Exam 3 PS 306, Spring 2005

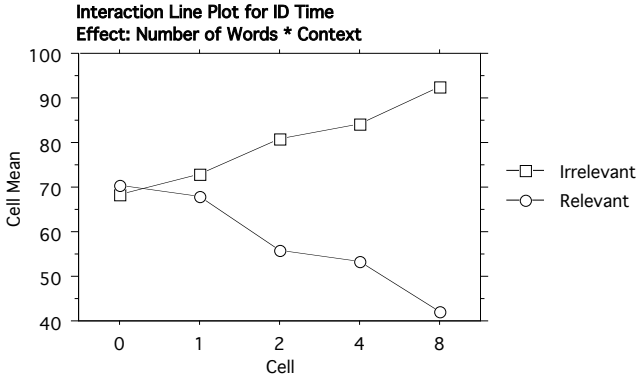
1. In a classic study, Tulving and Gold (1963) studied word identification under conditions of amounts of relevant and irrelevant context. Let's conceive of their study as a 2x5 independent groups design, with Context (Relevant vs. Irrelevant) and Number of Words (0, 1, 2, 4, and 8) as the two factors. For the very briefly presented target word *performer*, for instance, some participants would see no preceding words (0) or the first 1, 2, 4, or 8 words from one of two sentences. The Relevant sentence was "The actress received praise for being an outstanding..." The Irrelevant sentence was "The dog retrieved the burrito from the neighbor's..." Obviously, the issue was the extent to which the preceding context would help the participant to identify the target word that was presented very briefly. The dependent variable was the time it took the participant to identify the target word. Complete the source table below and analyze the data as completely as you can, providing an interpretation for the obtained results. [15 pts]

ANOVA Table for ID Time

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Number of Words	4	132.467	33.117	3.375	.0120	13.500	.841
Context	1	14344.533	14344.533	1461.920	<.0001	1461.920	1.000
Number of Words * Context	4	10560.467	2640.117	269.067	<.0001	1076.267	1.000
Residual	110	1079.333	9.812				

Means Table for ID Time
Effect: Number of Words * Context

	Count	Mean	Std. Dev.	Std. Err.
0, Irrelevant	12	68.333	3.200	.924
0, Relevant	12	70.500	3.989	1.151
1, Irrelevant	12	73.083	2.314	.668
1, Relevant	12	67.917	2.778	.802
2, Irrelevant	12	80.917	3.147	.908
2, Relevant	12	55.917	3.679	1.062
4, Irrelevant	12	84.333	2.964	.856
4, Relevant	12	53.333	3.025	.873
8, Irrelevant	12	92.500	3.425	.989
8, Relevant	12	42.167	2.406	.694



There is a main effect for Number of Words, $F(4,110) = 3.375$, $MSE = 9.812$, $p = .01$. There is also a main effect for Context, $F(1,110) = 1461.92$, $MSE = 9.812$, $p < .001$. There is also a significant interaction, $F(4,110) = 269.067$, $MSE = 9.812$, $p < .001$. Thus, you should focus your attention on interpreting the interaction. To do so, first compute HSD:

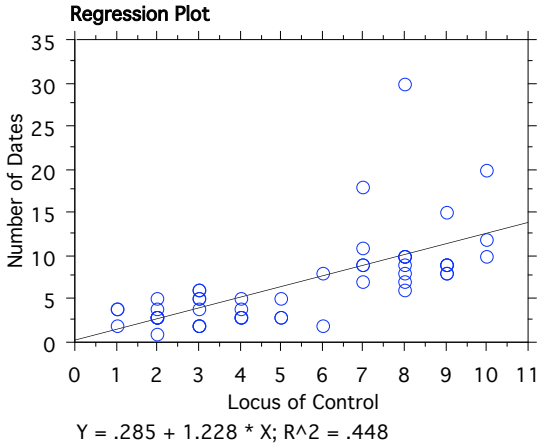
$$HSD = 4.57\sqrt{\frac{9.812}{12}} = 4.13$$

Thus, with a Context of 0 words, there is no difference between the impact of a relevant ($M = 70.5$) or irrelevant sentence ($M = 68.33$) (after all, the sentence wasn't even seen). However, with a Context of 1, 2, 4, or 8 words, people took significantly longer to identify the word when the sentence was irrelevant than when the sentence was relevant. Moreover, the magnitude of that difference grew as the number of contextual words increased.

2. Dr. Sally Forth is interested in studying the relationship between Locus of Control (a measure developed by Dr. Julian Rotter, with some people more Internal and some people more External) and the number of different people that a person has dated. She hypothesized that there would be a positive linear relationship between locus of control and the variety of a person's dating partners (higher locus of control leading to greater number of different people dated). Dr. Forth collected data from 50 college students on her scale of Locus of Control (0 = *External* and 10 = *Internal*). Interpret her results (seen below) as completely as you can. If a person had a Locus of Control score of 7, what would be your best estimate of the number of different people that person would have dated? If a person had a Locus of Control score of 12, what would be your best estimate of the number of different people that person would have dated? Be very explicit in telling me why you would not be willing to accept the conclusion that one's Locus of Control affected the number of different people one would have dated. [10 pts]

Regression Summary
Number of Dates vs. Locus of Control

Count	50
Num. Missing	0
R	.669
R Squared	.448
Adjusted R Squared	.436
RMS Residual	3.957



Y = .285 + 1.228 * X; R^2 = .448

ANOVA Table
Number of Dates vs. Locus of Control

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	609.318	609.318	38.918	<.0001
Residual	48	751.502	15.656		
Total	49	1360.820			

Regression Coefficients
Number of Dates vs. Locus of Control

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.285	1.205	.285	.237	.8138
Locus of Control	1.228	.197	.669	6.238	<.0001

There is a significant positive linear relationship between a person's locus of control and the number of dates that person has had, $r(48) = .669$, $p < .001$. The two variables share 45% of their variance ($r^2 = .448$). If a person had a locus of control score of 7, that person's number of dates would be 8.88 (roughly 9). If a person had a locus of control score of 12, you would be in an ambiguous situation, given that you had not observed anyone with a locus of control score that high. You could either decide that you were uncomfortable making such a prediction. Or, alternatively, you could say that if the trend continued, you would predict 15 dates.

You would be uncomfortable making causal claims, because it may well be the case that people who have more dates develop a more internal locus of control and people who have fewer dates develop a more external locus of control (the causal arrow problem). Alternatively, for example, it may be that people who come from larger families may develop both an external locus of control and be more likely to have more dates (the third variable problem).

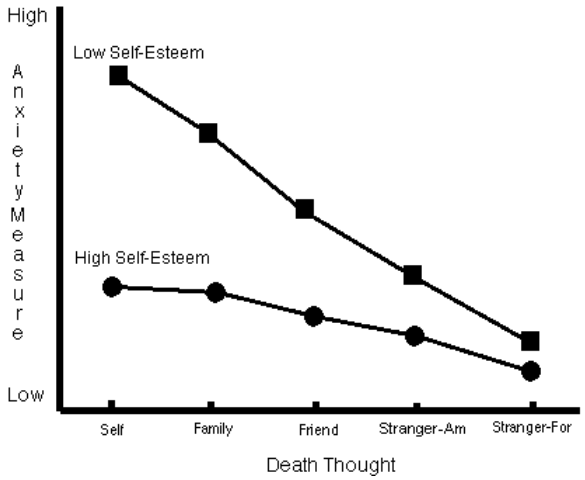
3a. Several researchers, including Sheldon Solomon, are interested in the potential role of self-esteem. (Sheldon sees self-esteem as a buffer against the ills of the world, like fear of death.) Suppose that you are interested in studying the effects of self-esteem on anxiety. To that end, you assess participants' self-esteem and select a group of people with Low Self-Esteem and an equal group of people with High Self-Esteem. (Thus, this variable is not manipulated.) Suppose that you are also interested in the effects of thinking about your own death (as Sheldon often does in his studies). To that end, you plan to have a second independent variable in which participants are asked to think about (1) their own death, (2) the death of a member of their immediate family (e.g., father, mother, sibling), (3) the death of a classmate who is a friend, (4) the death of a stranger who is also American, and (5) the death of a stranger who is a foreigner. You decide to use a physiological measure of anxiety, so your dependent variable is a combination of heart-rate, galvanic skin response (GSR), and blood pressure—all of which can be tracked in real time to assess anxiety levels (higher physiological response indicates higher anxiety). You produce vignettes describing each of the "death" conditions, which you will administer to each participant as a repeated factor. Thus, your study is a 2x5 mixed design. Tell me in a fair amount of detail how you would actually conduct your experiment. [20 pts]

To produce a reasonable amount of power, I'd shoot for roughly 30 participants per condition. With a repeated measures factor with five levels, I'd probably use incomplete counterbalancing, so I'd produce 10 orders of the repeated measures factor. I'd use the digram balanced approach, so I'd get orders like: 1,2,5,3,4; 4,3,5,2,1; 2,3,1,4,5; 5,4,1,3,2; 3,4,2,5,1; 1,5,2,4,3; 4,5,3,1,2; 2,1,3,5,4; 5,1,4,2,3; and 3,2,4,1,5 (where 1 = own death, etc.). Thus, I'd need 30 people who were high in self-esteem and 30 people who were low in self-esteem. Presumably, that assessment was done prior to the experiment and I can trust that people were properly assigned to the low- and high-self-esteem groups.

As each participant arrived, I would have her or him complete an informed consent form that briefly described the study. I would then hook up the participant to the physiological recording equipment. I would have the participant sit comfortably for a while and take baseline measurements. I might have the participant read some non-death-related material while establishing the baseline (to ensure that arousal isn't due to reading *per se*). Then I would have the participant read the first vignette, then take a break and relax for a brief while (until the physiological recordings returned to baseline), then read the second vignette, etc. After reading the last vignette and returning to baseline, I would debrief and dismiss the participant.

The experimenter should be blind to the nature of the participants (i.e., wouldn't know which were low or high self-esteem) as well as to the nature of the specific order of vignettes given to the participants. Doing so would minimize any impact of the experimenter on the data.

3b. In the graph below, illustrate the results you anticipate you would find in such a study, then tell me what effects you expect to be found in the data you've provided and how you'd interpret such results. [10 pts]



Main Effect for Death Thought Yes/No Why? **Yes. Self > Family > Friend > Stranger-Am > Stranger-For**

Main Effect for Self-Esteem Yes/No Why? **Yes. Low Self-Esteem > High Self-Esteem**

Interaction Yes/No Why? **Yes. Lines are not parallel. People with low self-esteem are more anxious than people with high self-esteem when thinking about the death of self, family member, friend, and a stranger who is an American. However, when thinking about the death of a foreign stranger, there is little difference between people with low and high self-esteem.**

Interpretation: **It appears that simply thinking of death is not sufficient to produce anxiety (otherwise there would have been no interaction). Instead, it seems that thinking of one's own demise leads to greater anxiety among people with low self-esteem (because their "buffer" is not that strong) than among people with high self-esteem. Moreover, thinking of death alone does not cause anxiety, because if the death is of a person who is not close to you, then little anxiety ensues.**

4. In the assessment of human research, people rely on the APA ethical guidelines. Briefly outline the guidelines relevant to assessing human research. Using those guidelines, would you have approved the West, Gunn, and Chernicky (1975) study about the impact of situational variables on the willingness of participants to commit a crime (burglary)? [10 pts]

Here, you would use the APA Guidelines (Ch. 14) to examine the West et al. study (also Ch. 14).

5. What are the principles that Fine and Kurdek argue one should use in determining whether or not a student should be listed as an author of a journal article? How are they defined? [5 pts]

Here, you would use the Fine and Kurdek article to illustrate the three principles.

6. Suppose that you are interested in designing some studies such that they would have sufficient power to detect differences. To that end, you would like to have 50 scores in each condition. For the designs below, how many participants would you need? [5 pts]

Design	Number of Participants
A 5x6 completely independent groups (between) design.	**1500**
A 5x6 completely repeated measures (within) design.	**60**
A 5x6 mixed design with the first factor between.	**270**
A 5x6 mixed design with the second factor between.	**300**
A 5x5 completely repeated measures design.	**50**

7. When a stimulus is presented continuously and it does not vary in intensity, the individual will eventually perceive the stimulus as less intense or not perceive it at all. This phenomenon is known as sensory adaptation. Years ago, Zigler (1932) studied adaptation for skin (cutaneous) sensation by placing a small weight on part of the body and measuring how much time elapsed until participants reported that they felt nothing at all. Suppose that a researcher does a similar study, comparing adaptation for 4 regions of the body. A 500-mg weight is placed on the region, and the latency (in seconds) for a report that it is no longer felt is recorded for each participant. Complete the following source table and analyze the results from this experiment as completely as you can. [15 pts]

ANOVA Table for Area of Stimulation

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject	6	13.915	2.319				
Category for Area of Stimulation	3	225.967	75.322	214.841	<.0001	644.523	1.000
Category for Area of Stimulation * Subject	18	6.311	.351				

Means Table for Area of Stimulation
Effect: Category for Area of Stimulation

	Count	Mean	Std. Dev.	Std. Err.
Back of Hand	7	5.986	1.022	.386
Lower Back	7	4.129	.588	.222
Middle of Palm	7	9.371	1.083	.409
Chin	7	11.414	.899	.340

There is a significant effect of the place on the body on which the weight was placed, $F(3,18) = 214.841$, $MSE = .351$, $p < .001$. To determine which particular places differ, you need to compute HSD:

$$HSD = 4.0\sqrt{\frac{.351}{7}} = 0.896$$

Thus, people take longer to adapt to the weight when placed on the chin compared to all other locations, longer for the middle of the palm than the other areas (back of hand and lower back), and longer for the back of the hand than the lower back. Thus, our lower backs are not particularly sensitive and our chins are fairly sensitive.

8. Describe one experiment used by Rosenthal to argue for the presence of experimenter expectancy effects. [5 pts]

Notes from class will enable you to respond to this question.

9. What are demand characteristics? How did Martin Orne study such demand characteristics in the study of sensory deprivation or hypnosis (as discussed in your text)? [5 pts]

Notes from class and a careful reading of your text will enable you to respond to this question.