Human-Computer Interaction
IS4300

1

T5b – Paper Prototyping
due next class

- Recruit 3-5 users who are as close as possible to your target demographic.
- Be sure to record demographic information (age, gender, education, occupation, etc.) for your report.
- **Testing Users** When you run your prototype on a user, you should do the following things:
    - Obtain verbal consent for participation.
    - Brief the user.
    - Present one task.
    - Watch the user do the task. Take notes of your observations.
    - Repeat with the other tasks.
    - Interview users, take any measures you think are important.

2

Problem

Example: Paper Prototyping usability test.

3

Usability.gov
Your guide for developing usable and useful Web sites

Short Usability Test Report for [Site]

Date of Report: [Month Day, Year]
Date of Test: [Month Day, Year]
Location of Test: [City, State]

Prepared for: [Name]
Phone Number: [XXX-XXX-XXXX]
Email: [name@address.gov]

Prepared by: [Name]
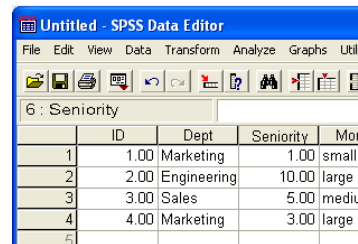Phone Number: [XXX-XXX-XXXX]
Email: [name@address.gov]

Executive summary

NOTE: This section describes the main goal and rationale of the study. Briefly describe the scenarios that participants completed, how the sessions were conducted, and how many participants took part in the study. This section should also discuss overall trends, such as whether or not participants were able to complete all the tasks. Data should be reported as both a number of completed scenarios as well as a percentage. Is there is a reason why tasks were completed or not? Be sure to give an overall impression (theme) about what the reader will encounter in the report.

4

Coding data

- Transcribe all interviews
- Code (data entry) all measures
  - Questionnaires
  - Metrics (times, errors)
  - Check for errors, missing data
  - Unstacked format typical
  - Excel ok for very simple analyses, recommend SPSS or R for more complex
- Do asap, by people in the room

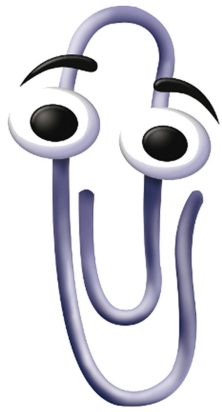|	ID	Dept	Seniority	Mon
1	1.00	Marketing	1.00	small
2	2.00	Engineering	10.00	large
3	3.00	Sales	5.00	mediu
4	4.00	Marketing	3.00	large
5				

Summarizing Data

- Qualitative
  - Problem analysis
  - Text analysis
- Quantitative
  - Descriptive statistics
  - Inferential statistics

6

Summarizing Qualitative Data
Use with Interview & Think Aloud data

7

Analytic Induction & Saturation
## Example: Opinions of Clippy

9

Problem ("usability defect") analysis
Example: Optometrist website

- U1: Could not find SEARCH function. Failed to complete.
- U2: Spent long time finding contents of cart. Completed.
- U3: Spent long time finding SEARCH function. Completed.
- U4: No problems.
- U5: Could not find SEARCH function. Failed to complete.
- U6: Did not like colors on checkout page.

10
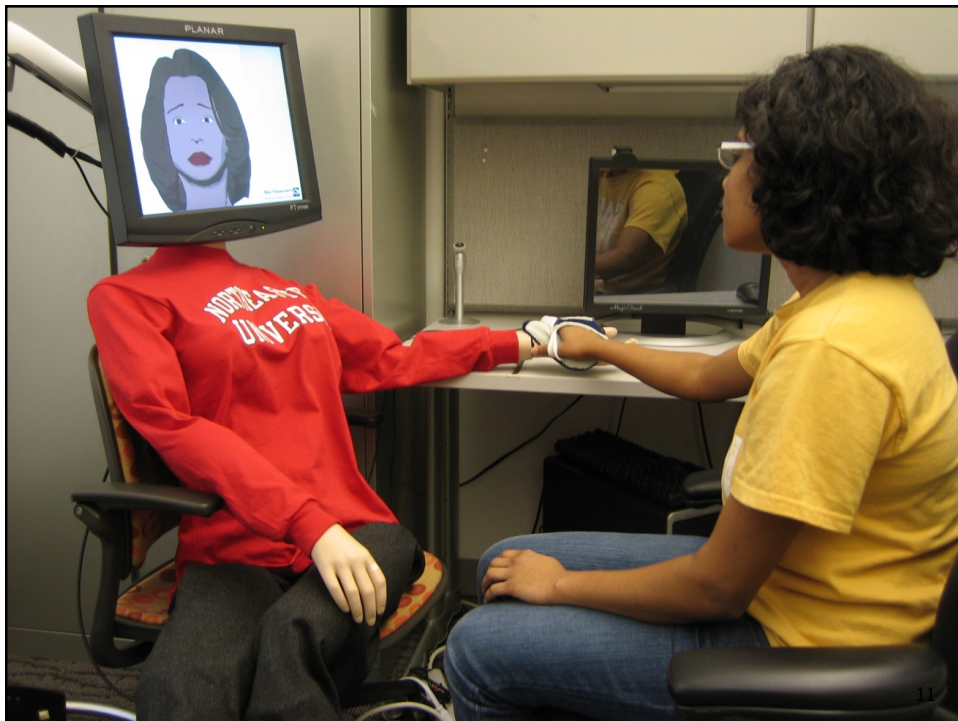
Acceptance Study

- *"Wizard of Oz"*
- *Conversations*
  - *Education about skin cancer risks*
  - *Explore feelings about cancer*
- Semi-structured interview
  - What were your overall impressions?
  - How did you feel about the expansion of the glove?
  - What do you think Tanya was trying to communicate with the glove?
  - Did the message from the glove match what Tanya was saying?
  - Did it feel natural?

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Exercise

- Get into groups
- Do a qualitative analysis of interview transcripts from the study

- Identify "Themes"
  - Support
  - Best examples
- Recommendations

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Summarizing Quantitative Data

Kinds of Measures

Primary source:

Bordens & Abbott, *Research Design and Methods*

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Scales of Measurement

- *Nominal Scale*
  - Lowest scale of measurement involving variables whose values differ by category (e.g., male/female)
  - Values of variables have different names, but no ordering of values is implied
- *Ordinal Scale*
  - Higher scale of measurement than nominal scale
  - Different values of a variable can be ranked according to quantity (e.g., high, moderate, or low self-esteem)

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Scales of Measurement

- *Interval Scale*
  - Scale of measurement on which the spacing between values is known
  - No true zero point
  - E.g. Fahrenheit
- *Ratio Scale*
  - Similar to interval scale, but with a true zero point (e.g., number of lever presses, height)

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What kind is it?

- Age
- Gender
- Job Category (Engineer, Manager…)
- Efficiency (time to complete)
- School Year (Freshman…)
- Temperature (Celsius)
- Think aloud quotes / themes
- Monitor Size
- Competition medal (Gold, Silver, Bronze)
- Weather (Rain, Snow, …)
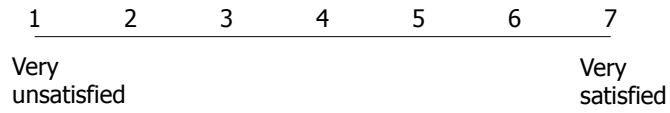- Debrief quotes / themes
- Productivity (wpd)
- Owns Pet (or not)

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What kind is it?

- How satisfied are you?

1   2   3   4   5   6   7

Very
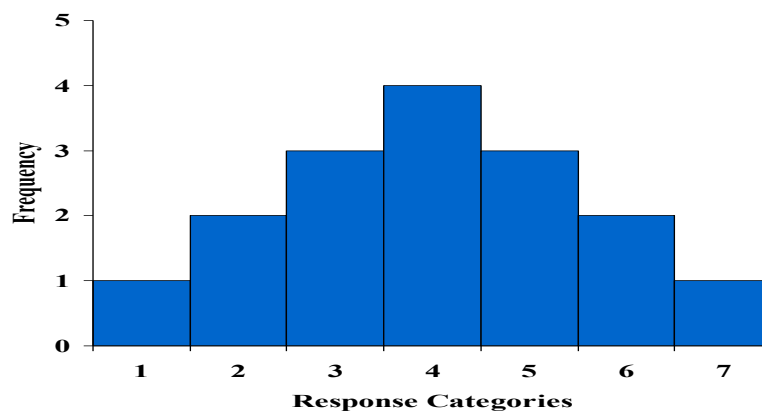unsatisfied

Very
satisfied

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Descriptive Analyses
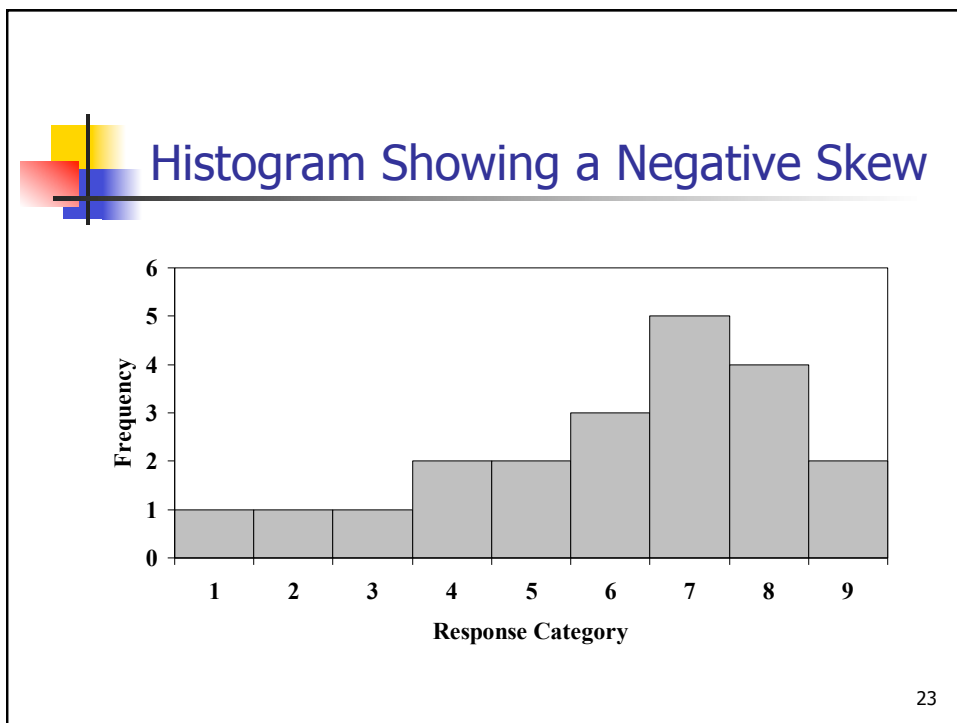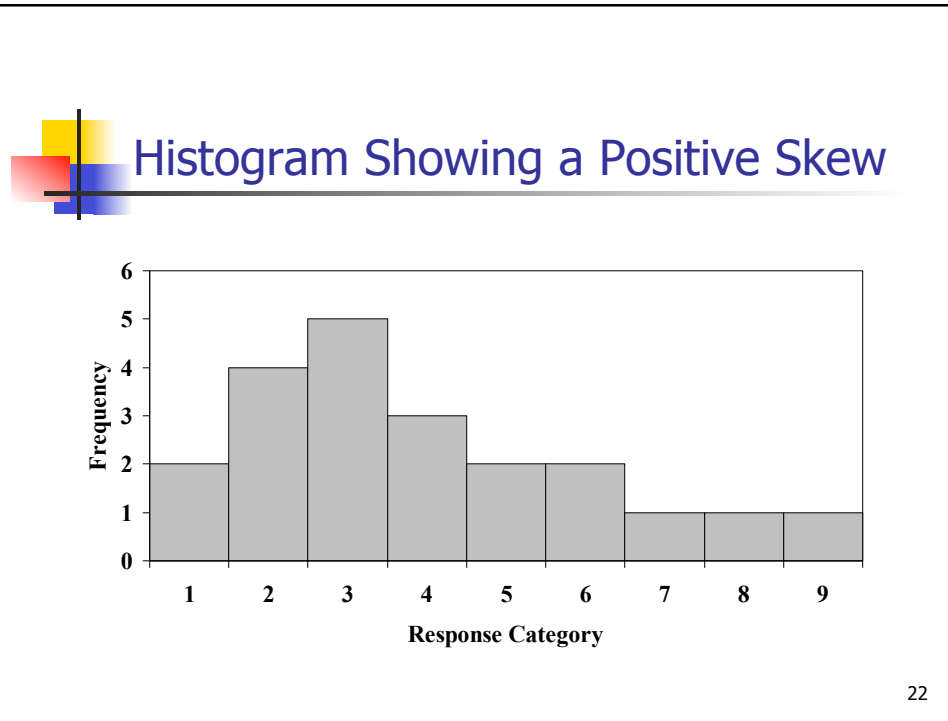
19

Descriptive Statistics

- A collection of values can be described with two parameters:
  - Measure of center
  - Measure of spread
- You will decide on statistical methods depending on the type of your measure and its distribution (histogram)
- IMPORTANT: For a given measure
  - Report only ONE measure of center
  - Report ZERO or ONE measure of spread
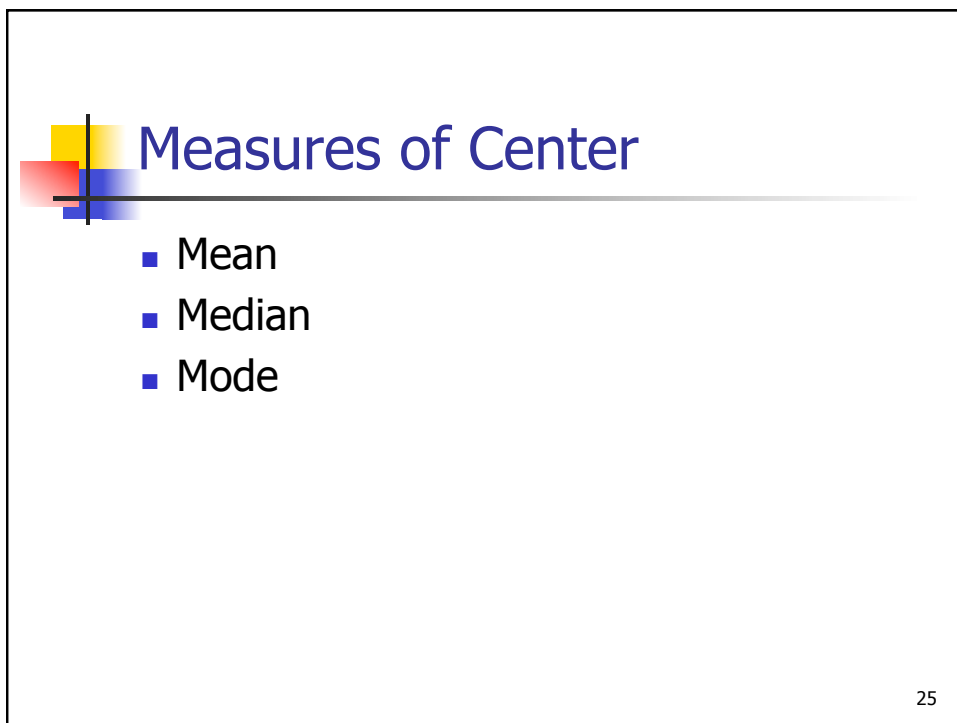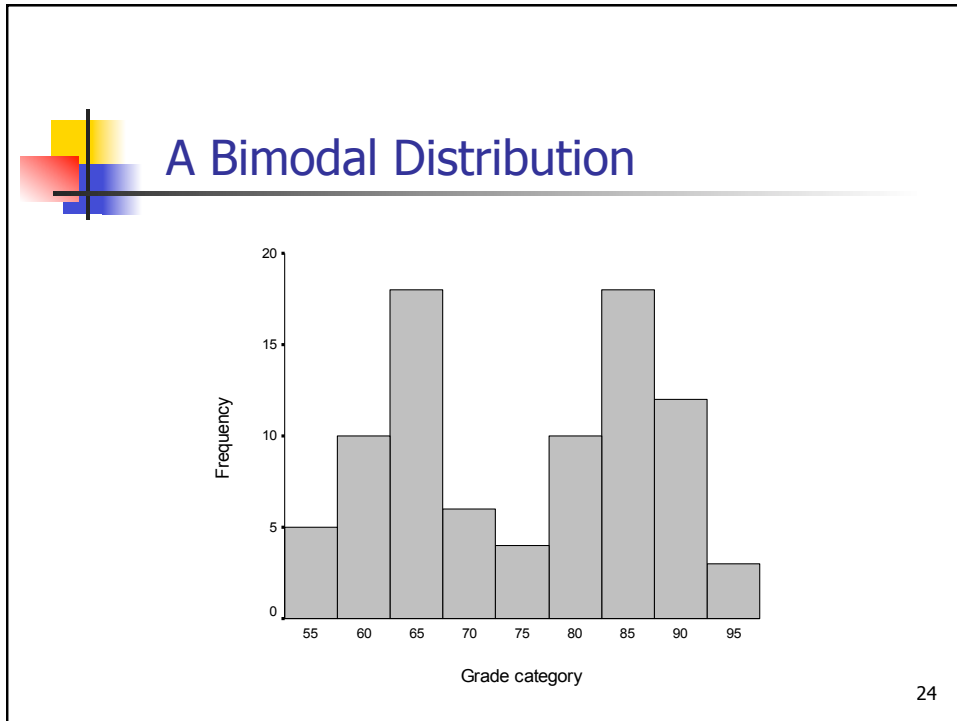
20

Histogram Showing a "Normal" Distribution

21

Histogram Showing a Positive Skew

22

Histogram Showing a Negative Skew

23

A Bimodal Distribution

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Measures of Center

- Mean
- Median
- Mode

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Measures of Center: Characteristics and Applications

- *Mode*
  - Most frequent score in a distribution
  - Simplest measure of center
  - Scores other than the most frequent not considered
  - Limited application and value
- *Median*
  - Central score in an ordered distribution
  - More information taken into account than with the mode
  - Relatively insensitive to outliers
  - Prefer when data is skewed
  - Used primarily when the mean cannot be used

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Decision rule

- If nominal, use mode
- Else if interval or ratio and approximately normal and no outliers, use mean
- Else, use median

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Measures of Spread

- Std Deviation
- Inter-quartile range
- Range

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Measures of Spread: Characteristics

- *Range*
  - Subtract the lowest from the highest score in a distribution of scores
  - Simplest and least informative measure of spread
  - Scores between extremes are not taken into account
  - Very sensitive to extreme scores
- *Interquartile Range*
  - Less sensitive than the range to extreme scores
  - Used when you want a simple, rough estimate of spread

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Measures of Spread: Characteristics

- *Variance*
  - Average squared deviation of scores from the mean
- *Standard Deviation*
  - Square root of the variance
  - Most widely used measure of spread
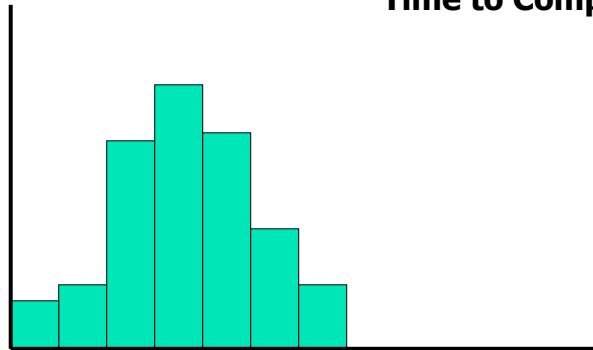
30

Decision rule

- If nominal or ordinal, stop (no statistic)
- If interval or ratio and approximately normal and no outliers, use stddev
- Else use inter-quartile range

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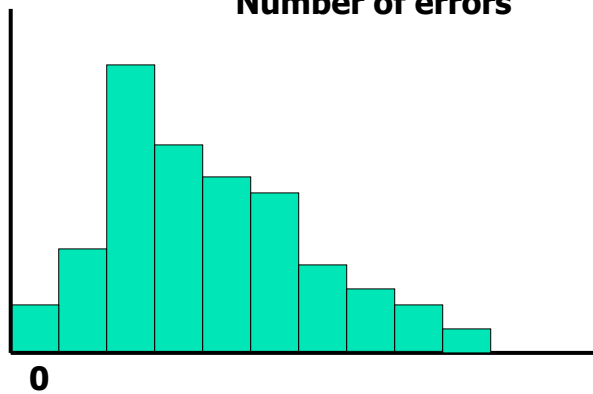# Which measures of center and spread?

Time to Complete

32

Which measures of center and spread?

Number of errors

0

33

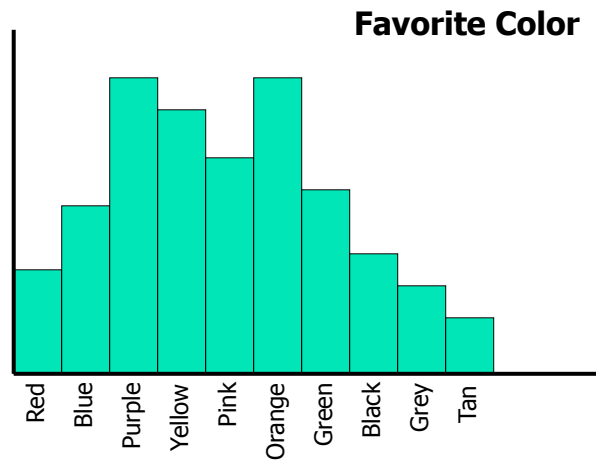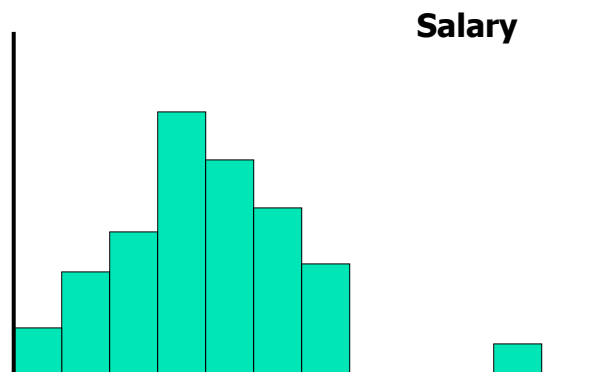# Which measures of center and spread?

Favorite Color

34

Which measures of center and spread?

Salary

35

Which measures of center and spread?

Student Year

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Which measures of center and spread?

Satisfaction
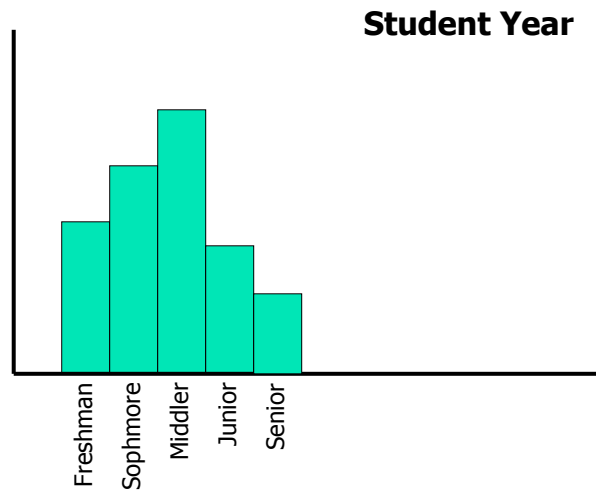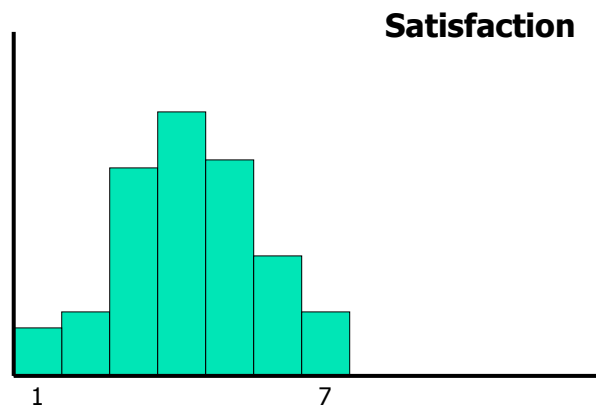
37

Which measures of center and spread?

Performance wpd
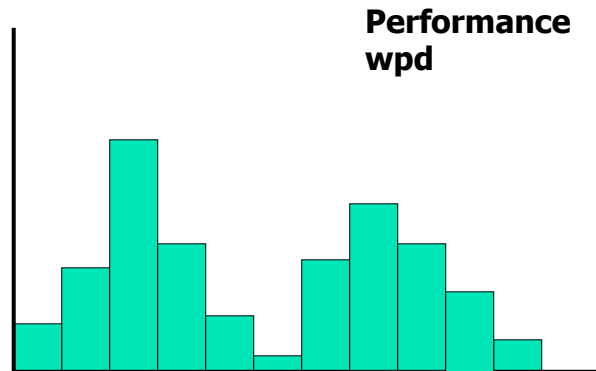
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Recent controversy over analysis of scale measures

- Historically, have been treated as interval if they appear normal (i.e., with mean, stdev, and t-test)
- Some statisticians say NEVER. They are ordinal measures – must use median, no meaningful range measures, and non-parametric inferential statistics (e.g., Mann-Whitney)
- See
  - "Stats: We're Doing It Wrong" on ACM.ORG

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Which measures of center and spread?

Satisfaction

1
Very unsatisfied

10
Very satisfied

40

Exercise

- Which descriptive stats to use on an example questionnaire

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Please take a moment and answer a few questions about yourself:

Q1. Age:_____   **Q2. Sex:** ☐ **Male** ☐ **Female**

Q3. Years employed at BigBucks software:_____

Q4. Ethnic Background (check one):

Pop	____
Classic rock	____
Country	____
Hip-Hop/Rap	____
Classical	____
Other	____

NOTE: Q3 has outliers that can't be dropped

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Q5. *Overall satisfaction with application.*

How **satisfied** are you with the application you just tried?

not at all   •   •   •   •   •   •   •   very satisfied

Q6. What is your opinion of the application (check one):

It should get an award.	____
It's ok.	____
I would use it if I had to.	____
I would never use it.	____

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Writing up your usability test results... use the template!

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Usability.gov
Your guide for developing usable and useful Web sites

Short Usability Test Report for [Site]

Date of Report:	[Month Day, Year]
Date of Test:	[Month Day, Year]
Location of Test:	[City, State]
Prepared for:	[Name]
Phone Number:	[XXX-XXX-XXXX]
Email:	[name@address.gov]
Prepared by:	[Name]
Phone Number:	[XXX-XXX-XXXX]
Email:	[name@address.gov]

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Call for Expert Web Designers

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To Do

- Read
  - Designing for Web (Benyon Ch 16).
- Finish P5
  - paper prototyping

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