

Homework 2

Analyze these data as completely as you can (i.e., is the homogeneity of variance assumption met in each case?). Are there overall effects? In the event of significant effects, track down the source of the effect by means of post hoc comparisons. Pay particular attention to the analysis and interpretation of interactions. At the very least, you should estimate effect size and power for the interaction effects. Good Luck!!

1. Pierroutsakos and DeLoache (2003) were interested in the development of pictorial competence in children. They use the term pictorial competence to “encompass the many factors that are involved in perceiving, interpreting, understanding, and using pictures (DeLoache, Pierroutsakos, & Uttal, 2003, p. 115).” These researchers observe infants as they explore pictures of familiar objects. Unlike adults, infants are not content to look at the pictures, but will typically attempt to manipulate the pictured object.

In the data depicted below, 9-month-old infants were shown photographs and line drawings of familiar objects. The photographs and line drawings were either in black-and-white or in color. The dependent variable is the number of manual behaviors the infant exhibits toward the picture. Complete the following source table, which depicts results consistent with those of Pierroutsakos and DeLoache, and then analyze the results as completely as you can. Make an effort to interpret the results as you would in a Discussion section.

Descriptive Statistics

Dependent Variable: Manual Behav

Pict Type	Color	Mean	Std. Deviation	N
Drawing	B&W	.9000	.56765	10
	Color	2.7000	.94868	10
	Total	1.8000	1.19649	20
Photo	B&W	3.0000	.81650	10
	Color	5.0000	.81650	10
	Total	4.0000	1.29777	20
Total	B&W	1.9500	1.27630	20
	Color	3.8500	1.46089	20
	Total	2.9000	1.66102	40

Levene's Test of Equality of Error Variances^a

Dependent Variable: Manual Behav

F	df1	df2	Sig.
1.122	3	36	.353

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + PictType + Color + PictType * Color

Tests of Between-Subjects Effects

Dependent Variable: Manual Behav

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
PictType	48.4				.000	.678	75.757	1.000
Color	36.1				.000	.611	56.504	1.000
PictType * Color					.695	.004	.157	.067
Error								
Corrected Total	107.6							

2. [Howell] In a study of memory processes, animals were presented with a one-trial avoidance task. As soon as they stepped across a line down the center of their cage they were shocked (through the floor of the cage). Three groups of animals differed in the area in which they had electrode implants in their brains (Neutral Site, Area A, or Area B). Each group was further divided and given electrical stimulation either 50, 100, or 150 milliseconds after crossing the line and receiving the foot shock. If the brain area stimulated *is* involved in memory, stimulation would be expected to interfere with consolidation of the memory and retard learning of the avoidance response. The DV was the number of seconds it took the animal to cross the line on the second trial (so smaller numbers indicate that the brain stimulation caused the animals to forget that they had been previously shocked when they crossed the line).

NEUTRAL SITE			AREA A			AREA B		
50ms	100ms	150ms	50ms	100ms	150ms	50ms	100ms	150ms
25	30	28	11	31	23	23	18	28
30	25	31	18	20	28	30	24	21
28	27	26	26	22	35	18	9	30
40	35	20	15	23	27	28	16	30
20	23	35	14	19	21	23	13	23

3. An experiment is done to test the effect of age and dress of a speaker on attitude of a college audience. Groups of college students listen to a person speak about why Slabotnik should be president. The speaker is either formally dressed (tie and jacket) or casually dressed (blue jeans and t-shirt). Additionally, the speaker is either in his 20's, 30's, or 40's. After the talk, the subjects rate their attitude about whether Slabotnik should be elected, on a scale ranging from 0 (should not be elected) to 7 (should be elected).

FORMAL			CASUAL		
20's	30's	40's	20's	30's	40's
0	1	3	5	3	1
1	1	2	4	2	0
0	2	3	3	3	1
2	2	2	4	3	2
1	1	4	6	4	2
0	2	3	5	4	1

4. Schachter, Christenfeld, Ravina and Bilous (1991) studied the presence of speech fillers (um, ah,...) in faculty from different disciplines (Natural Science, Social Science, and Humanities). [You should note that this factor is a non-manipulated participant characteristic.] Schachter et al. thought that when lecturing in a classroom setting, faculty in more "precise" disciplines would be inclined to use fewer fillers. However, when being interviewed (e.g., about their ongoing work with graduate students), Schachter et al. thought that there would be little difference among the faculty. (What are they predicting will occur in their ANOVA?) Below is a little data set that would be consistent with the results they obtained. Analyze these data as completely as you can.

Lecture			Interview		
Nat Sci	Soc Sci	Hum	Nat Sci	Soc Sci	Hum
1	4	4	5	4	5
2	4	5	5	5	5
1	4	4	5	5	6
1	5	5	6	5	5
2	4	5	6	5	6

5. [Howell] In a study of mother-infant interaction, mothers are rated by trained observers on the quality of their interactions with their infants. Mothers were classified on the basis of whether or not this was their first child (primiparous) or not (multiparous). In addition, subjects were classified as to whether the infant was below normal in birth weight and the mother was less than 18 years of age (LBW<18), whether the infant was below normal weight and the mother was greater than 18 years of age (LBW>18), and finally, if the child was full-term (FT). The DV was a 12-point scale, where a high score indicates better interaction between mother and infant. Below are the data.

PRIMIPAROUS			MULTIPAROUS		
LB<18	LB>18	FT	LB<18	LB>18	FT
4	6	8	3	7	9
6	5	7	4	8	8
5	5	7	3	8	9
3	4	6	3	9	9
3	9	7	6	8	3
7	6	2	7	2	10
4	2	5	1	1	9
5	6	8	4	9	8
4	5	7	4	9	7
4	5	7	4	8	10