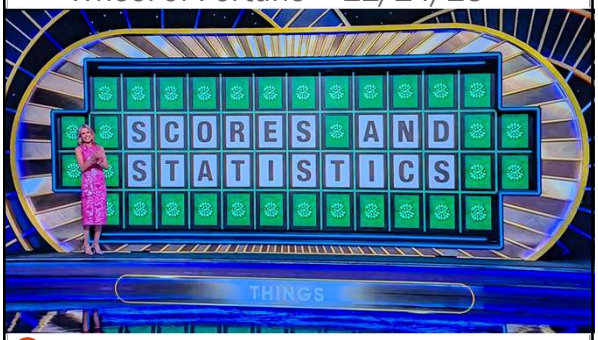
Wheel of Fortune – 11/24/25



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Admin Format Percentages Bivariate Threeway Wrapup

OUTLINE

- **Reminders/Admin**
  - Semester wind-down
  - HW9 hints
  - Grade distributions
- **Volunteer Exercise** (get ready, some of you! ☺)
- **Introduction to Crosstabulation**
  - aka Cross-classification, Xtabs, 2ways, etc.
- **Lots of examples, today & next week** (SPSS, memes, *et al*)
- **Group Lab Exercise**

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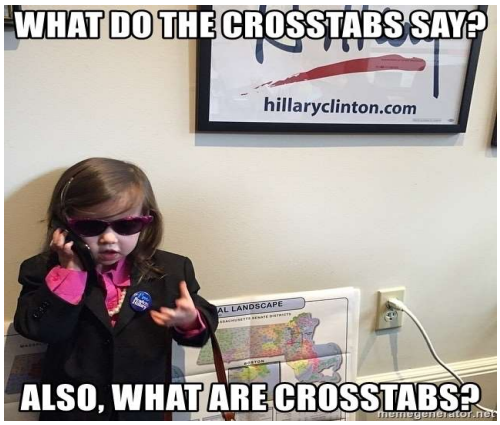

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What's Left...

- 3 more lectures, 4 more labs…

Date	Lecture	Lab
Tue Nov 25	Crosstabs	Crosstabs (any data; no interval vars)
Tues Dec 2	Dependence	Chi-square (*same* data & vars) Extra Credit: Reality shows
Thu Dec 4	Association	Extra Credit: MOAs
Tue Dec 9 & Thu Dec 11	Work session – • No new readings, lectures, quizzes, labs, etc. • Attendance not weighed in grade • Instructor available all day (as always) for *any*thing	

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SOC424 – Statistics w/ Dr. Ellis Godard

"CROSSTABS"

aka crosstabulations, xtabs, contingency tables, two-way tables, comparison tables, conditional tables, cross-tables, et al.

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HW9 Hints for Extra Credit...

- **Third Variables**
  - Third box
  - = Control variable
  - Intentionally before Elaboration lecture
- **Five missing values**
  - SPSS gives options to ID 1, 2, or 3 missing values, or *one series* (e.g. -1 to -3, or 97 to 99) plus 1 more
  - If a variable has *two nonconsecutive* series (e.g.: -1 & -2, 98 & 99):
    - You could recode one or more series to reduce # (don't!)
    - You could ignore any values that have no cases in your sample (check!!)

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Volunteer Exercise

- Request
- ID
- "Task"
- Summarize

On board…

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Fall 2025 lecture example

	Camera	No Cam.	
Vol.	2 100%	6 18%	8 23%
Didnt	0 0%	27 82%	27 77%
	2	33	

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Organization of Crosstabs

- Elementary parts
  - Each row is a value of the DV ("effect")
  - Each column is a value of the IV ("cause")
  - Each intersection (cell) is the combination of values of that row and that column
- Summary elements
  - The "row totals" (the "marginals") are just the frequency distribution of the DV, for all cases
  - Each column is just the frequency distribution of the DV, for a particular value of the IV
    - Think about using "select if" to look at males and females separately, and getting a frequency distribution for each one

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Spring 2025 lecture example

	Camera	No Cam.	
Vol.	0 (0%)	7 (19.5%)	7 (18.5%)
Didnt	1 (100%)	29 (80.5%)	30 (81.5%)
	1	36	n=37

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Examining Crosstabulations

- Always do these:
  - Compare *percentages*, not raw frequencies
  - Compare *across*, not up & down (which just uses one column, always just adds to 100%, and doesn't involve variation in the IV)
  - Look for the "modal percentages" (the largest percent) in each row (*not* column)
    - Do they fall on the "main diagonal", the line of cells predicted by your research hypothesis?
- Might also do these:
  - Compare each column to the marginals
  - Compare each column to a reference group
    - Could be one particular column, or another sample, or even another variable *(e.g. those absent)*

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Fall 2024 lecture example

	on camara	no on camera	
did volunteer	6 100%	5 15%	11 21%
didnt	0 0%	29 85%	29 79%

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Fall 2023 lecture example

did volunteer	on camara	no on camera	
	1	1	2
	100%	3%	
didnt	0	31	31
	0%	97%	
	1	32	33

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Spring 2021 lecture example

did volunteer	on camara	no on camera	
	2	5	7
	(66%)	(12%)	(15%)
didnt	1	38	39
	(33%)	(88%)	(85%)
	3	43	

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Spring 2023 lecture example

did volunteer	on camara	no on camera	
	2	3	5
	(33%)	(7.5%)	(12.4%)
didnt	4	37	41
	(66%)	(92.5)	(87.6%)
			46

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Compare %s, not Counts

- Raw frequencies (numbers of cases) can be misleading
  - Especially since we want to **compare across rows**
- Instead, use percentages
  - but make sure to **use column percents** and not row percents

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Summer 2021 lecture example

did volunteer	on camara	no on camera	
	1	3	
	(25%)	(23%)	(24%)
didnt	3	10	
	(75%)	(77%)	(76%)
	4	13	

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Here. 17 is more than 8...

The Nonequivalence of High School Graduates: Educational Attainment and Employment Status at Age 25

	High School Dropout	GED	High School Graduate	
Jobless	17	8	31	56
Employed	267	106	1435	1808
	284	114	1466	1864

Source: NLSY, analyzed by Cameron and Heckman 1991.

- Suggests that dropouts more often jobless than those w/ a GED
- But there are more than twice as many dropouts (vs. GED respondents) in the sample! **ONLY COMPARE PERCENTS!!**

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...but percents show the reverse

The Nonequivalence of High School Graduates:
Educational Attainment and Employment Status at Age 25

	High School Dropout	GED	High School Graduate	
Jobless	17 6.0% E=8.53	8 7.0%	31 2.1%	56 3.0%
Employed	267 94.0% E=275.46	106 93.0%	1435 97.9%	1808 97.0%
	284 15.3%	114 6.1%	1466 78.6%	1864

Source: NLSY, analyzed by Cameron and Heckman 1991.

- Those w/ GED slightly *more* likely to be jobless
  - Probably not a statistically significant difference

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What is the Relationship Between Obedience and Education?

BOOO!!! NOOOO!!!!

Count (Row Percent)	Obeying is Most Important: Yes	No	Row Total
Education: 0-11Yrs	74 (34.4)	141 (65.6)	215 (22.0)
Education: 12+Yrs	120 (15.7)	643 (84.3)	763 (78.0)
Column Total	194 (80.2)	748 (19.8)	978 (100.0)

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What is the Relationship Between Obedience and Education?

1. **Individuals who value obedience above all may have more difficulty developing self-direction required for advanced learning, thus increasing their dropout rates (obedience is IV, dropping out is DV)**
2. Individuals who drop out of school are more likely to occupy a subordinate position at work, where obedience is valued (reversed)
3. Older respondents are both more likely to value obedience and more likely to have not finished high school (third variable)

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Use Column Percents Instead!

Bruh, this one... don't make it hard ☺

Count (Column Percent)	Obeying is Most Important: Yes	No	Row Total
Education: 0-11Yrs	74 (38.1)	141 (18.0)	215 (22.0)
Education: 12+Yrs	120 (61.9)	643 (82.0)	763 (78.0)
Column Total	194 (80.2)	748 (19.8)	978 (100.0)

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A 2x2 Table (counts only)

Uh-oh... Something's missing! ☹

		Obeying is Most Important: Yes	No	Row Total
Education	0-11Yrs	74	141	215
	12+Yrs	120	643	763
Column Total		194	748	978

Source: 1991 GSS.

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HAPPY General Happiness by REGION Region of the United States

Some differences...

HAPPY	Count / Col Pct	REGION: North East (1)	South East (2)	West (3)	Row Total
1 Very Happy	Count	185	149	133	467
	Col Pct	27.5	36.3	31.7	31.1
2 Pretty Happy	Count	412	215	245	872
	Col Pct	61.2	52.3	58.3	58.0
3 Not Too Happy	Count	76	47	42	165
	Col Pct	11.3	11.4	10.0	11.0
Column Total	Count	673	411	420	1504
	Total	44.7	27.3	27.9	100.0

Page 1 of 1

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Statistics (HAPPY by REGION)

Significant, because p < .05

This is the test (but that's the next lecture.)

This is the test statistic

This is the p value

Chi-Square	Value	DF	Significance
Pearson	10.39295	4	.03430
Likelihood R	10.38473	4	.03442
Mantel-Haenszel linear association	2.69448		.10070

Minimum Expected Frequency - 45.090

HAPPY General Happiness by REGION Controlling for..
RACE Race of Respondent Value = 1 White

Differs for whites...

		REGION			Page 1 of 1
	Count				
	Col Pct	North Ea	South Ea	West	
		st	st		Row
HAPPY		1	2	3	Total
Very Happy	1	162	123	124	409
		28.0	40.5	33.2	32.6
Pretty Happy	2	361	150	219	730
		62.5	49.3	58.6	58.1
Not Too Happy	3	55	31	31	117
		9.5	10.2	8.3	9.3
Column Total		578	304	374	1256
		46.0	24.2	29.8	100.0

General Happiness by RACE

Varies by race...

		RACE			Page 1 of 1
	Count				
	Col Pct	White	Black	Other	
					Row
HAPPY		1	2	3	Total
Very Happy	1	409	46	12	467
		32.6	22.9	25.5	31.1
Pretty Happy	2	730	116	26	872
		58.1	57.7	55.3	58.0
Not Too Happy	3	117	39	9	165
		9.3	19.4	19.1	11.0
Column Total		1256	201	47	1504
		83.5	13.4	3.1	100.0

Strong Association for Whites

Very significant...

Chi-Square	Value	DF	Significance
Pearson	16.12853	4	.00285
Likelihood Ratio	16.07367	4	.00292
Mantel-Haenszel linear association	3.33124	1	.06798

SPSS Output

VERY significant...

Chi-Square	Value	DF	Significance
Pearson	24.79683	4	.00006
Likelihood Ratio	22.44551	4	.00016
Mantel-Haenszel	16.98205	1	.00004

Minimum Expected Frequency - 5.156

HAPPY General Happiness by REGION Region of the United States Controlling for..
RACE Race of Respondent Value = 2 Black

Not for blacks

		REGION			Page 1 of 1
	Count				
	Col Pct	North Ea	South Ea	West	
		st	st		Row
HAPPY		1	2	3	Total
Very Happy	1	18	23	5	46
		22.2	24.7	18.5	22.9
Pretty Happy	2	44	56	16	116
		54.3	60.2	59.3	57.7
Not Too Happy	3	19	14	6	39
		23.5	15.1	22.2	19.4
Column Total		81	93	27	201
		40.3	46.3	13.4	100.0

No Association for Blacks

And not significant!

Chi-Square	Value	DF	Significance
Pearson	2.35582	4	.67063
Likelihood Ratio	2.39818	4	.66296
Mantel-Haenszel	.08926	1	.76512

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I understand crosstabs.

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree

THUMBS UP?

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RACE Race of Respondent Value = 3 Other

REGION Page 1 of 1

Nor for others... There's a pattern, but...

HAPPY	Count / Col Pct	North East	South East	West	Row Total
1 Very Happy	Count	5	3	4	12
	Col Pct	35.7	21.4	21.1	25.5
2 Pretty Happy	Count	7	9	10	26
	Col Pct	50.0	64.3	52.6	55.3
3 Not Too Happy	Count	2	2	5	9
	Col Pct	14.3	14.3	26.3	19.1
Column Total		14 29.8	14 29.8	19 40.4	47 100.0

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Reminder: Crosstabs & x^2

If they cross the line, can you still remain friends? * What is your gender? Crosstabulation

			What is your gender? Male	Female	Total
If they cross the line, can you still remain friends?	Yes	Count	71	167	238
		% within What is your gender?	91.0%	78.0%	81.5%
	No	Count	7	47	54
		% within What is your gender?	9.0%	22.0%	18.5%
Total		Count	78	214	292
		% within What is your gender?	100.0%	100.0%	100.0%

Here, **females are more than twice as likely to say they can't still remain friends (22% vs. 9%);**

males are more likely to say they can, and modal percentages fall along the "main diagonal";

& the difference is statistically significant ($p<.05$).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.398[b]	1	.011		
Continuity Correction[a]	5.565	1	.018		
Likelihood Ratio	7.196	1	.007		
Fisher's Exact Test				.011	.007
Linear-by-Linear Association	6.376	1	.012		
N of Valid Cases	292				

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& No Association for "Other" Races

Chi-Square	Value	DF	Significance
Pearson	1.96551	4	.74210
Likelihood Ratio	1.88961	4	.75605
Mantel-Haenszel linear association	1.27015	1	.25974

It's not significant!

Minimum Expected Frequency - 2.681

Cells with Expected Frequency < 5 - 6 OF 9 (66.7%)

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Now, I understand crosstabs.

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree

THUMBS UP?

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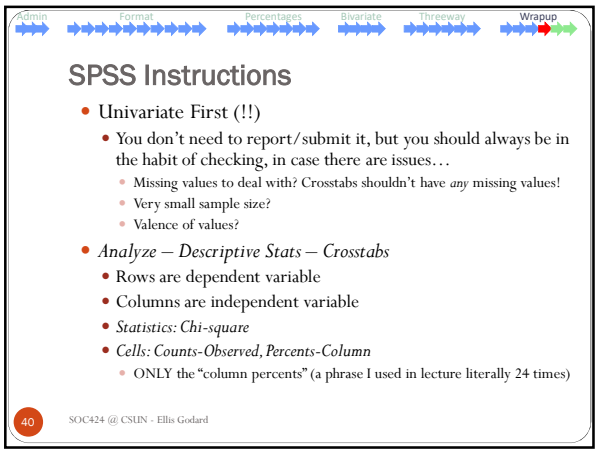
Admin
Format
Percentages
Bivariate
Threeway
Wrapup
SPSS Instructions
Univariate First (!!)
You don't need to report/submit it, but you should always be in the habit of checking, in case there are issues…
Missing values to deal with? Crosstabs shouldn't have any missing values!
Very small sample size?
Valence of values?
Analyze – Descriptive Stats – Crosstabs
Rows are dependent variable
Columns are independent variable
Statistics: Chi-square
Cells: Counts-Observed, Percents-Column
ONLY the "column percents" (a phrase I used in lecture literally 24 times)
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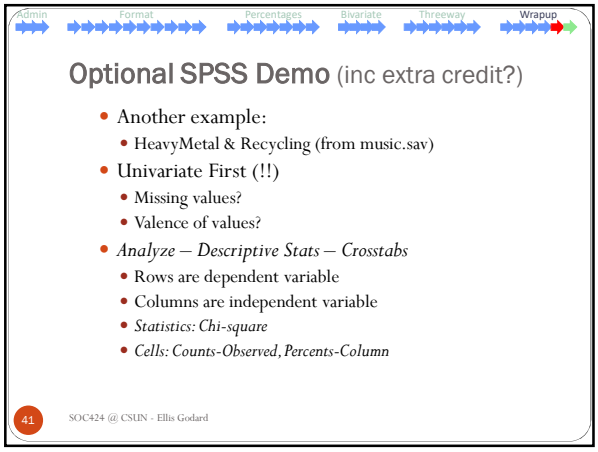
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Wrapup
Optional SPSS Demo (inc extra credit?)
Another example:
HeavyMetal & Recycling (from music.sav)
Univariate First (!!)
Missing values?
Valence of values?
Analyze – Descriptive Stats – Crosstabs
Rows are dependent variable
Columns are independent variable
Statistics: Chi-square
Cells: Counts-Observed, Percents-Column
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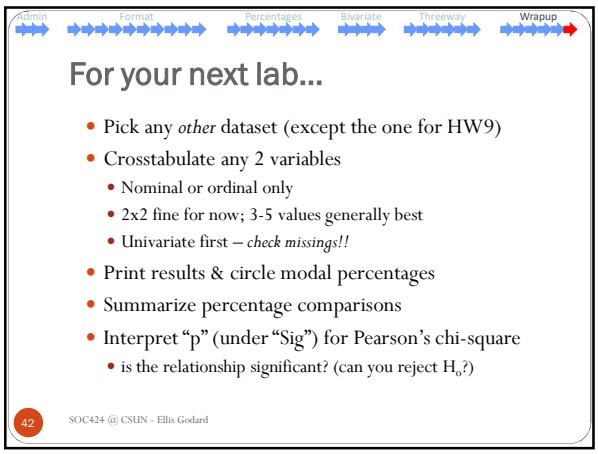
Admin
Format
Percentages
Bivariate
Threeway
Wrapup
For your next lab…
Pick any other dataset (except the one for HW9)
Crosstabulate any 2 variables
Nominal or ordinal only
2x2 fine for now; 3-5 values generally best
Univariate first – check missings!!
Print results & circle modal percentages
Summarize percentage comparisons
Interpret "p" (under "Sig") for Pearson's chi-square
is the relationship significant? (can you reject H_o?)
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