


Frequency Distributions



An organized tabulation of the number of individuals located in each category on the scale of measurement

Start with a bunch of numbers in a data set
10 5 6 7 8 4 6 7 8 4 6 5 3 8 9 10
What's a better way to organize this?
MAKE A TABLE!

<u>X (possible score)</u>	<u>f (frequency)</u>
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Types of Frequency

- **Simple**
 - number of people with each score
- **Grouped**
 - number of people in a particular subset
 - Ex. A's, B's, C's, D's, F's on exam

Getting _____

Start with a frequency distribution table
Obtain $f \cdot X$ (see below)
Add up $f \cdot X$

X (possible score)	f (frequency)	$f \cdot X$	$\Sigma f \cdot X$
1	0		
2	0		
3	1		
4	2		
5	2		
6	3		
7	2		
8	3		
9	1		
10	2		

_____ and _____

Why Use Them?

- Standardizes frequency distributions so you can make comparisons among them
- Example:
 - Seven students received an A (over 90%) on a Chemistry exam
 - Seven students received an A (over 90%) on a Psychology exam
 - Are the exams equally difficult?
 - Need to know number of students in each class, right?
 - If 100 students are in the Chemistry class and 30 are in the Psychology class, the exams are not equal (comparing 7% vs. 23% of students receiving A's)

Getting Proportions and Percentages

Start with a frequency distribution table
Determine N
Divide f by N to get proportion (p)
Multiply p by 100 to get the percentage (%)

X (possible score)	f (frequency)	p (f / N)	%
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Percentages & Percentile

Some Definitions

- **Cumulative** _____ (*cf*)
 - Number of people in the distribution with a given score OR LESS
- **Cumulative** _____ (*c%*)
 - Percent of people in the distribution with a given score OR LESS
 - Also called **rank** or **percentile rank**


Why Use Them?

- Allows researcher to make comparisons among scores within the distribution
- Example:
 - Seven students received an A (over 90%) on a Psychology exam
 - Does this mean they performed significantly better than their classmates?
 - Need to know how the other students performed
 - It would make a difference if everybody else received B's, or if everybody else received a C or less, right?

Getting Cumulative Frequencies and Percentile Rank


Start with a frequency distribution table
Determine the cumulative frequency (*cf*)
Determine *N*
Divide *cf* by *N* to get percentile rank (*c%*)

<i>X</i> (possible score)	<i>f</i> (frequency)	<i>cf</i>	<i>c%</i>
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			




_____ for
Percentiles

- Sometimes researchers want to know what particular percentile ranks are, although that information is not directly available in the table
 - GRE will do this for your scores
 - Ex. 90th, 75th, 50th percentile
 - How is this done?



_____ for
Percentiles

1. Find the two %'s between which the given percentile rank would be found
2. Calculate the difference between the two %'s (**D%**)
3. Calculate the difference between the corresponding scores (**Dsco**)
4. Calculate the difference between the lower percentage and the desired percentile rank (**Dper**)
5. Use these numbers in the following formula:
 $Int = (Dsco * Dper) \div D\%$



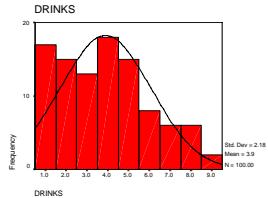
Formula for

$$Int = (Dsco * Dper) \div D\%$$

Int. will give you the amount to ADD to the lower score

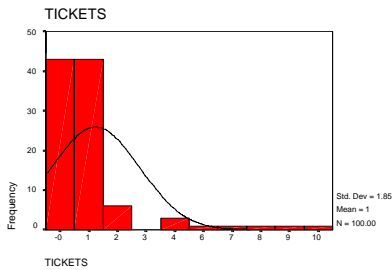
This will be the score that reflects the percentile you are looking for

- Possible values on x-axis
- Number of times value appears on y-axis
- Below: Number of drinks in a week among college students



Skewed

- Most scores grouped at bottom, but some scores are extremely high



Skewed

- Most scores grouped at top, but some scores are extremely low

