



# Human-Computer Interaction IS4300

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## Homework I6 *due today*

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- Your objective in this assignment is to get some experience with Frames, Dialogs and layout managers in Swing. Your mission is to create your own (ideally project-related) application with the following minimum requirements:
  - A JFrame and a (non-modal) JDialog.
  - A JTabbedPane and JScrollPane.
  - Nested JPanels including the following layout managers: GridLayout, FlowLayout, BorderLayout
  - Some interaction widgets (JButton, etc.) on every JPanel and tab.
  - Reasonable behavior when the JFrame is resized.
- **NOTE:** You may not use GridBagLayout, Free Design, Box, Overlay, Null or Absolute Layout anywhere in the project.

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## 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.

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## Problem



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 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.

Example: Paper Prototyping usability test.

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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]  
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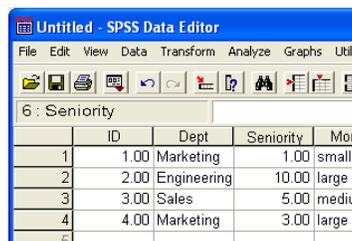
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## Coding data

- 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



6 : Seniority				
	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

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

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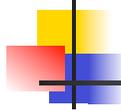


## Summarizing Qualitative Data

Use with Interview & Think Aloud data

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## Qualitative Analysis

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- Goals
  - Search for commonalities, which lead to categories
    - known as codes or themes
  - Search for contrasts/comparisons
- Themes/Codes can have hierarchical structure
  - Like Product
    - Like functionality
    - Like report generation capability

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## Inductive Coding

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- No preconceived themes
- Your analysis and codes/themes come directly from reading/thinking about data
- Iterative analysis
  - Often referred to as a Grounded Analysis.
  - Establish tentative codes, look for more support, refine the codes as needed

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# Qualitative Analysis Software e.g. NVivo

The screenshot displays the NVivo software interface. On the left, a 'Sources' pane shows a tree view of data sources. The main window is divided into several panes:

- Interviews Table:** A table listing interview sources with columns for Name, Notes, References, and other metadata.
- Text Excerpt:** A window showing a text snippet with two questions:
  - Q.1 Current use of time:** "In an 'ordinary' week, how do you currently spend your time? (What takes most time, how much time spent on work, family, leisure etc...?) I am still studying so an ordinary week for me is mainly spent studying and working part time. I spend about 32 hours a week at work, 6 contact hours at university, and I spend my weekends and evenings studying. I also play Netball and attend a Yoga class on an evening once a week."
  - Q.2a Feelings about current time use?:** "How do you feel about your time use now? Does it fit with your goals? Are there other things you'd like to fit in? Look, it's as effective as it can possibly be given my current commitments. I do wish I had more leisure time to spend with my friends and family and my partner. I also wish I had time to take dancing classes and learn a second language, but these things will need to wait until I have completed my course."
- Code Tree:** A diagram on the right showing a central node 'Interviews' with arrows pointing to several code folders: 'R14-F-NL', 'R5-F-NL', 'R5-M-NL', 'R2-M-EW', and 'J-M-EW'. Each folder is labeled 'Codes'.

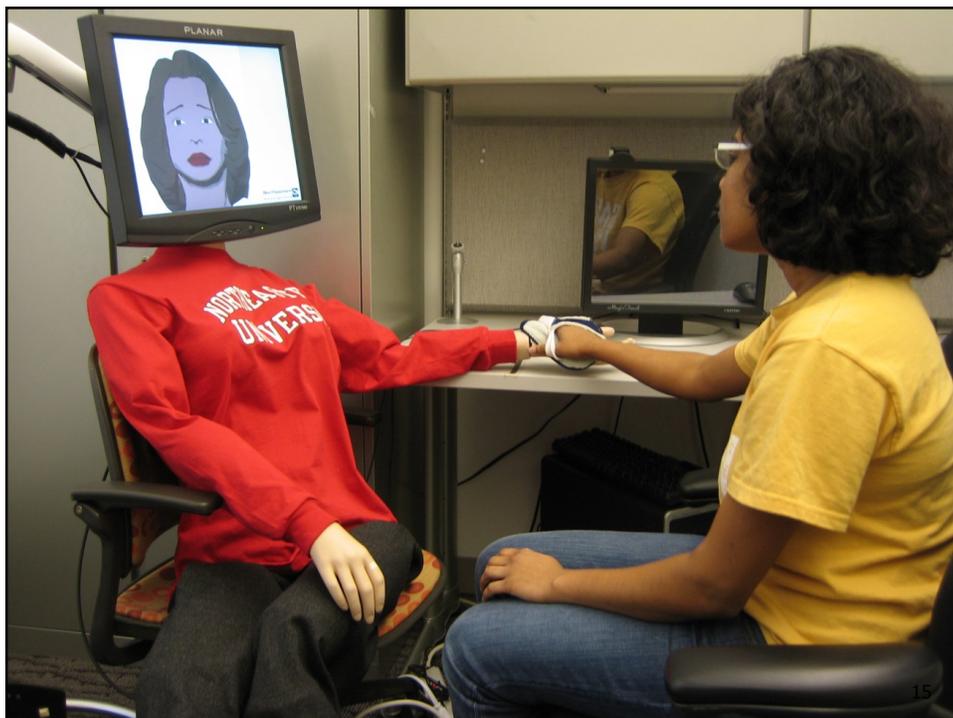
# Analytic Induction & Saturation Example: Opinions of Clippy

The slide features a large, stylized cartoon drawing of a paperclip character. The character is blue and purple, with large, expressive eyes and a simple mouth, giving it a friendly, anthropomorphic appearance. It is positioned centrally on the slide.

## 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.

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## Acceptance Study

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- *“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

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- 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

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Primary source:  
Bordens & Abbott, *Research  
Design and Methods*

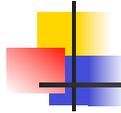
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### Scales of Measurement

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- *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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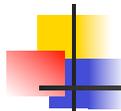


## Scales of Measurement

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- *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?

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- 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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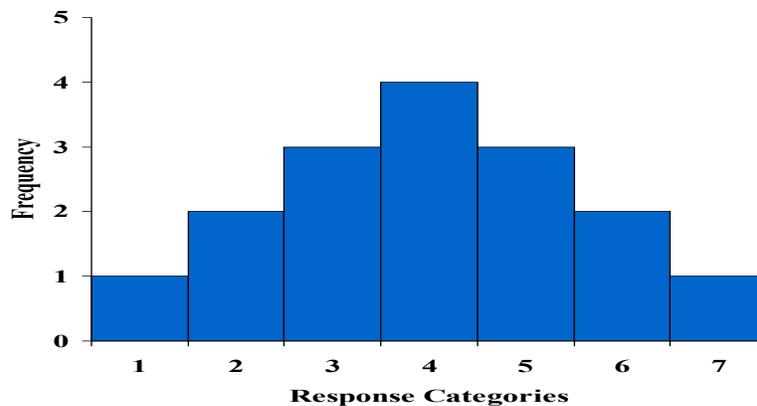


## Descriptive Statistics

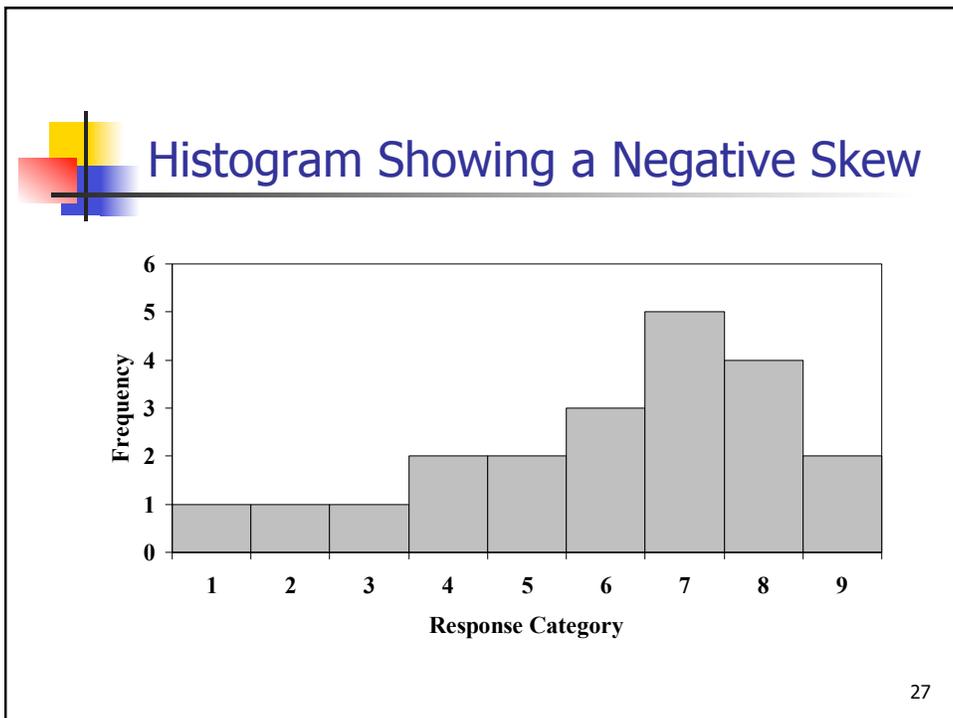
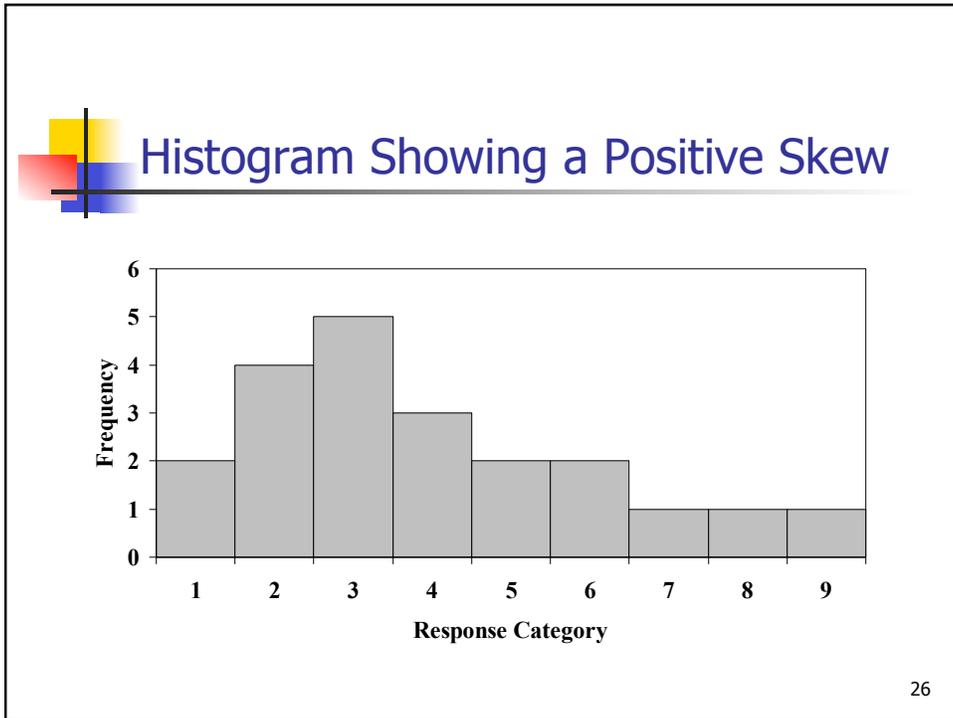
- A collection of values can be described with two parameters:
  - Measure of center
  - Measure of spread
- You will decide on statistical methods depending on the type of your measure and its distribution (histogram)
- **IMPORTANT:** For a given measure
  - Report only ONE measure of center
  - Report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

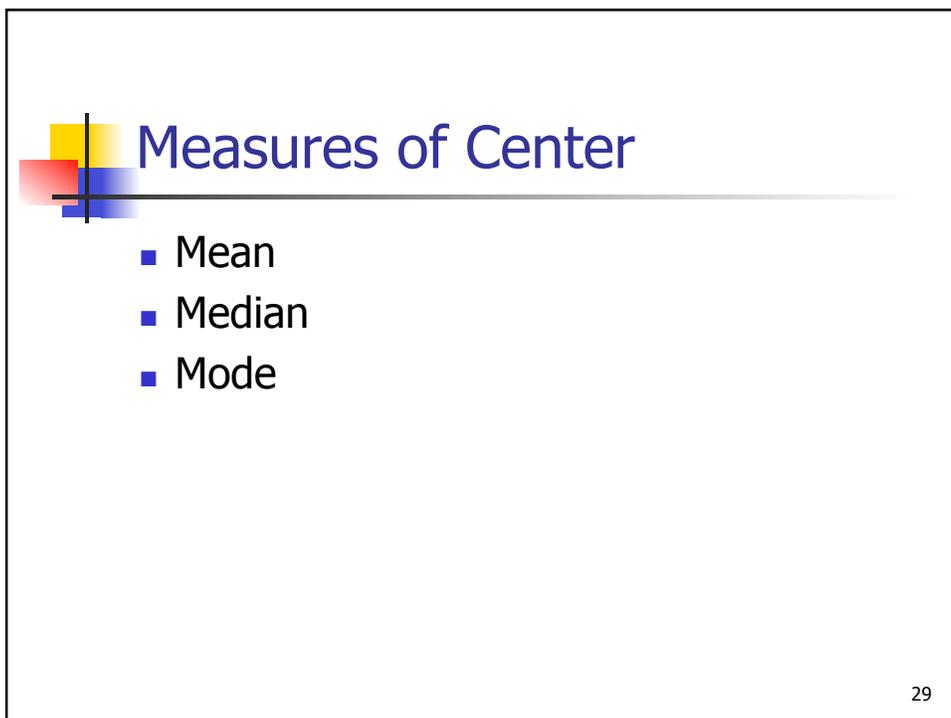
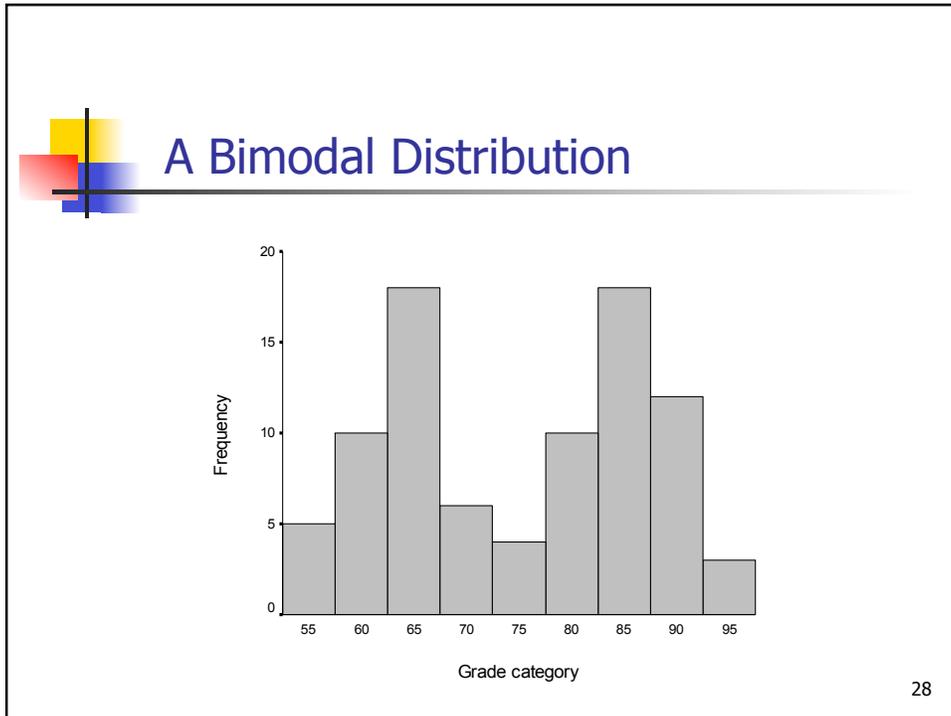
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## Histogram Showing a "Normal" Distribution



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## Measures of Center: Characteristics and Applications

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- *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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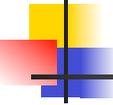


## Decision rule

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- 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

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- Std Deviation
- Inter-quartile range
- Range

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## Measures of Spread: Characteristics

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- *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

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

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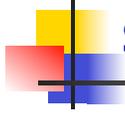
## Decision rule

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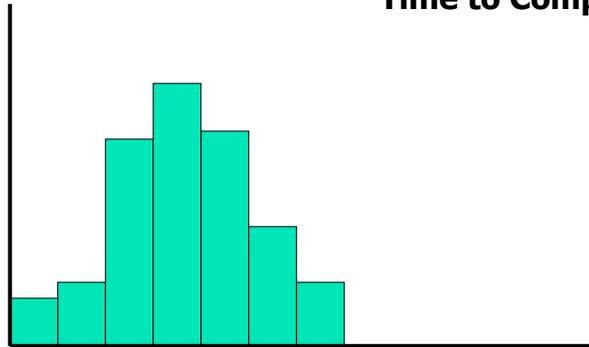
- If nominal or ordinal, stop (no statistic)
- If interval or ratio and approximately normal and no outliers, use stddev
- Else use inter-quartile range

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## Which measures of center and spread?

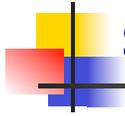


**Time to Complete**

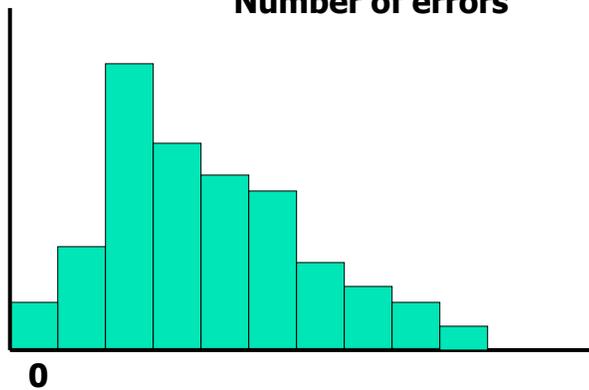


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## Which measures of center and spread?

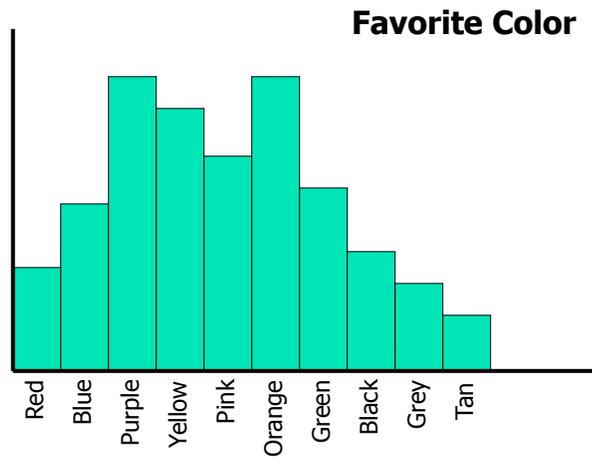
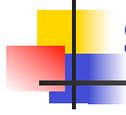


**Number of errors**



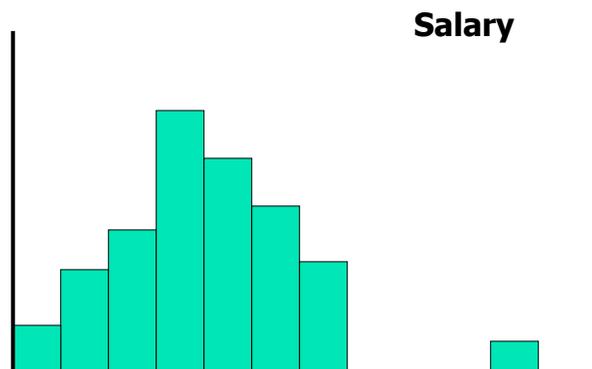
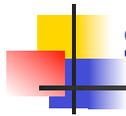
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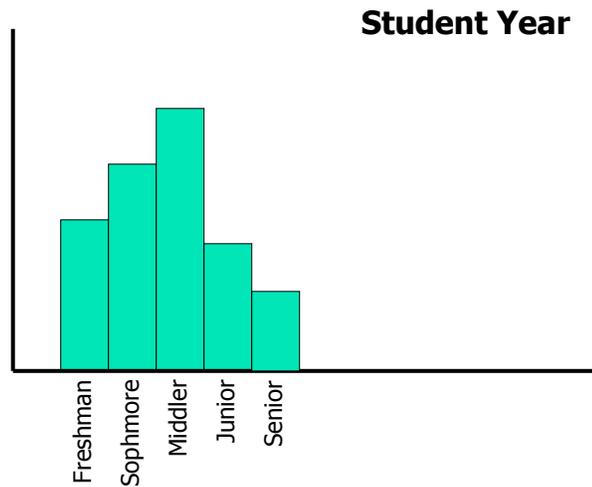
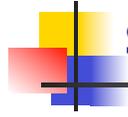
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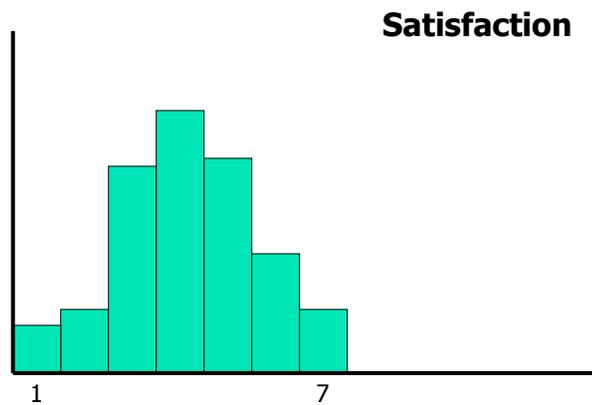
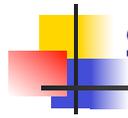
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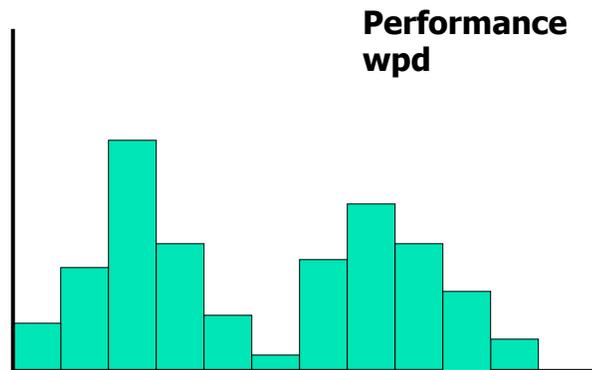
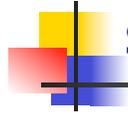
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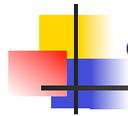
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## Which measures of center and spread?



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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?



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## 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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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]  
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## To Do

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- Read
  - Designing for Mobile (Benyon Ch 19).
- Finish P5
  - paper prototyping