

## Two-Way ANOVA EXAMPLES

### Description:

Subjects were students in grades 4-6 from three school districts in Ingham and Clinton Counties, Michigan. Chase and Dummer stratified their sample, selecting students from urban, suburban, and rural school districts with approximately 1/3 of their sample coming from each district. Students indicated whether good grades, athletic ability, or popularity was most important to them. They also ranked four factors: grades, sports, looks, and money, in order of their importance for popularity. The questionnaire also asked for gender, grade level, and other demographic information.

**Number of cases:** 372

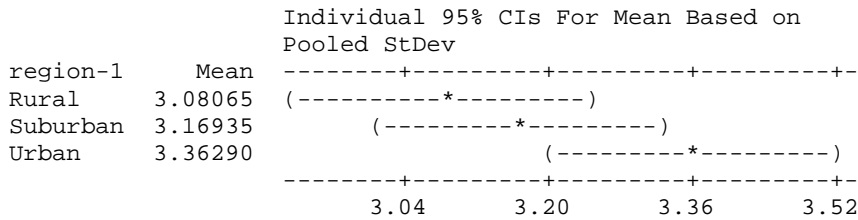
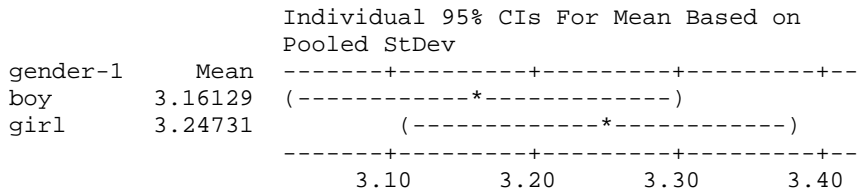
### Variable Names:

1. Gender: Boy or girl
2. Grade: 4, 5 or 6
3. Age: Age in years
4. Race: White, Other
5. Urban/Rural: Rural, Suburban, or Urban school district
6. School: Brentwood Elementary, Brentwood Middle, Ridge, Sand, Eureka, Brown, Main, Portage, Westdale Middle
7. Goals: Student's choice in the personal goals question where options were 1 = Make Good Grades, 2 = Be Popular, 3 = Be Good in Sports
8. Grades: Rank of "make good grades" (1=most important for popularity, 4=least important)
9. Sports: Rank of "being good at sports" (1=most important for popularity, 4=least important)
10. Looks: Rank of "being handsome or pretty" (1=most important for popularity, 4=least important)
11. Money: Rank of "having lots of money" (1=most important for popularity, 4=least important)

## Two-way ANOVA: Money versus gender-1, region-1

Source	DF	SS	MS	F	P
gender-1	1	0.688	0.68817	0.79	0.375
region-1	2	5.167	2.58333	2.96	0.053
Interaction	2	3.554	1.77688	2.04	0.132
Error	366	319.065	0.87176		
Total	371	328.473			

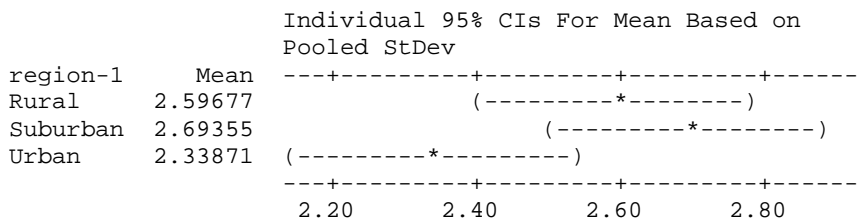
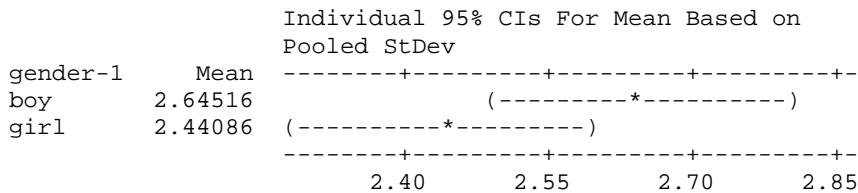
S = 0.9337 R-Sq = 2.86% R-Sq(adj) = 1.54%



## Two-way ANOVA: Grades versus gender-1, region-1

Source	DF	SS	MS	F	P
gender-1	1	3.882	3.88172	3.30	0.070
region-1	2	8.344	4.17204	3.55	0.030
Interaction	2	1.634	0.81720	0.69	0.500
Error	366	430.452	1.17610		
Total	371	444.312			

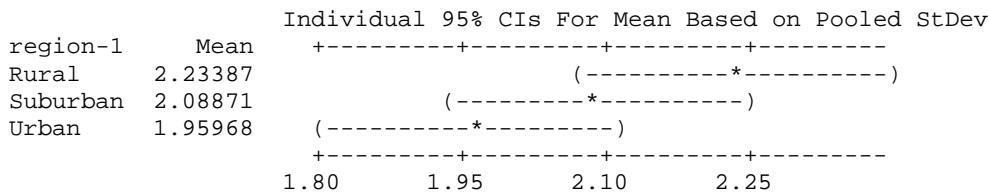
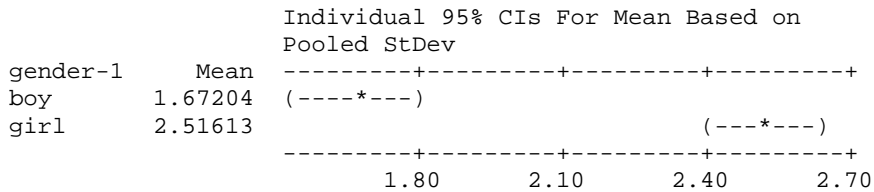
S = 1.084 R-Sq = 3.12% R-Sq(adj) = 1.80%



## Two-way ANOVA: Sports versus gender-1, region-1

Source	DF	SS	MS	F	P
gender-1	1	66.261	66.2608	81.95	0.000
region-1	2	4.667	2.3333	2.89	0.057
Interaction	2	2.860	1.4301	1.77	0.172
Error	366	295.919	0.8085		
Total	371	369.707			

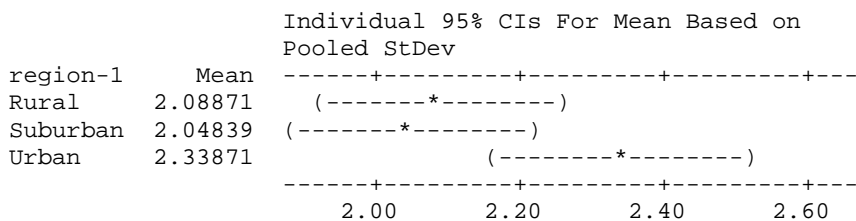
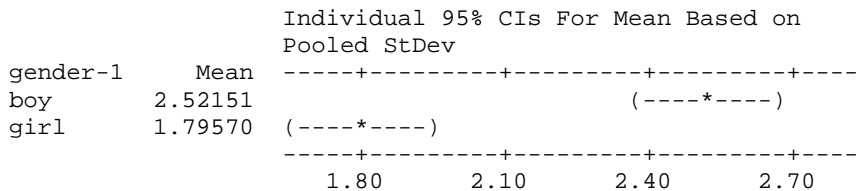
S = 0.8992 R-Sq = 19.96% R-Sq(adj) = 18.86%



## Two-way ANOVA: Looks versus gender-1, region-1

Source	DF	SS	MS	F	P
gender-1	1	48.992	48.9919	48.30	0.000
region-1	2	6.134	3.0672	3.02	0.050
Interaction	2	1.306	0.6532	0.64	0.526
Error	366	371.210	1.0142		
Total	371	427.642			

S = 1.007 R-Sq = 13.20% R-Sq(adj) = 12.01%



# Can “Low-Fat” Nutrition Labels Lead to Obesity?

BRIAN WANSINK and PIERRE CHANDON

JOURNAL OF MARKETING RESEARCH, NOVEMBER 2006

Study examines whether low-fat nutrition labels increase the actual consumption of hedonic chocolate candies by overweight and normal-weight consumers. To achieve this, we asked adult family members (53% males, 31 years old, 25.3 body mass index [BMI]) participating in a university open house to serve themselves unusual colors of M&M’s (gold, teal, purple, and white), which were clearly labeled either as “New Colors of Regular M&M’s” (regular-label condition) or as “New ‘Low-Fat’ M&M’s” (low-fat-label condition). We then measured how many calories of M&M’s they ate.

## Two-way ANOVA: Consumption versus BodyMass, Label

Source	DF	SS	MS	F	P
BodyMass	1	11458.2	11458.2	12.34	0.001
Label	1	35581.2	35581.2	38.32	0.000
Interaction	1	9030.0	9030.0	9.72	0.004
Error	36	33430.5	928.6		
Total	39	89500.0			

S = 30.47    R-Sq = 62.65%    R-Sq(adj) = 59.53%

	BodyMass	
Label	overweight	regular weight
“regular” m&m’s	Mean=191.6 Stdev=45.0 N= 10	Mean=187.80 Stdev=17.37 N=10
“low fat” m&m’s	Mean=281.3 Stdev=34.6 N=10	Mean=217.40 Stdev=13.56 N=10