Chapter 2:

Organizing Information

Frequency Distributions

A table reporting the number of observations falling into each category of the variable.

The purpose is typically to present a large amount of data in an easily readable format

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Example
Frequency Distribution

Identity	Frequency (f)
Native American of multiple ancestry	269,700
Native American of Indian descent	5,537,600
Native American of other descent	947,500
Total (N)	6,754,800

Example of a <u>Percentage Distribution</u>

Table 10.1 Final Grades in Social Statistics of 1,200 Students (1983-1993)

Midpoint Score	Frequency Bar Chart	Freq.	Cum. Freq. (below)	%	Cum % (below)
40	*	4	4	0.33	0.33
50	*******	78	82	6.5	6.83
60	***************	275	357	22.92	29.75
70	***********************	483	840	40.25	70
80	***************	274	1114	22.83	92.83
90	*******	81	1195	6.75	99.58
100	*	5	1200	0.42	100

Reading a Table:
1. What is the title of the table?
2. What is the purpose of the table?
3. What is the primary variable(s) in the table?
4. How many cases are reported in the table?
5. What is the source of the data in the table?

Death Penalty Statutes 1993
(data from which to create a cumulative frequency distribution)

State	Minimum Age	State	Minimum Age
Arkansas	14	Texas	17
Virginia	15	California	18
Alabama	16	Colorado	18
Delaware	16	Connecticut	18
Indiana	16	Illinois	18
Kentucky	16	Louisiana	18
Mississippi	16	Maryland	18
Missouri	16	Nebraska	18
Nevada	16	New Jersey	18
Oklahoma	16	New Mexico	18
Wyoming	16	Ohio	18
Georgia	17	Oregon	18
New Hampshire	17	Tennessee	18
North Carolina	17		

Source: Kathleen Maguire and Ann L. Pastore, eds., *Sourcebook of Criminal Justice Statistics. 1994.* U.S. Department of Justice, Bureau of Justice Statistics. Washington, D.C.: U.S. Government Printing Office, 1995, pp. 115-116.

<u>In-class assignment</u>:
Create a table and present these numbers in a frequency distribution

State	Minimum Age	State	Minimum Age
Arkansas	14	Texas	17
Virginia	15	California	18
Alabama	16	Colorado	18
Delaware	16	Connecticut	18
Indiana	16	Illinois	18
Kentucky	16	Louisiana	18
Mississippi	16	Maryland	18
Missouri	16	Nebraska	18
Nevada	16	New Jersey	18
Oklahoma	16	New Mexico	18
Wyoming	16	Ohio	18
Georgia	17	Oregon	18
New Hampshire	17	Tennessee	18
North Carolina	17		

Creating a Frequency Distribution

Minimum Age	Tally (of states)	Frequency
14	|	1
15	|	1
16	|||||||||	9
17	||||	4
18	||||||||||||	12
Total N		27

Table 1: Age Limits for U.S. State Death Penalty Statutes

Minimum Age	State Frequencies
14	1
15	1
16	9
17	4
18	12
Total N	27

Proportions and Percentages

- **Proportion (P):** a relative frequency obtained by dividing the frequency in each category by the total number of cases.

$$P = \frac{f}{N}$$

- **Percentage (%):** a relative frequency obtained by dividing the frequency in each category by the total number of cases <u>and</u> multiplying by 100.

- **N:** total number of cases

$$(\%) = P(100)$$

- Proportions and percentages are *relative frequencies*

Proportions and Percentages

Minimum Age	Frequency	Proportion	Percentage
14	1	**1/27=.037**	3.7
15	1	.037	3.7
16	9	.333	33.3
17	4	.148	14.8
18	12	.444	44.4
Total N	**27**	**1.0**	**100.0**

Frequency tables vary somewhat by the level of measurement of the variable of interest.

What are the levels of measurement?

Frequency Distributions for <u>Nominal</u> Variables

Gender	Tallies	Freq. (f)	Percentage
Male	||||||||||||||	15	37.5
Female	|||||||||||||||||||||||||	25	62.5
Total (N)		40	100.0

<u>Note</u>: The categories for nominal variables (male, female) do not have to be listed in any particular order.

Frequency Distributions for <u>Ordinal</u> Variables

Happiness	Tallies	Freq. (f)	Percentage
Very Happy	|||||||||	9	22.5
Pretty Happy	|||||||||||||||||||||||||	25	62.5
Not too happy	||||||	6	15.0
Total (N)		**40**	**100.0**

<u>Note</u>: Because the categories or values of ordinal variables are <u>rank-ordered</u>, they must be listed in a way that reflects their rank – from the lowest to the highest or from the highest to the lowest.

Frequency Distributions for Interval-Ratio Variables

Number of Children	Freq. (f)	Percentage
0	5	12.5
1	10	25.0
2	10	25.0
3	5	12.5
4	5	12.5
5	1	___
6	2	___
7 or more	2	___
Total (N)	**40**	**100.0**

Frequency Distributions for Interval-Ratio Variables

Number of Children	Freq. (f)	Percentage
0	5	12.5
1	10	25.0
2	10	25.0
3	5	12.5
4	5	12.5
5	1	2.5
6	2	5.0
7 or more	2	5.0
Total (N)	**40**	**100.0**

Cumulative Distributions

- **Cumulative _frequency_ distribution:** a distribution showing the frequency at or below each category (class interval or score) of the variable.

- **Cumulative _percentage_ distribution:** a distribution showing the percentage at or below each category (class interval or score) of the variable.

Cumulative Frequency Distribution

Minimum Age	Freq. (f)	Percentage	Cumulative Frequency
14	1	3.7	01
15	1	3.7	02
16	9	33.3	11
17	4	14.8	___
18	12	44.4	___
Total	27	99.9*	

* Doesn't total to 100% due to rounding

Cumulative Frequency Distribution

Minimum Age	Freq. (f)	Percentage	Cumulative Frequency
14	1	3.7	01
15	1	3.7	02
16	9	33.3	11
17	4	14.8	15
18	12	44.4	27
Total (N)	27	99.9*	

* Doesn't total to 100% due to rounding

Cumulative Percentage Distribution

Minimum Age	Frequency	Percentage	Cumulative Percentage
14	1	3.7	3.7
15	1	3.7	7.4
16	9	33.3	40.7
17	4	14.8	___
18	12	44.4	99.9*
Total N	27	99.9*	

* Doesn't total to 100% due to rounding

Cumulative Percentage Distribution

Minimum Age	Frequency	Percentage	Cumulative Percentage
14	1	3.7	3.7
15	1	3.7	7.4
16	9	33.3	40.7
17	4	14.8	55.5
18	12	44.4	99.9*
Total N	27	99.9*	

* Doesn't total to 100% due to rounding

Rates

A number obtained by dividing the number of *actual* occurrences in a given time period by the number of *possible* occurrences.

$$\text{Marriage rate, 1990} = \frac{\text{Number of marriages in 1990}}{\text{Total population in 1990}}$$

$$\text{Marriage rate, 1990} = \frac{2,448,000 \text{ marriages}}{250,000,000 \text{ Americans}}$$

Marriage rate, 1990 = .0098
(9.8 marriages for every 1000 people)

Reading Statistical Tables

Basic principles for understanding what the researcher is trying to tell you (that is, questions you should ask yourself when reading a table):

- What is the source of this table?
- How many variables are presented? What are their names?
- What is represented by the numbers presented in the first column? In the second column?

Example of Table Format for Research Paper

Table 1: The Effect of Sex on Attitudes Toward the Death Penalty

In Favor of the Death Penalty
(actual number of respondents reported)

		Yes	No	Total
	Male	36	19	55
Gender	Female	33	18	51
	Total	69	37	106

(Source: non-random sample obtained by students in a college statistics class)

Table 1. Prevalence of Each Category of Adverse Childhood Experiences and ACE Score by Sex*

	No. (%)		
	Women (n = 9367)	Men (n = 7970)	Total (N = 17 337)
Adverse childhood experiences			
Emotional abuse	1227 (13.1)	602 (7.6)	1829 (10.5)
Physical abuse	2530 (27.0)	2382 (29.9)	4912 (28.3)
Sexual abuse	2310 (24.7)	1276 (16.0)	3586 (20.7)
Battered mother	1281 (13.7)	920 (11.5)	2201 (12.7)
Household alcohol/drug abuse	2759 (29.5)	1896 (23.8)	4655 (26.9)
Mental illness in household	1937 (20.7)	1058 (13.3)	2995 (17.3)
Parental separation or divorce	2293 (24.5)	1738 (21.8)	4031 (23.3)
Incarcerated household member	485 (5.2)	324 (4.1)	809 (4.7)
ACE score			
0	3271 (34.9)	3044 (38.2)	6315 (36.4)
1	2299 (24.5)	2237 (28.1)	4536 (26.2)
2	1443 (15.4)	1297 (16.3)	2740 (15.8)
3	969 (10.3)	685 (8.6)	1654 (9.5)
4	665 (7.1)	382 (4.8)	1047 (6.0)
5	390 (4.2)	212 (2.7)	602 (3.5)
6	210 (2.2)	74 (0.9)	284 (1.6)
≥7	120 (1.3)	39 (0.5)	159 (0.9)

*For ACE Study waves 1 and 2 combined. ACE indicates adverse childhood experiences. See "Methods" for definitions of each type of adverse event.

Source: Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). **Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: findings from the Adverse Childhood Experiences Study**. *Jama, 286*(24), 3089-3096.

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Slide 1

Table 1. Demographic data for girls and women aged 13–24 years

	Participants (n=1244)*
Age-group	
13–17 years	575 (46·4%)
18–24 years	669 (53·6%)
Community setting	
Urban	201 (14·9%)
Rural	1043 (85·1%)
Orphan status†	
Biological mother died	125 (9·6%)
Biological father died	241 (18·4%)
Death of both biological parents	83 (7·6%)
Death of at least one biological parent‡	449 (36·0%)
Marital status	
Married	127 (9·7%)
Not married	1112 (90·3%)

Source : Reza, A., Breiding, M. J., Gulaid, J., Mercy, J. A., Blanton, C., Mthethwa, Z., ... & Anderson, M. (2009). **Sexual violence and its health consequences for female children in Swaziland: a cluster survey study**. *The Lancet, 373*(9679), 1966-1972.

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Slide 2

Table. 1 Unregistered births (1000s) in 2003 by region and level of development

	Births	Unregistered children
World	133 028	48 276 (36%)
Sub-Saharan Africa	26 879	14 751 (55%)
Middle East and north Africa	9790	1543 (16%)
South Asia	37 099	23 395 (63%)
East Asia and Pacific	31 616	5901 (19%)
Latin America and Caribbean	11 567	1787 (15%)
CEE<comma> CIS<comma> and Baltic states	5250	1218 (23%)
Industrialised countries	10 827	218 (2%)
Developing countries	119 973	48 147 (40%)
Least developed countries	27 819	16 682 (71%)

Source : Marmot, M., Friel, S., Bell, R., Houweling, T. A., & Taylor, S. (2008). **Closing the gap in a generation: health equity through action on the social determinants of health**. *The Lancet, 372*(9650), 1661-1669.

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Thank You.

Slide 4

In-class assignment:

Add a column of proportions and a column of percentages to your table of state age limits

Slide 5

SPSS Output Looks Something Like This:

V13 * V6 Crosstabulation

			V6 Yes	V6 No	Total
V13	Male	Count	36	19	55
		% within V6	52.2%	51.4%	51.9%
		% within V13	65.5%	34.5%	100.0%
	Female	Count	33	18	51
		% within V6	47.8%	48.6%	48.1%
		% within V13	64.7%	35.3%	100.0%
Total		Count	69	37	106
		% within V6	100.0%	100.0%	100.0%
		% within V13	65.1%	34.9%	100.0%

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Example of Table Format for Research Paper

Table 1: The Effect of Sex on Attitudes Toward the Death Penalty

Column % Row%		Percent In Favor of the Death Penalty* Yes	No	Total
Gender	Male	52 / 65 / (36)	51 / 35 / (19)	100 / (55)
	Female	48 / 65 / (33)	49 / 35 / (18)	100 / (51)
Total		100 / (69)	100 / (37)	100 / (106)

*Numbers in parentheses are actual numbers of respondents