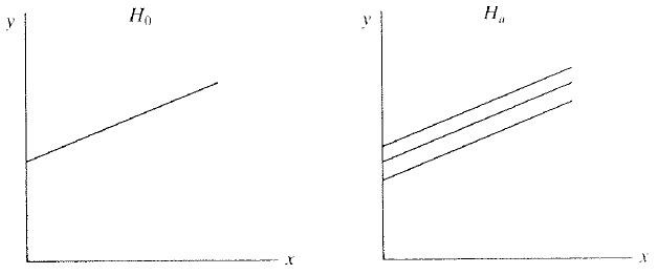


FIGURE 13.8: Graphical Representation of Null and Alternative Hypotheses in a Test of Equivalence of Regression Lines, when the Categorical Variable Has Three Categories (Test Assumes No Interaction)

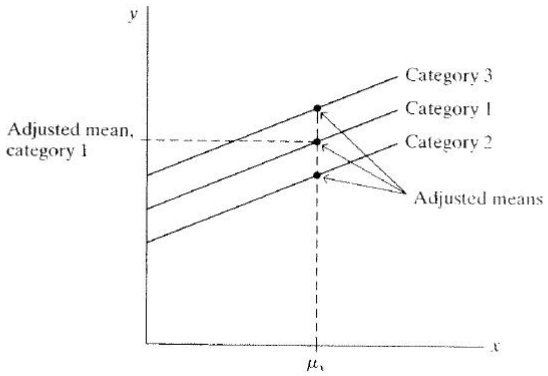


FIGURE 13.9: Population Adjusted Means, when a Categorical Explanatory Variable Has Three Categories

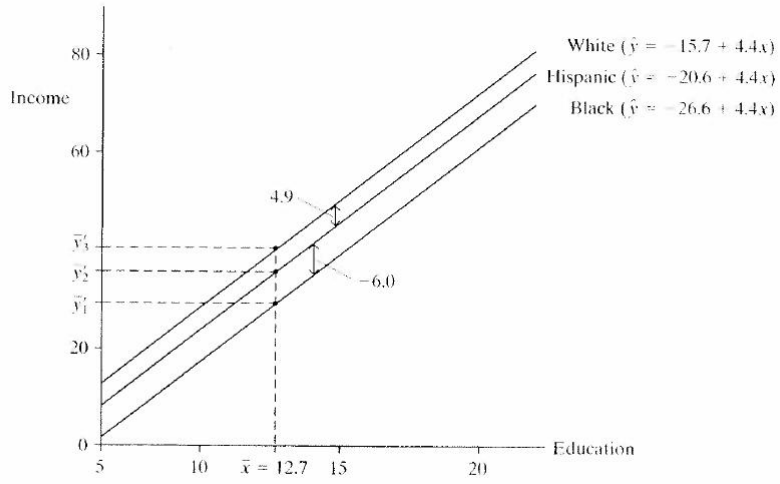


FIGURE 13.10: Sample Adjusted Means on Income, Controlling for Education, for Three Racial–Ethnic Groups

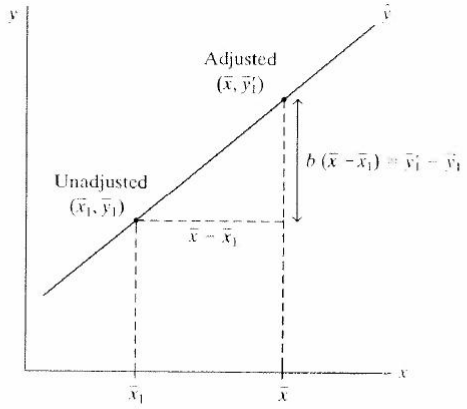


FIGURE 13.11: Graphical Depiction of Sample Adjusted and Unadjusted Means for the First Group. The ordinary mean is the predicted value at the mean of x for that group alone, whereas the adjusted mean is the predicted value at the mean $\bar{x}$ for all the data.

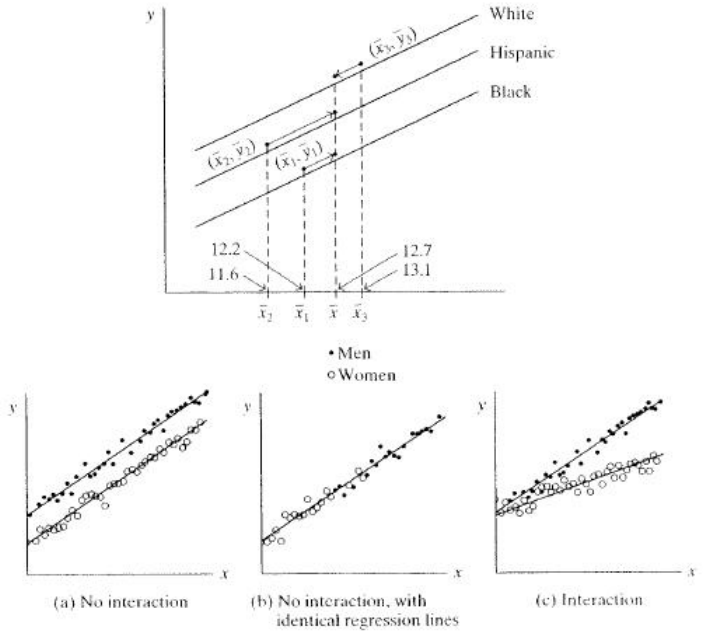


FIGURE 13.12: Adjustment Process for Income by Racial–Ethnic Group, Controlling for Education

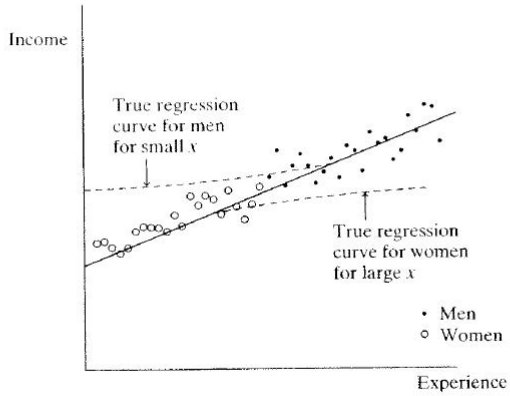


FIGURE 13.13: A Situation in Which Adjusted Means Are Misleading, Comparing Mean Incomes for Men and Women while Controlling for Experience

CAPITOLO 14

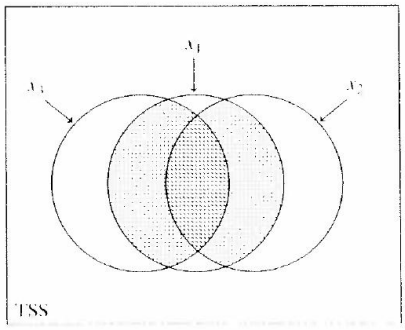


FIGURE 14.1: Variability in y Explained by x_1, x_2, and x_3. Shaded portion is amount explained by x_1 that is also explained by x_2 and x_3.

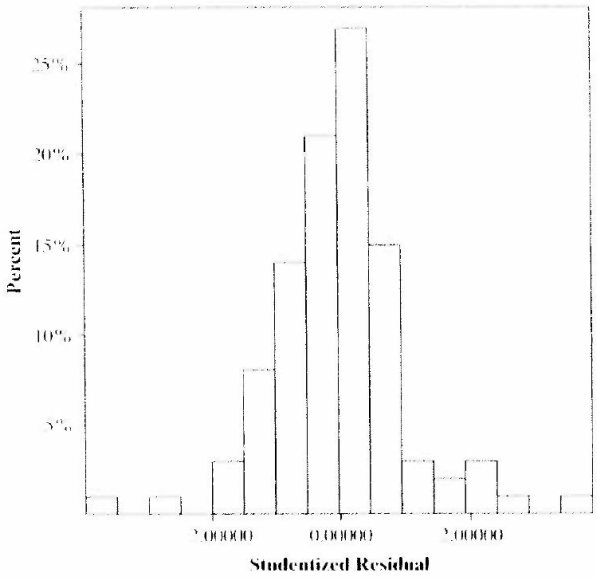
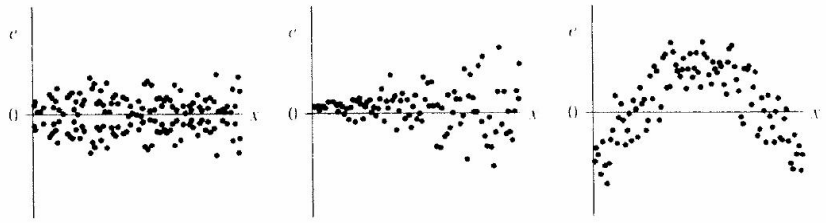


FIGURE 14.2: Histogram of Studentized Residuals for Multiple Regression Model Fitted to Housing Price Data, with Predictors Size, Taxes, and New



(a) Assumptions satisfied (b) Nonconstant standard deviation (c) Nonlinear term needed

FIGURE 14.3: Possible Patterns for Residuals (e), Plotted against an Explanatory Variable x

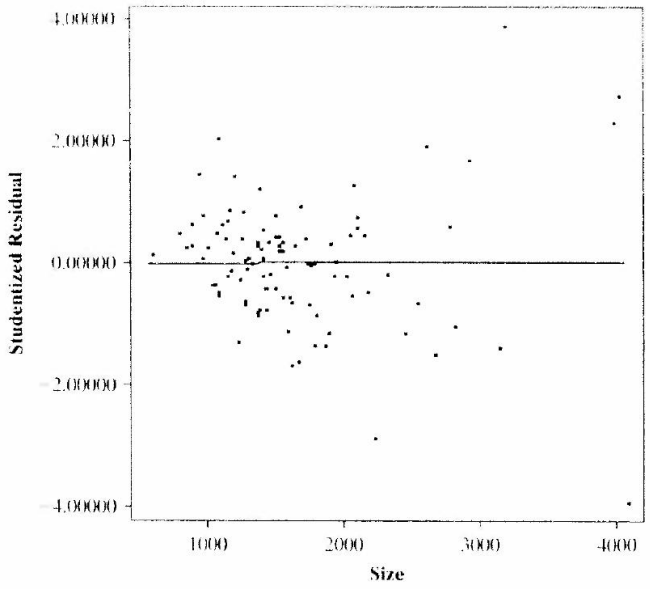


FIGURE 14.4: Scatterplot of Studentized Residuals of Home Selling Price Plotted against Size of Home, for Model with Predictors Size, Taxes, and Whether Home Is New

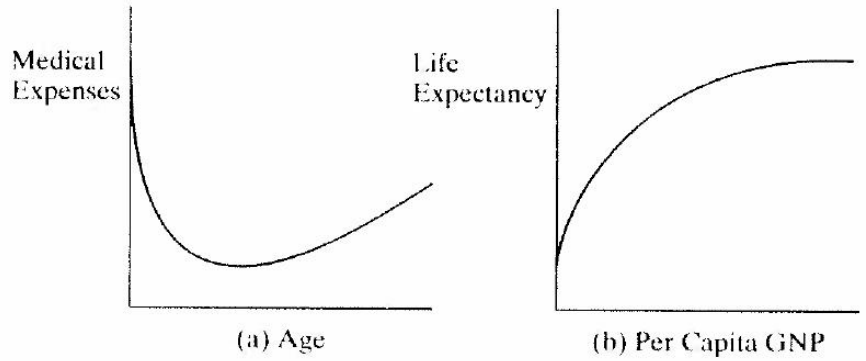


FIGURE 14.5: Two Nonlinear Relationships

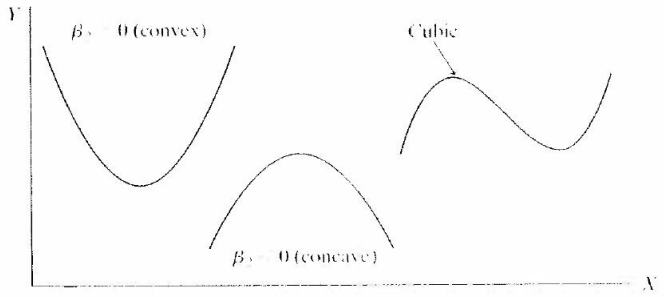


FIGURE 14.6: Graphs of Two Second-Degree Polynomials (Quadratic Functions) and a Third-Degree Polynomial (Cubic Function)

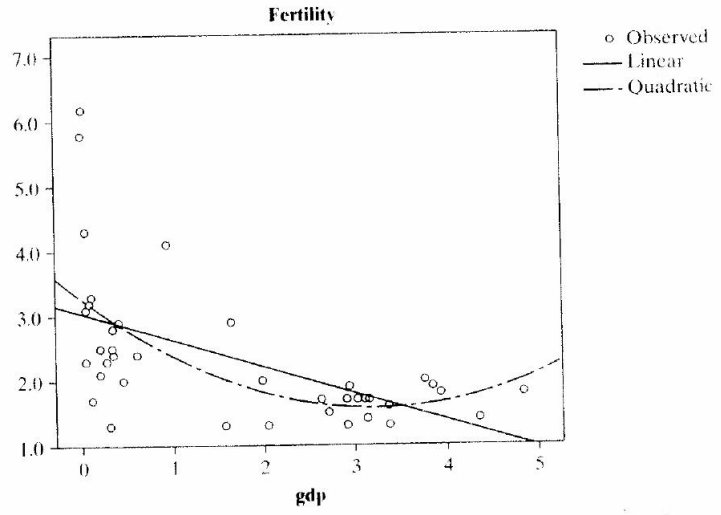


FIGURE 14.7: Scatterplot and Best-Fitting Straight Line and Second-Degree Polynomial for Data on Fertility Rate and Per Capita GDP

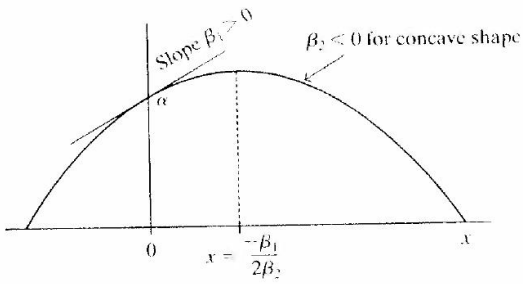


FIGURE 14.8: Interpretation of Parameters of Second-Degree Polynomial $E(y) = \alpha + \beta_1 x + \beta_2 x^2$

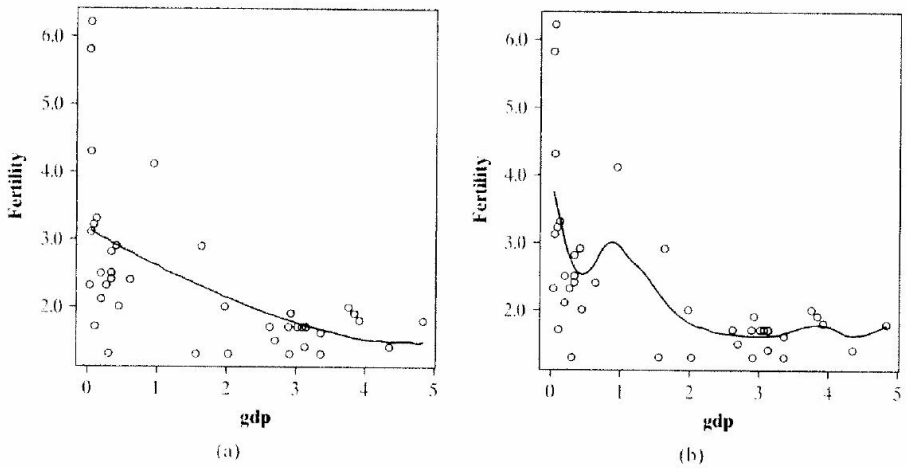


FIGURE 14.9: Fits of Nonparametric Regression Model to Smooth the Fertility Rate Data of Table 14.6. Fit (a) employs greater smoothing (bandwidth = 5 in SPSS) than fit (b) (bandwidth = 1 in SPSS).

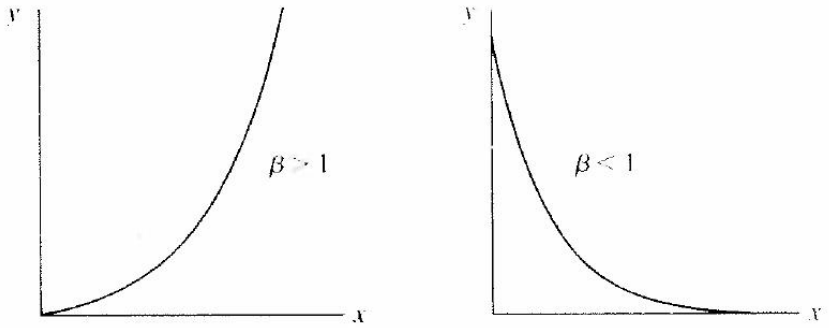


FIGURE 14.10: The Exponential Regression Function $E(y) = \alpha\beta^x$

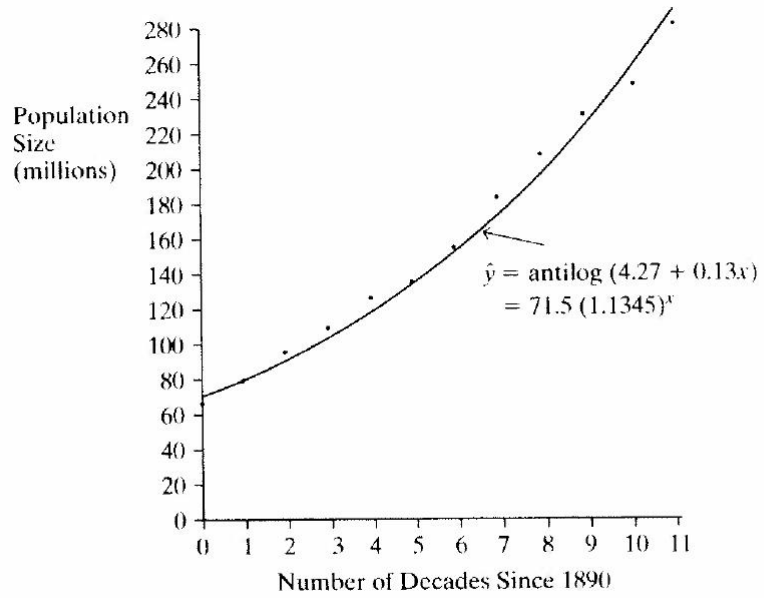


FIGURE 14.11: U.S. Population Size since 1890

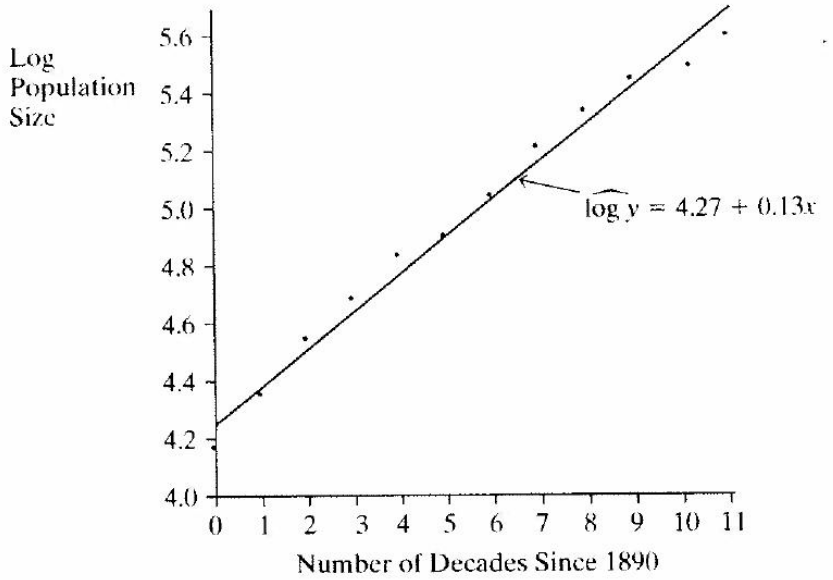


FIGURE 14.12: Log Population Sizes since 1890

CAPITOLO 15

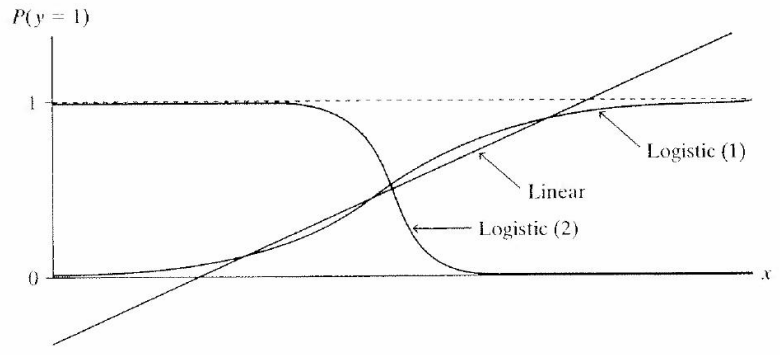


FIGURE 15.1: Linear and Logistic Regression Models for a (0, 1) Response, for which $E(y)$ Is $P(y = 1)$

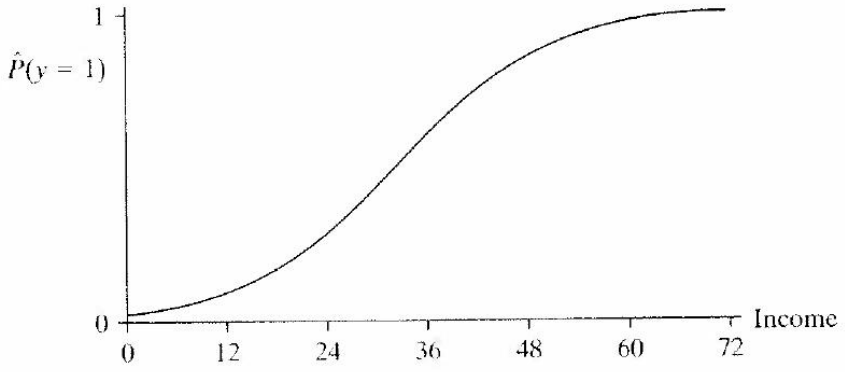


FIGURE 15.2: Logistic Regression Prediction Curve for Example 15.1

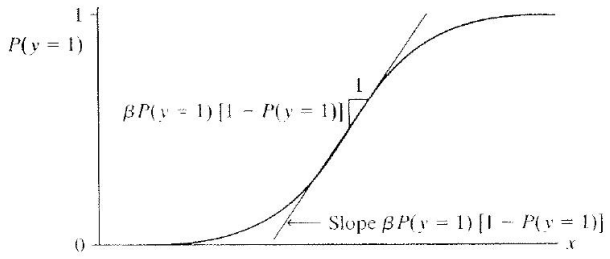


FIGURE 15.3: A Line Drawn Tangent to a Logistic Regression Curve Has Slope $\beta P(y = 1)[1 - P(y = 1)]$

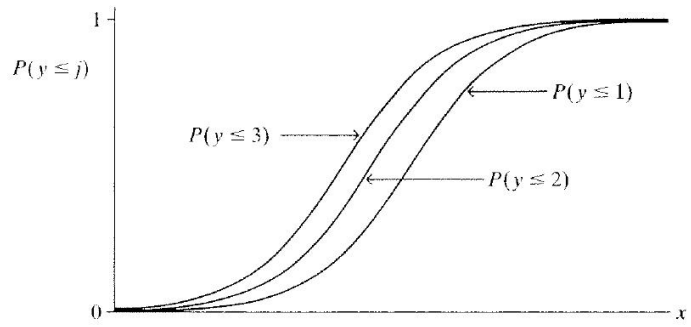


FIGURE 15.4: Depiction of Curves for Cumulative Probabilities in Cumulative Logit Model