An Introduction to Usability Testing

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Background

Origin of the Species

- "Usability testing" is the common name for multiple forms both user and non-user based system evaluation focused on a specific aspect of the design
- Done for many, many years prior, but popularized in the media by Jakob Neilson in the 1990's

What does "usability" mean?

- ISO 9126
  - "A set of attributes that bear on the effort needed for use, and on the individual assessment of such use, by a stated or implied set of users"
- ISO 9241
  - "Extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use."

Simplified: Usability is the ability of a specific group of people to perform specific tasks in a specific environment.

Usability testing is *assessing* the ability of a specific group of people to perform specific tasks in a specific environment.

The Ontology of "Usability"

- Accessibility
  - A precursor to usability: if users cannot gain access to the product, its usability is a moot point
- Functional Suitability
  - Does the product contain the functionality required by the user? This is the products utility, but related to usability in terms of desirability.
- Functional Discoverability
  - Can the user "discover" the functions of a product?
- Ease-of-learning
  - Can the user figure out how to exercise the functionality provided?
- Ease-of-use
  - Can the user exercise the functionality accurately and efficiently once its learned (includes accessibility issues)?
  - Can users use it safely?
- Ease-of-recall
  - Can the knowledge of operation be easily maintained over time?
- Safety
  - Can the user operate the system in relative safety, and recover from errors?
- Subjective Preference
  - Do user's like using it?

Psychology Primer

What are we really testing?

The camera that is your eye (and other myths)

“Your consciousness is like a tiny stowaway on a transatlantic steamship taking credit for the journey without taking into account the massive engineering underfoot.” - David Eagelman, *Incognito: The Secret Lives of the Brain*

2 System Theory

- The car versus elephant analogy. - Daniel Gilbert, *Stumbling on Happiness*
- System 1: Automated and Unconscious Processes
- System 2: Conscious Processes

System 1: Unconscious/Automated Processes

- Fast processing of information
- Multi threaded processing
- Used to construct our understanding (perception) of the world
- >90% (perhaps >99%) of our daily functioning is precessed at the system 1 level

System 2: Conscious Awareness (Attention)

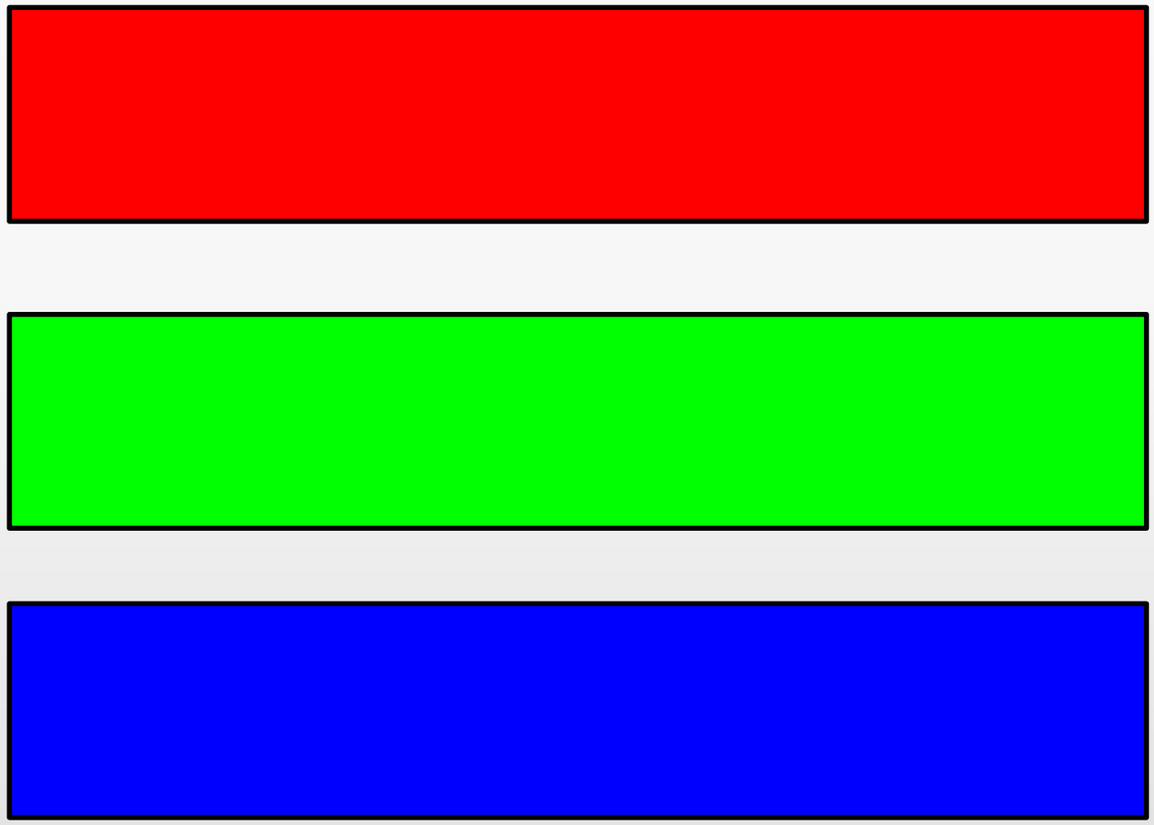
- Slow processing of information
- Highly limited in processing capacity and focus
- Generally just monitors system 1 (though we assume its doing more).
- Able to influence system 1 processing, but not “in control”
- Nearly always unaware of the effects of system 1 processing on decision making.

How fast is fast?

Nolan Ryan's fast ball was clocked at 101 mph. At that speed, the ball will cross the 60' 6" distance to home plate in 0.04 seconds. That means, in order to hit a fast ball, the signal must reach the eye, be sensed by the occipital node of the brain, be processed, a signal sent to the motor cortex, signals sent to the arms and legs, and the body move in that much time.

But conscious processing of input data does not even begin for .05 seconds after input is received.

Stroop Test



Orange

Yellow

Green

Black

Blue

Red

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Attention

Awareness is not needed to function...

- ...and its a good thing, based on the limits of our awareness
- How many times have you found yourself thinking about something in the morning while taking your shower and wonder if you actually washed your hair?
- If you are in a car singing along with the radio and you get distracted thinking about some topic, you may not recall that your continued to sing, but others around you can attest to the fact that you did, indeed sing and didn't go blank or babble.
- Similarly, the reserve is true, you can read a passage, get distracted, and feel you need to reread the passage to learn it. But research has shown that facts get through even though you're not conscious of it.

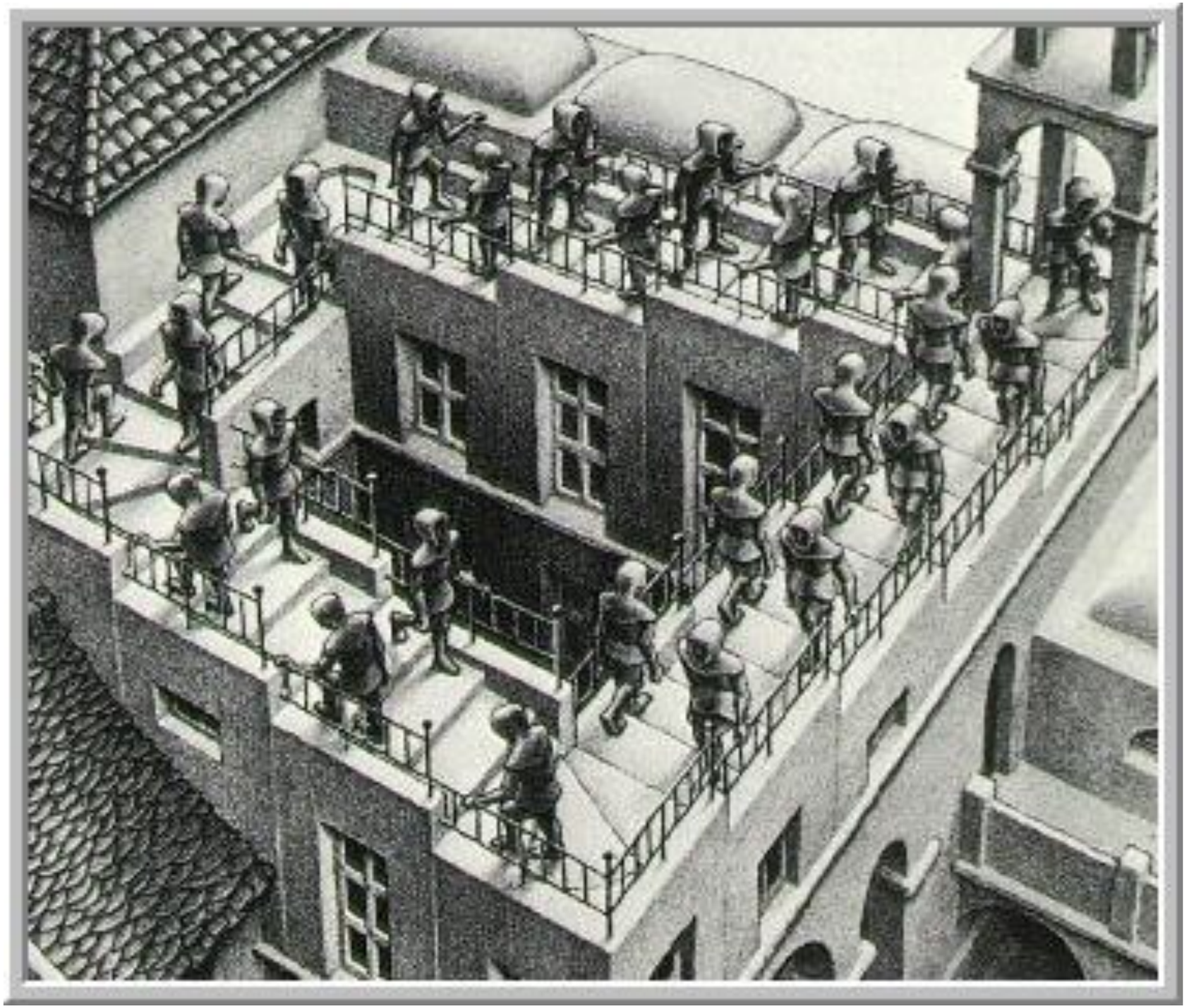
Humans attempt to avoid mental effort, often resulting in errors of judgment and calculation. However, the level 2 processing can be activated. Example: In an experiment a set of puzzles (the Cognitive Reflection Test) were presented to students at Princeton. When the fonts and representation were simple, 90% of the participants made an error on at least one of the three problems. When the font was muddled and it was hard to read, error rates dropped to 35%

Test Your Attention

Change Blindness

Example 1

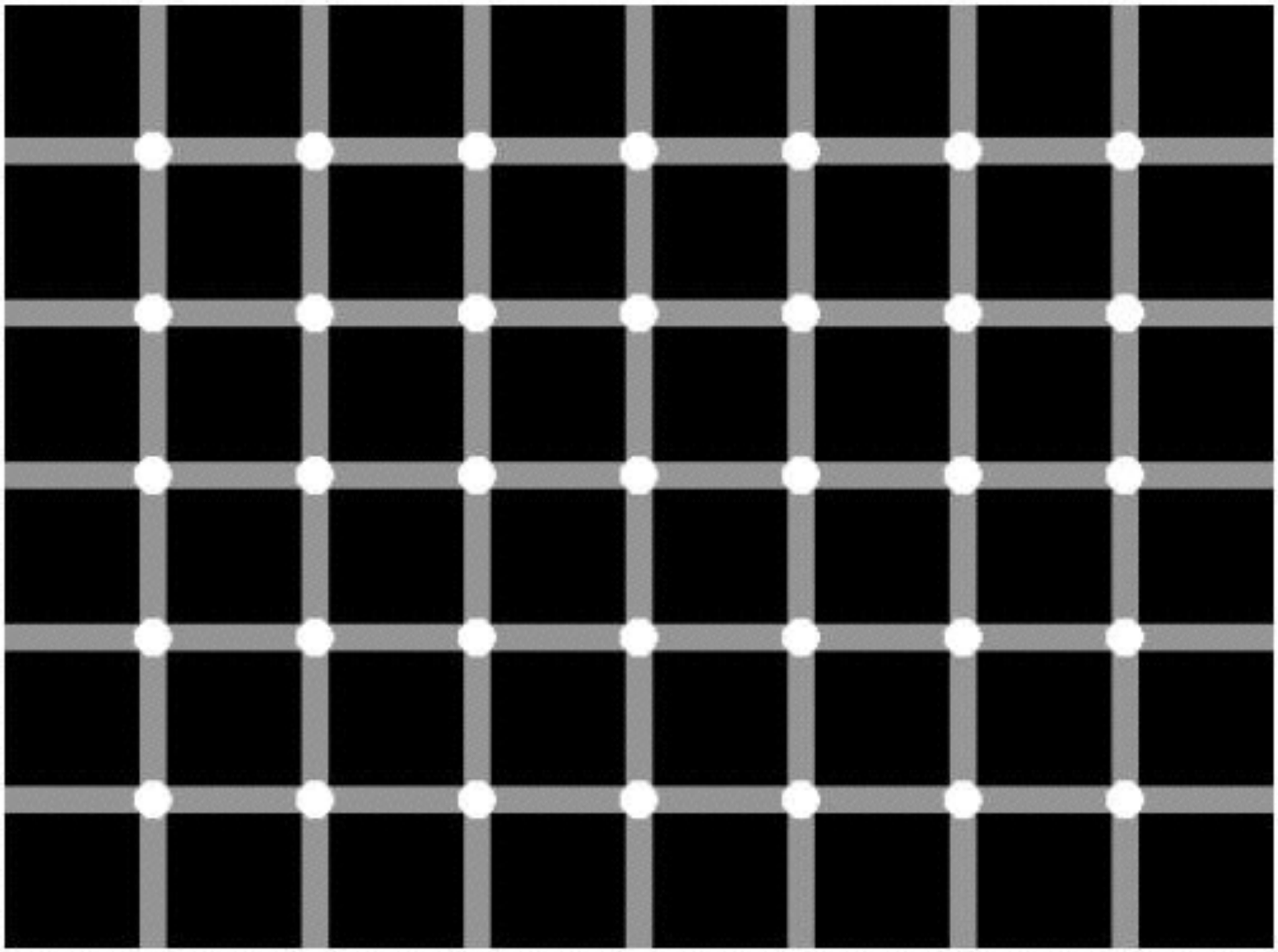
Example 2



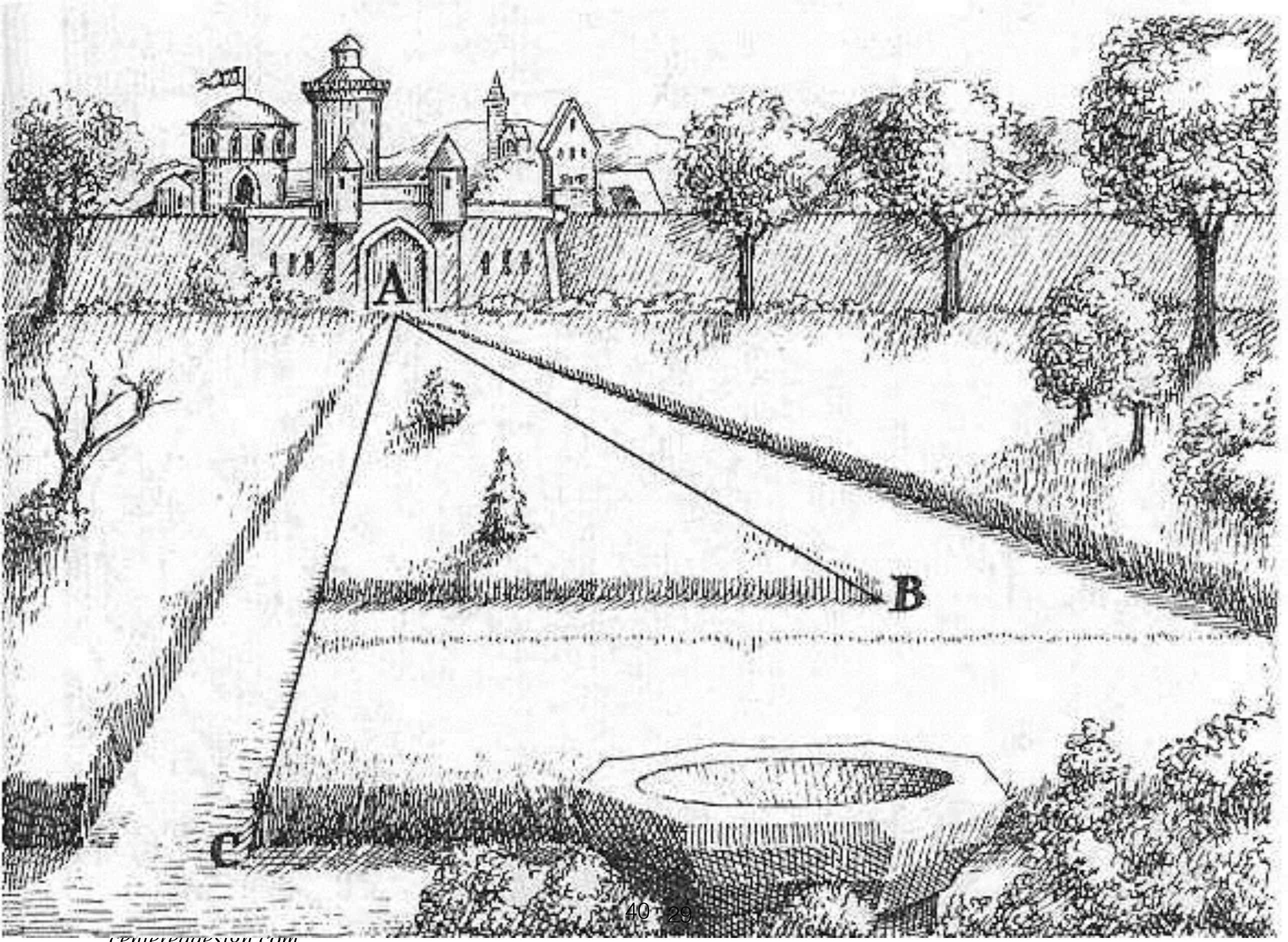
Developing Expertise

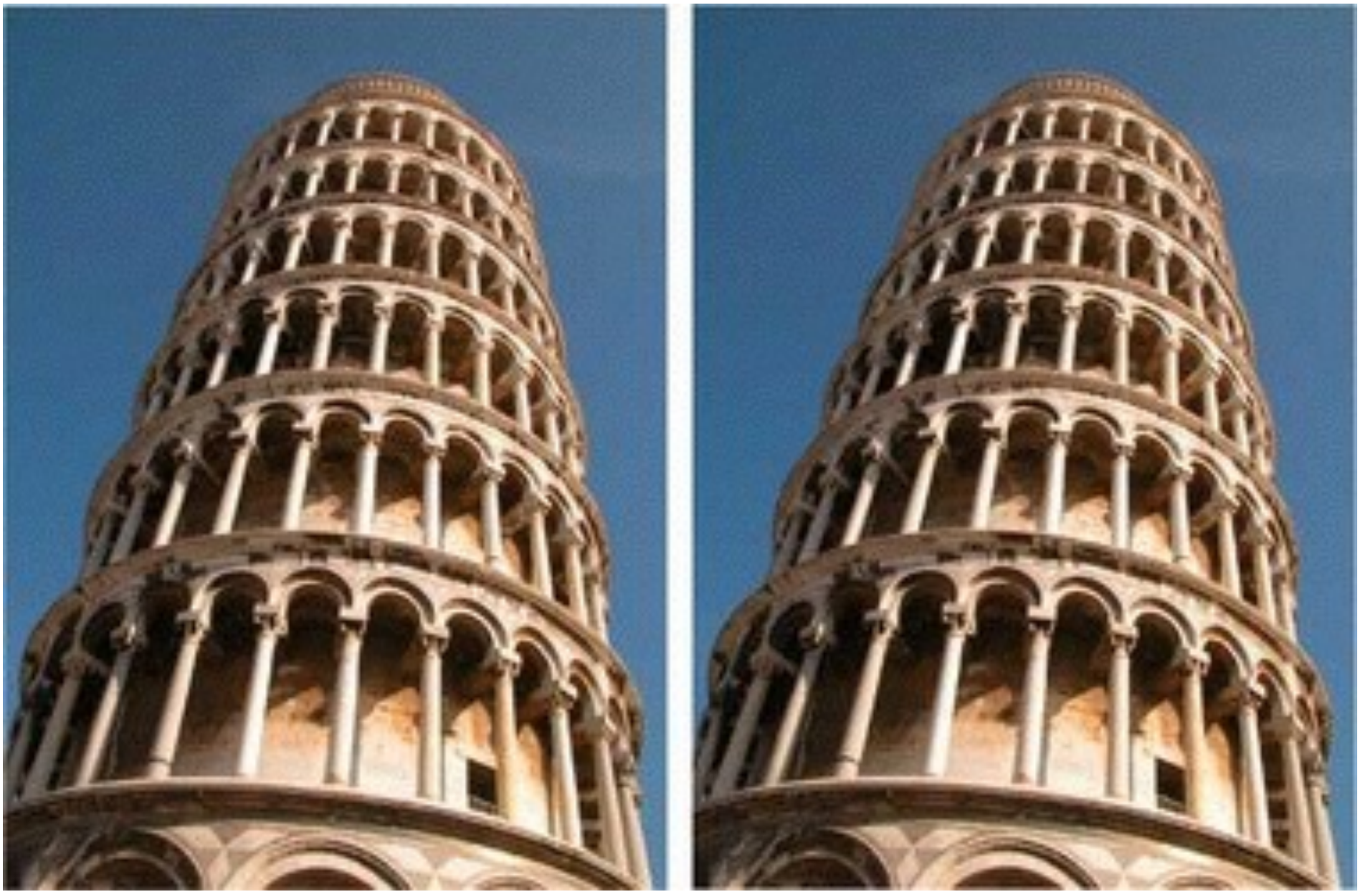
- We (usually) need conscious awareness to learn an activity, but as we become proficient, even expert, the thinking and decision making moves from level 2 (conscious) to level 1 (unconscious)
- Consider driving a car. When you first leaned to drive a car, it required all of your attention. You could not (should not) listen to the radio, engage in a conversation, etc. But as you became more skilled, you moved the activity from conscious (level 2) thinking and decision making to non conscious (level 1) thinking and decision making
- However, as a result, you are also no longer conscious of what you're doing while driving

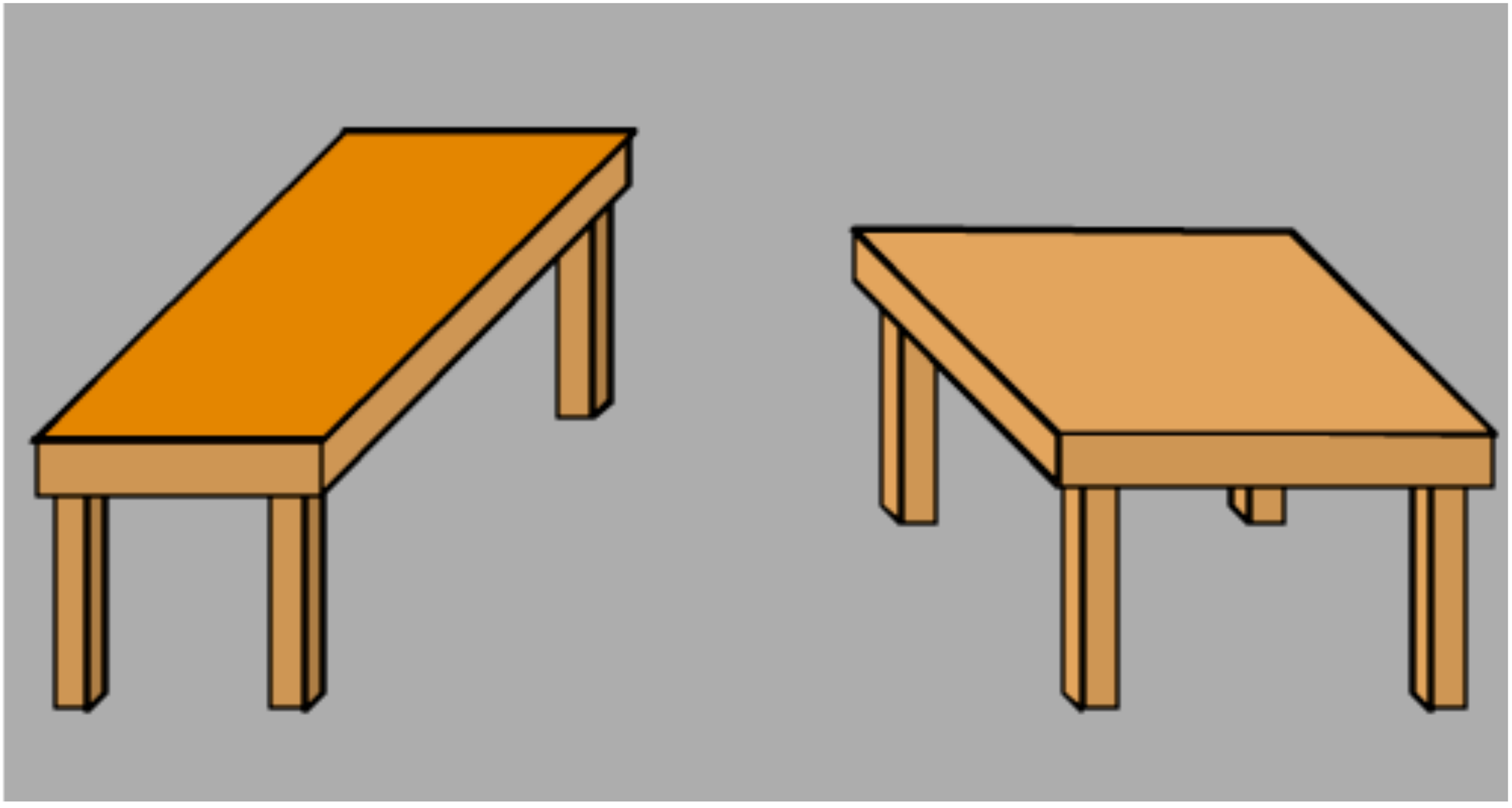
Perception

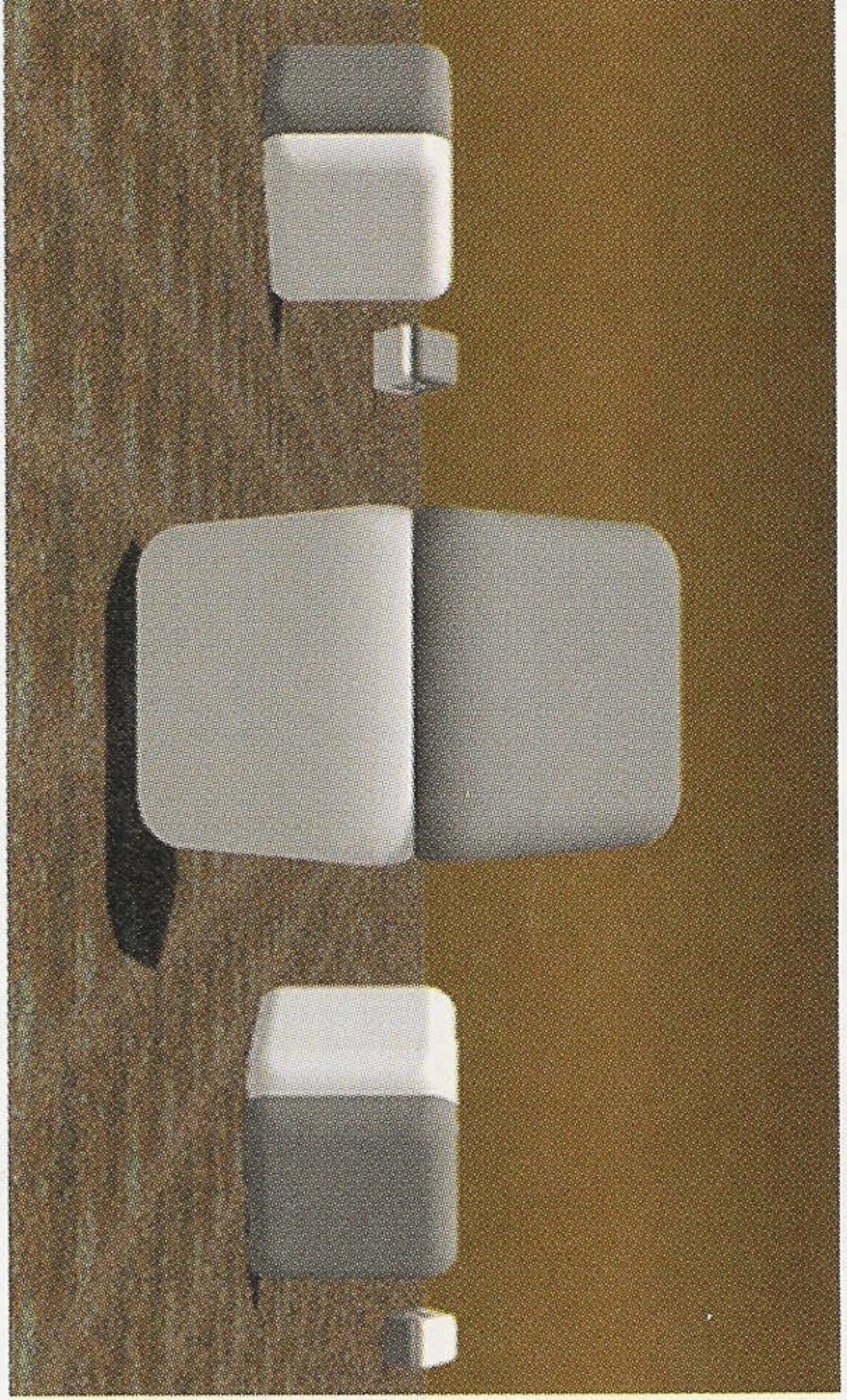


Count the black dots! :o)









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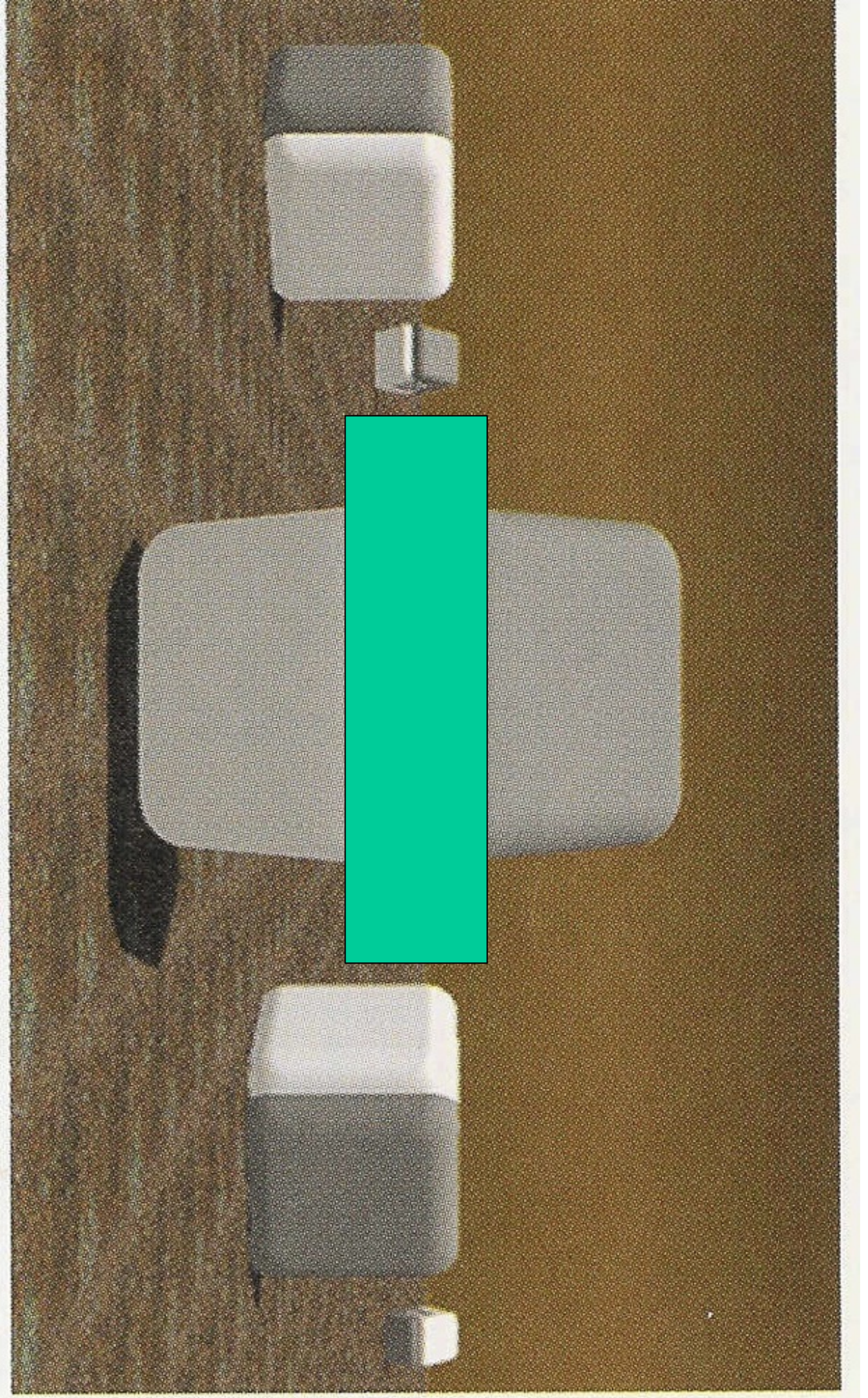

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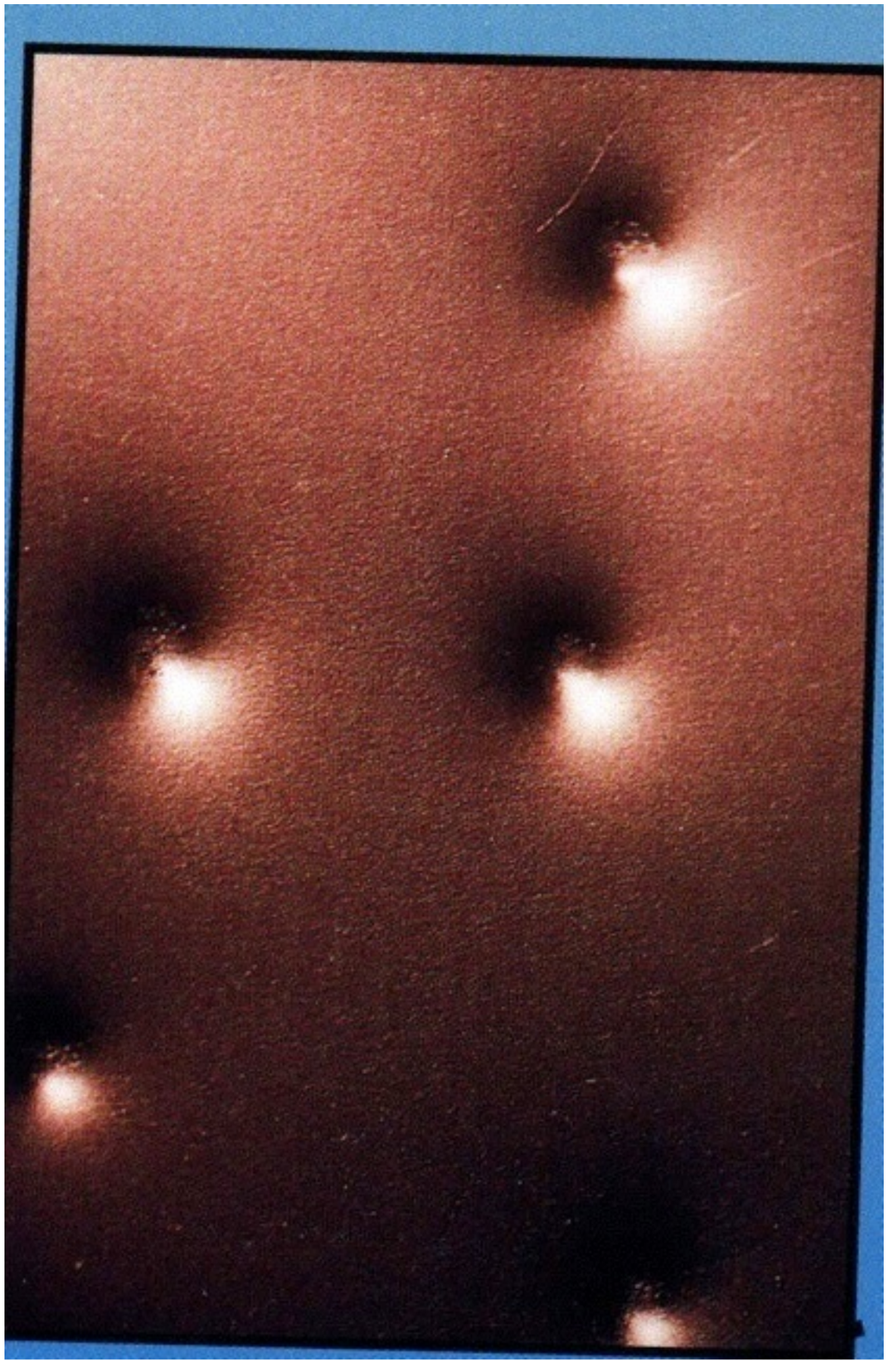

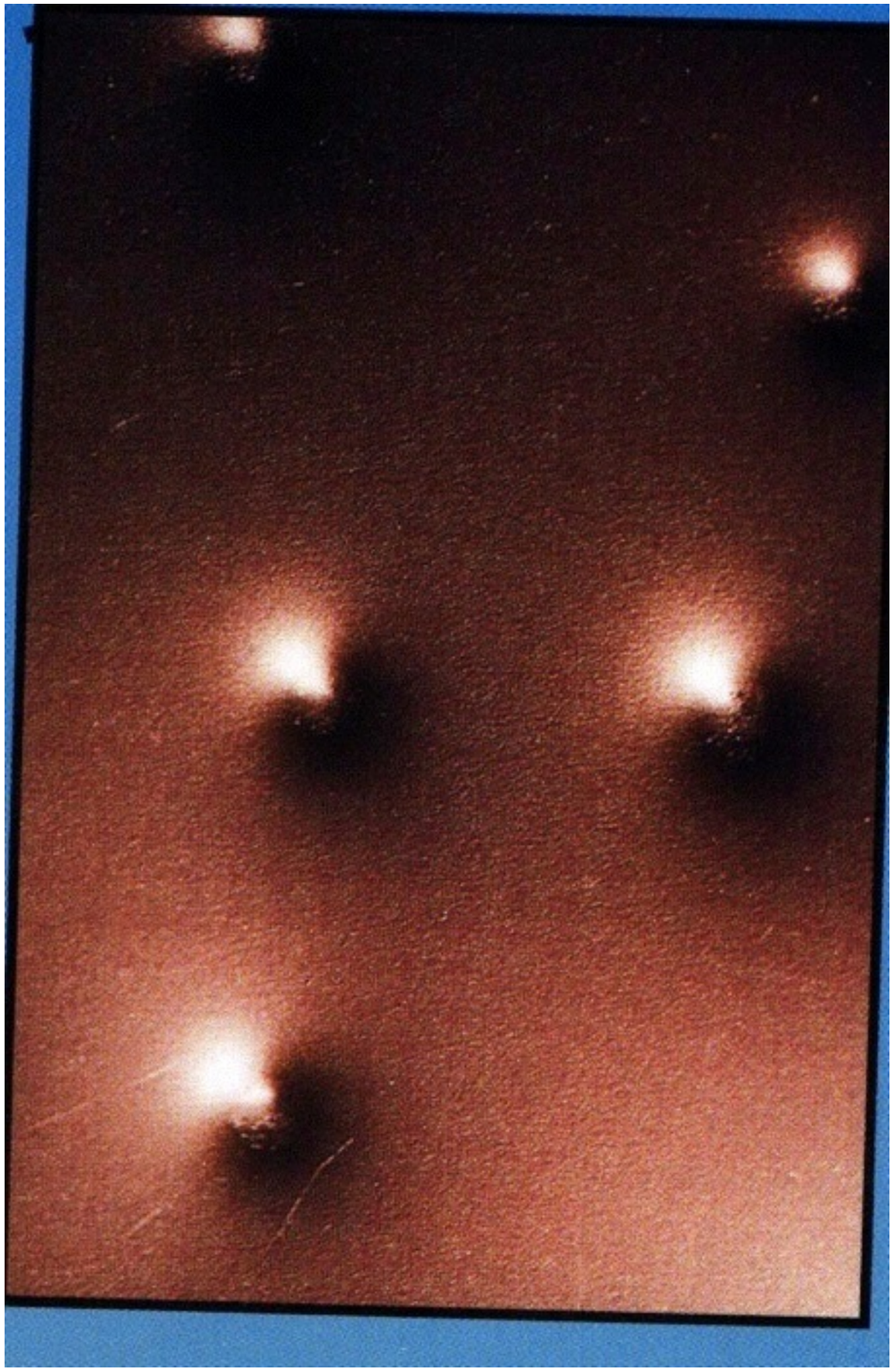

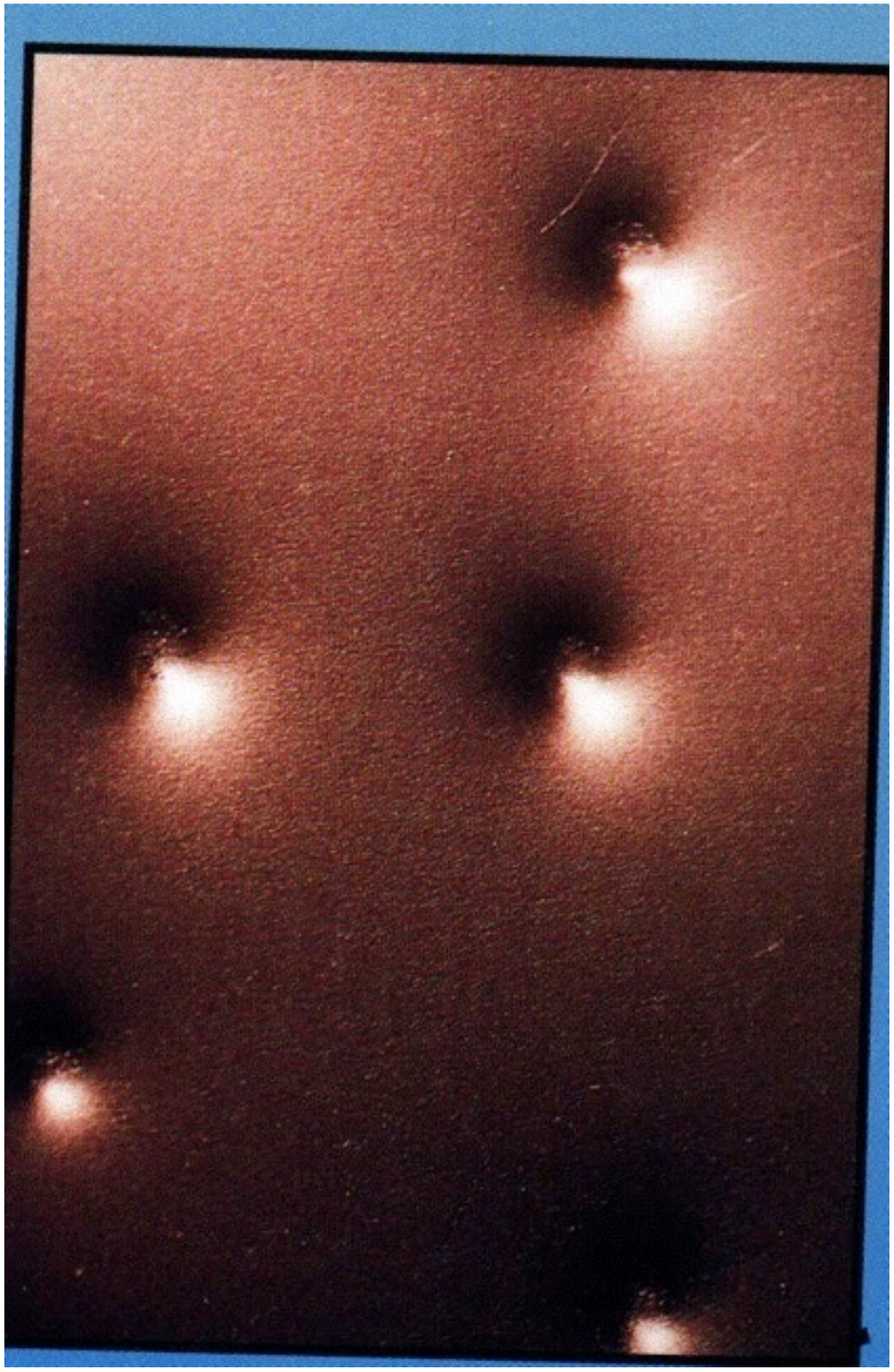

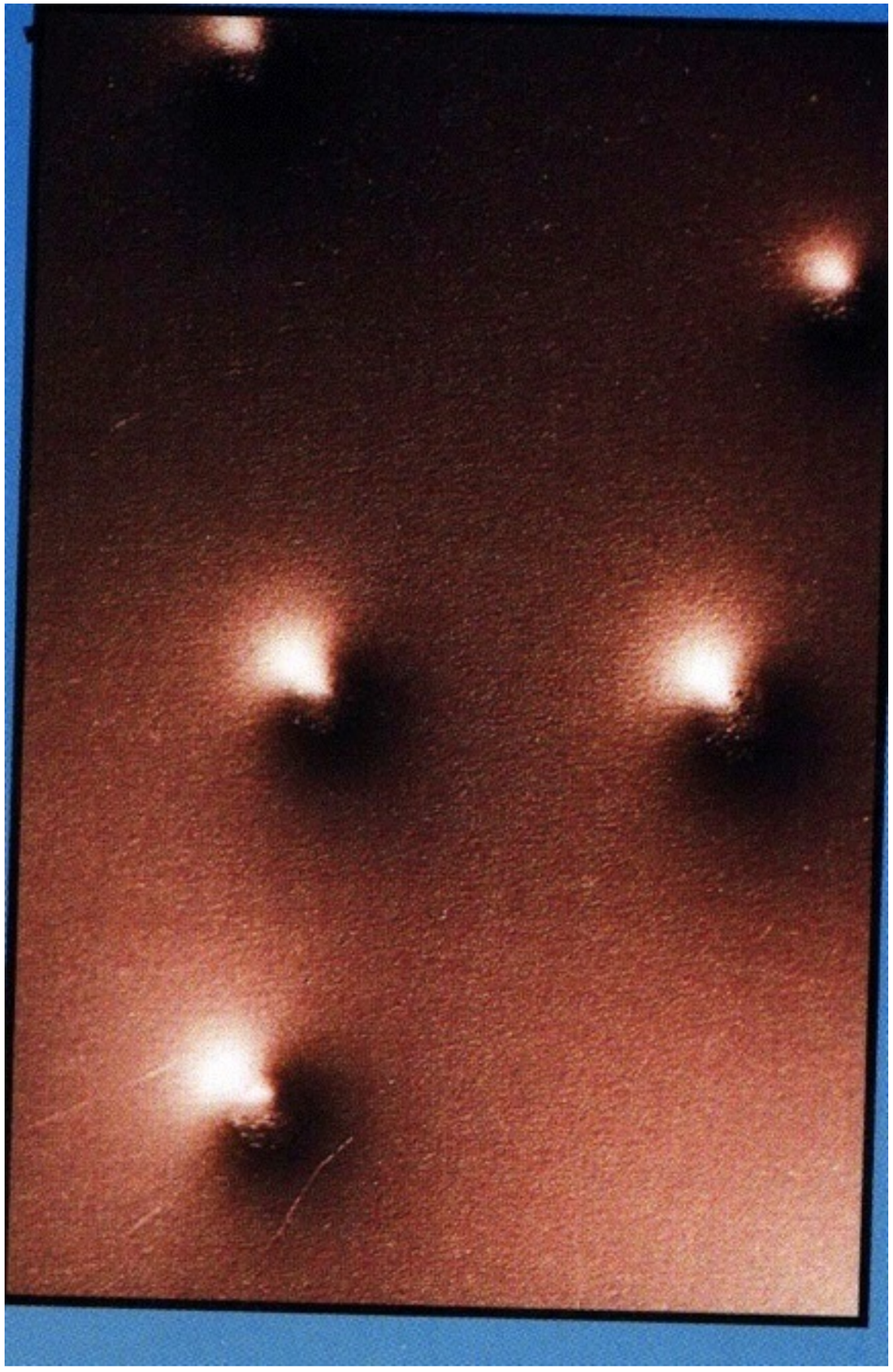

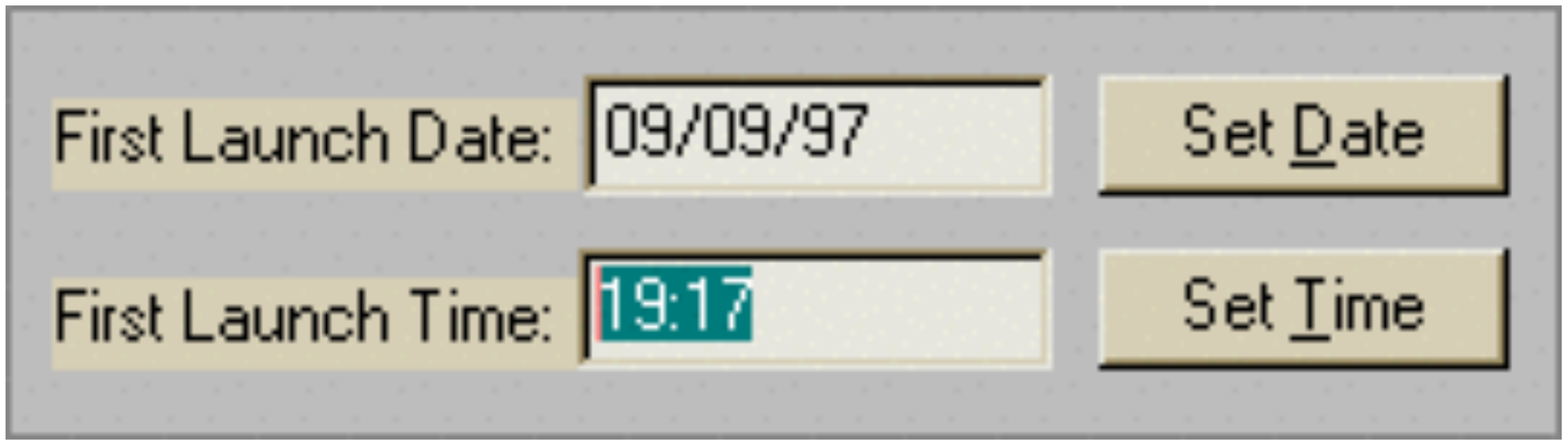
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Unconscious Influences

Known and well documented biases

- The availability biases
  - Ease of Recall
  - Retrievability
  - Presumed Associations
- Representative Biases
  - Insensitivity to Base Rates
  - Insensitivity to Sample Size
  - Misconceptions of Chance
  - Regression to the Mean
  - The Conjunction Fallacy/ Plausibility Bias
- The Confirmation Bias
  - Outcome Bias
  - Hindsight Bias
  - Correlation equal Causation Bias
  - Anchor & Adjustment Bias
  - The Heuristic Effect
  - Attribute Substitution
  - Reality First

The Cognitive Reflexive Test

A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball.

How much does the ball cost?

If it takes 5 machines 5 minutes to make 5 widgets.

How long would it take 100 machines to make 100 widgets?

In a lake, there is a patch of lily pads. Every day, the patch doubles in size.

If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball.

How much does the ball cost?

Answer: The ball costs $.05 Which means the bat costs $1.05, otherwise the difference is not $1.

If it takes 5 machines 5 minutes to make 5 widgets.

How long would it take 100 machines to make 100 widgets?

Answer: 5 minutes - the rate is 1 widget every 5 minutes per machine, so the rate is now 1 every 5 minutes X 100 machines.

In a lake, there is a patch of lily pads. Every day, the patch doubles in size.

If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

Answer: 47 days. The size doubles each day, so it its completely covered in 48 days, it was 1/2 that size the day before.

Anchoring Effect

- The effect of anchoring, known is the anchoring index, is approximately 50%. In other words, the anchoring effect accounts for 50% of the error between the point that would be selected if no anchoring had been provided and the point that is provided with the anchor. This is independent of domain knowledge, which makes it all the more insidious.

- When real estate agents were tested and asked to determine the actual selling price of the home after being told the asking price, but provided with both a low and high anchor point, the effect of anchoring was measured at 41%. These professionals claimed that they were not effected by the asking price. When the same study was conducted with college students with no background in home sales, the effect was measured to be 48%. However, this group were aware they were effects.

- People who are instructed to shake their head when they hear an anchor point tend to move farther away from the anchor point in negotiations then when people are asked to nod there head when they hear the same anchor point.

Priming

FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITH THE EXPERIENCE OF MANY YEARS

The Reality First Bias

- Feelings are from outside stimulus. When we imagine how we would feel, this is a pre-feeling. But we use our current feelings before our pre-feelings. As a result, when asked questions, we integrate our current state into our answers, even if its unrelated.

- If you ask a person who just worked out on a treadmill if they would be more hungry or more thirsty when lost in the woods, they are more likely to report thirsty (91%) versus people who did not just work out on a treadmill (60%)

- If asked about our lives when it's raining, people report lives that are worse then when the weather is nice.

- If the last event was positive, people tend to rate the overall experience as positive. If the last event was negative, people tend to rate the overall experience as negative.

Affect Heuristic

A: Researchers had participants enter into a room for a study. In some cases, Monopoly money was present in the room or a money related screensaver was on the computer monitor. At some point during the presumed task, the researcher knocked over a jar of pencils. All participants assisted in picking up the pencils; however, those participants that “saw” money in the room picked up, on average, half as many pencils.

B: In a study, participants were asked to create 4 word sentences from 5 word sets. For some of the participants, foreword sets included words related to aging (bald, Florida, wrinkled, etc.). After the 1st task, participants were asked to walk down the hall to a 2nd room. Participants who had seen the age-related words in the 1st task walked more slowly the 2nd room.

C: In a study, half of the participants experienced a flyover simulation of a city as though from an helicopter. Half of the participants experienced a flyover simulation of the city as though they were flying like Superman. At some point during the presumed task, the researcher knocked over a jar of pencils. The “Superman group” picked up more pencils and started helping sooner than the group that flew over in a helicopter.

Other Unconscious Influence Examples

- 2013 Harvard study showed that people were more assertive after using a larger device (an iPad) then after using a smaller device (an iPhone).

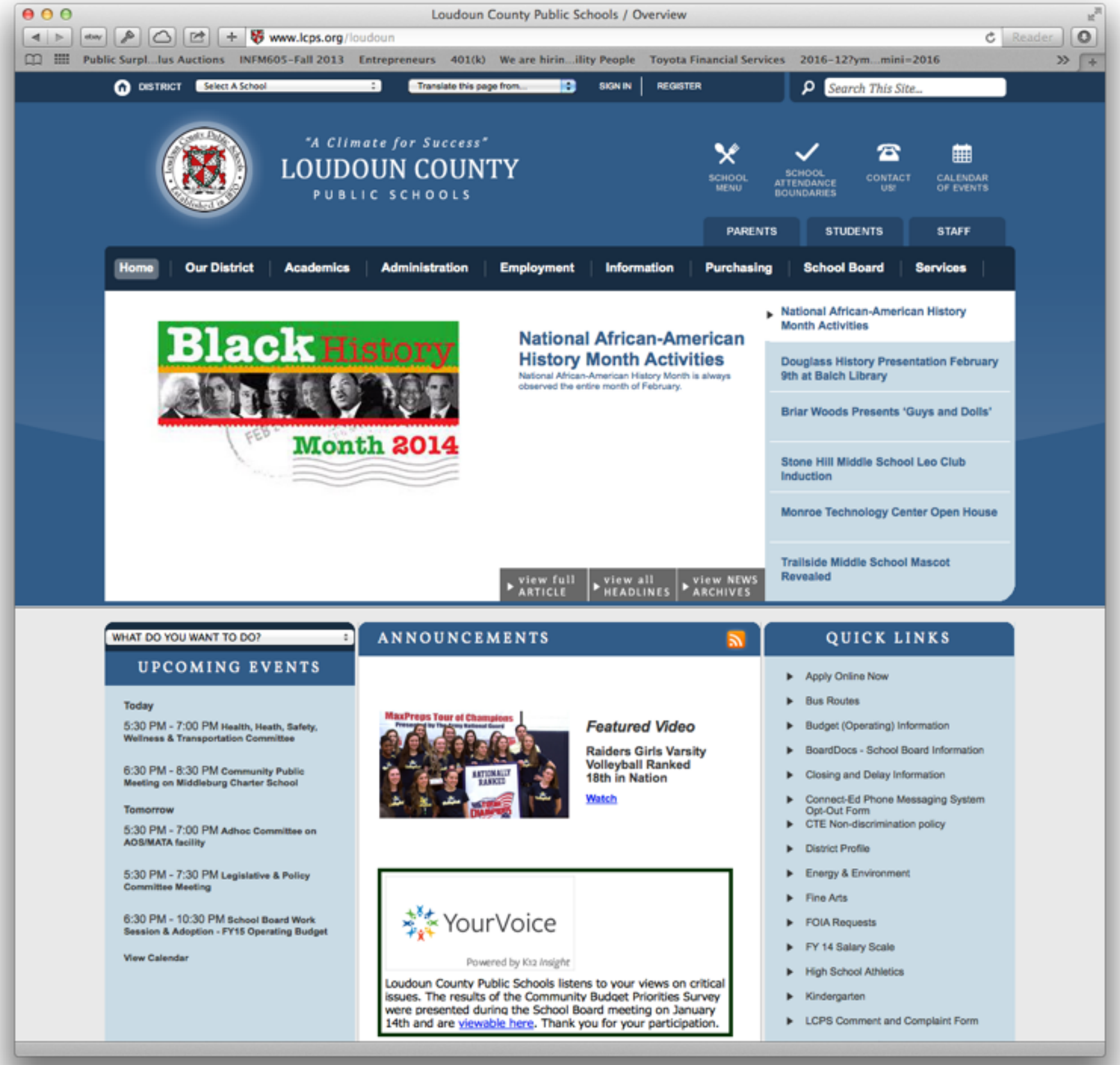
- J.Lo. and JZ's relationship was thought more likely to end when people were sitting on a wobbly chair

- People holding cold drinks rate people as more aloof, but people are seen as more friendly when holding a warm drink

Interaction Design

- The goal of interaction design is to allow product interaction (*how* we do what we are doing) to occur (ideally) as all non conscious (level 1) thinking, thus allowing our limited, single threaded conscious attention to focus on the goal (*what* we are doing). Ideally, this would be to the point we don't even notice the device we used to get the job done.

- The less often we have to redirect our attention from our task to attend to how we accomplish the task, the more *transparent* the product design, the easier it is to use, the less errors we make, the faster we work, the happier we are.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Black History Month 2014
National African-American History Month Activities
National African-American History Month is always observed the entire month of February.
National African-American History Month Activities
Douglass History Presentation February 9th at Balch Library
Briar Woods Presents 'Guys and Dolls'
Stone Hill Middle School Leo Club Induction
Monroe Technology Center Open House
Trailside Middle School Mascot Revealed
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WHAT DO YOU WANT TO DO?
UPCOMING EVENTS
Today
5:30 PM - 7:00 PM Health, Heath, Safety, Wellness & Transportation Committee
6:30 PM - 8:30 PM Community Public Meeting on Middleburg Charter School
Tomorrow
5:30 PM - 7:00 PM Adhoc Committee on AOS/MATA facility
5:30 PM - 7:30 PM Legislative & Policy Committee Meeting
6:30 PM - 10:30 PM School Board Work Session & Adoption - FY15 Operating Budget
View Calendar
ANNOUNCEMENTS
MaxPreps Tour of Champions
Featured Video
Raiders Girls Varsity Volleyball Ranked 18th in Nation
Watch
YourVoice
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Loudoun County Public Schools listens to your views on critical issues. The results of the Community Budget Priorities Survey were presented during the School Board meeting on January 14th and are viewable here. Thank you for your participation.
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Bus Routes
Budget (Operating) Information
BoardDocs - School Board Information
Closing and Delay Information
Connect-Ed Phone Messaging System Opt-Out Form
CTE Non-discrimination policy
District Profile
Energy & Environment
Fine Arts
FOIA Requests
FY 14 Salary Scale
High School Athletics
Kindergarten
LCPS Comment and Complaint Form

About / Parent Information tab

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- Directions
- District Profile
- School Hours
- Closing and Delay Information
- Parent Liaison
- 2014 Graduation Dates
- 2013-2014 Student Calendar
- 2013-14 Calendario Escolar Estudiantil
- 2013-2014 Teacher & Staff Calendar
- 2013-2014 Key Dates Calendar
- 2014 - 15 Student Calendar

Home > Our District > About

Parent Information

(Click on link to view information)

- Academic Program of Studies (high school and middle school)
- Assistive Technology
- Bullying Prevention and Awareness
- Bus Schedules
- Calendar
- Career and Transition Services
- CAMPUS
- CAMPUS (Spanish)
- Child Find Center
- Closing and Delays
- Connect-Ed Opt Out Form
- Diagnostic and Prevention Services
- District Information Profile
- Driver Education (Behind-the-Wheel) Information
- Elementary School Report Card Manuals
- Eligiblity for Special Education and Section 504
- Epinephrine Administration Policy
- FOIA Request
- FAQ's on Virginia High School League (VHSL) Transfer Rule
- Kindergarten Information
- Home Instruction
- LCPS Complaint Form
- Loudoun Education Foundation (LEF)
- Loudoun Education Alliance of Parents (LEAP)
- Loudoun School - Business Partnerships
- Medication at School
- Minority Student Achievement Advisory Committee
- Online Fee Payments
- Online Mathematics Resources
- Parent Emergency Guide (English)
- Parent Emergency Guide (Spanish)
- Parent Information Management System (PIMS)
- Parent Resource Center
- Positive Behavioral Interventions and Supports (PBIS)
- Promotion and Retention Guide
- Reconsideration of Instructional Materials Request
- School Counseling Services
- School Board Policy 6-21 Appeal Form (New Posting)
- Speaking to the School Board
- Student Registration
- Special Education Advisory Committee
- Special Permission
- Sports Physical Registration
- Summer School Registration
- Student Health Services
- Substance Abuse Prevention Program
- Tranfer to Under-Enrolled Schools Policy

Last Modified on December 3, 2013

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PSAT - Academy of Science Applicants Only (LCPS Students)

PSAT - Academy of Science Applicants Only (Non-LCPS Students)

Student Athletic Fees

Student Behind The Wheel

Student Parking

Student Parking - Monroe Tech Center

Transcript Fee-FORMER STUDENTS ONLY

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Summer School Payment

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Step 1: Select the items you would like to pay for
Available Items
To add an item to the shopping cart: click on the item then click on the 'Add selected item' button or drag the item to the shopping cart.
Item
Description
Cost
AOS AB Calculus - AP w/ Statistics (Academy of Science Students Only)
Advanced Placement Course
$83.41
AOS BC Calculus - AP w/Statistics (Academy of Science Students Only)
Advanced Placement Course
$83.41
AOS Biology - AP (Academy of Science Students Only)
Advanced Placement Course
$83.41
AOS Chemistry - AP (Academy of Science Students Only)
Advanced Placement Course
$83.41
AOS Environmental Science - AP (Academy of Science Students Only)
Advanced Placement Course
$83.41
AOS Physics - AP (Academy of Science Students Only)
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$83.41
Biology - AP
Advanced Placement Course
$83.41
Calculus AB - AP
Advanced Placement Course
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Calculus BC - AP
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Chemistry - AP
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$83.41
Comparative US Government - AP
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$83.41
Computer Science A - AP
Advanced Placement Course
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Economics - Macro - AP
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Economics - Micro - AP
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Environmental Science - AP
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European History - AP
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German - AP
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Human Geography - AP
Advanced Placement Course
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Language & Composition - AP
Advanced Placement Course
$83.41
Latin - AP
Advanced Placement Course
$83.41
Literature & Composition - AP
Advanced Placement Course
$83.41
Music Theory - AP
Advanced Placement Course
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Physics C - AP
Advanced Placement Course
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Psychology - AP
Advanced Placement Course
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Spanish - AP
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Statistics - AP
Advanced Placement Course
$83.41
Studio Art - AP
Advanced Placement Course
$83.41
U.S. Government & Politics - AP
Advanced Placement Course
$83.41
U.S. History - AP
Advanced Placement Course
$83.41
World History - AP
Advanced Placement Course
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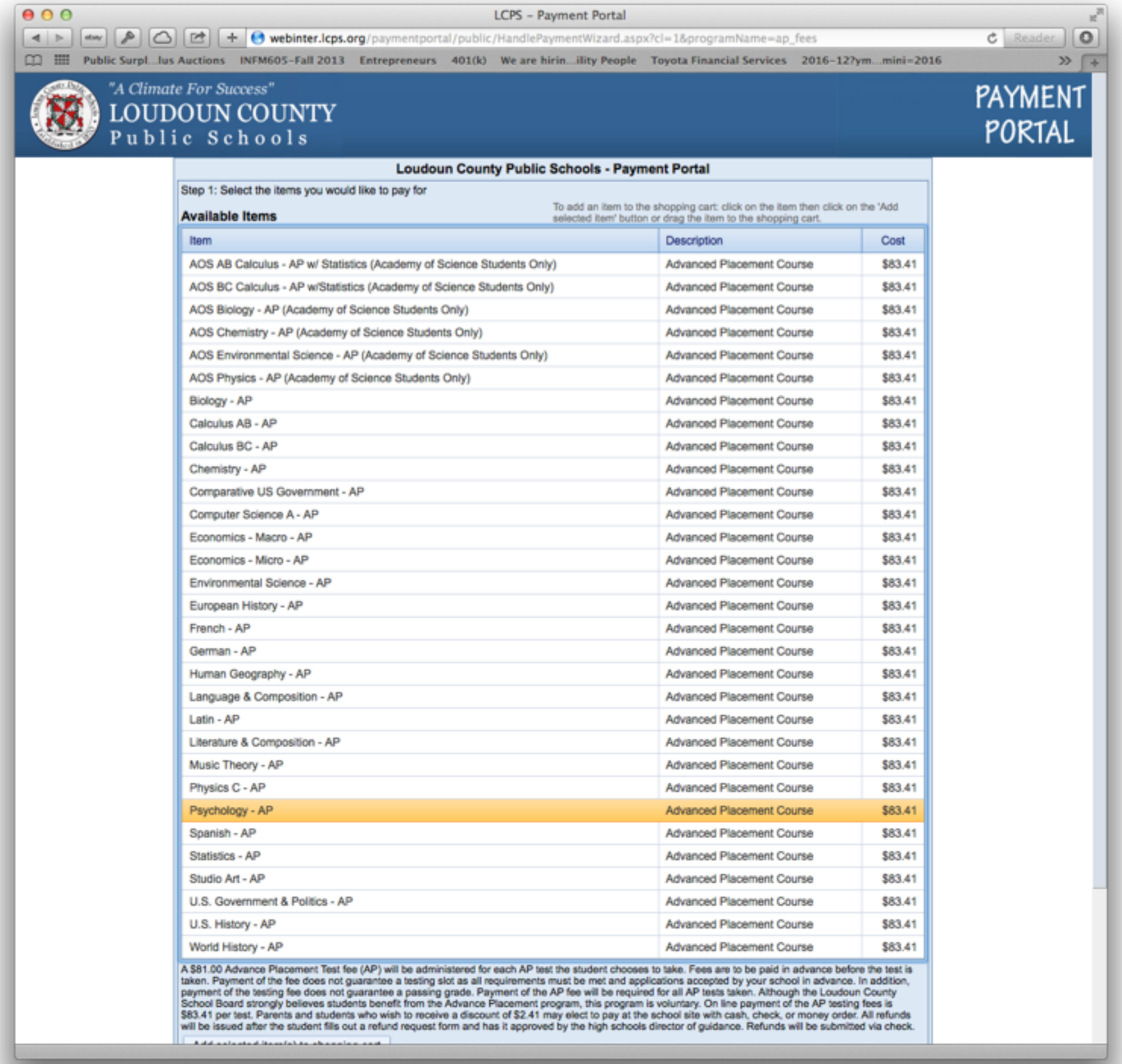
A $81.00 Advance Placement Test fee (AP) will be administered for each AP test the student chooses to take. Fees are to be paid in advance before the test is taken. Payment of the fee does not guarantee a testing slot as all requirements must be met and applications accepted by your school in advance. In addition, payment of the testing fee does not guarantee a passing grade. Payment of the AP fee will be required for all AP tests taken. Although the Loudoun County School Board strongly believes students benefit from the Advance Placement program, this program is voluntary. On line payment of the AP testing fees is $83.41 per test. Parents and students who wish to receive a discount of $2.41 may elect to pay at the school site with cash, check, or money order. All refunds will be issued after the student fills out a refund request form and has it approved by the high schools director of guidance. Refunds will be submitted via check.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French - AP
Advanced Placement Course
$83.41
German - AP
Advanced Placement Course
$83.41
Human Geography - AP
Advanced Placement Course
$83.41
Language & Composition - AP
Advanced Placement Course
$83.41
Latin - AP
Advanced Placement Course
$83.41
Literature & Composition - AP
Advanced Placement Course
$83.41
Music Theory - AP
Advanced Placement Course
$83.41
Physics C - AP
Advanced Placement Course
$83.41
Psychology - AP
Advanced Placement Course
$83.41
Spanish - AP
Advanced Placement Course
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Statistics - AP
Advanced Placement Course
$83.41
Studio Art - AP
Advanced Placement Course
$83.41
U.S. Government & Politics - AP
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U.S. History - AP
Advanced Placement Course
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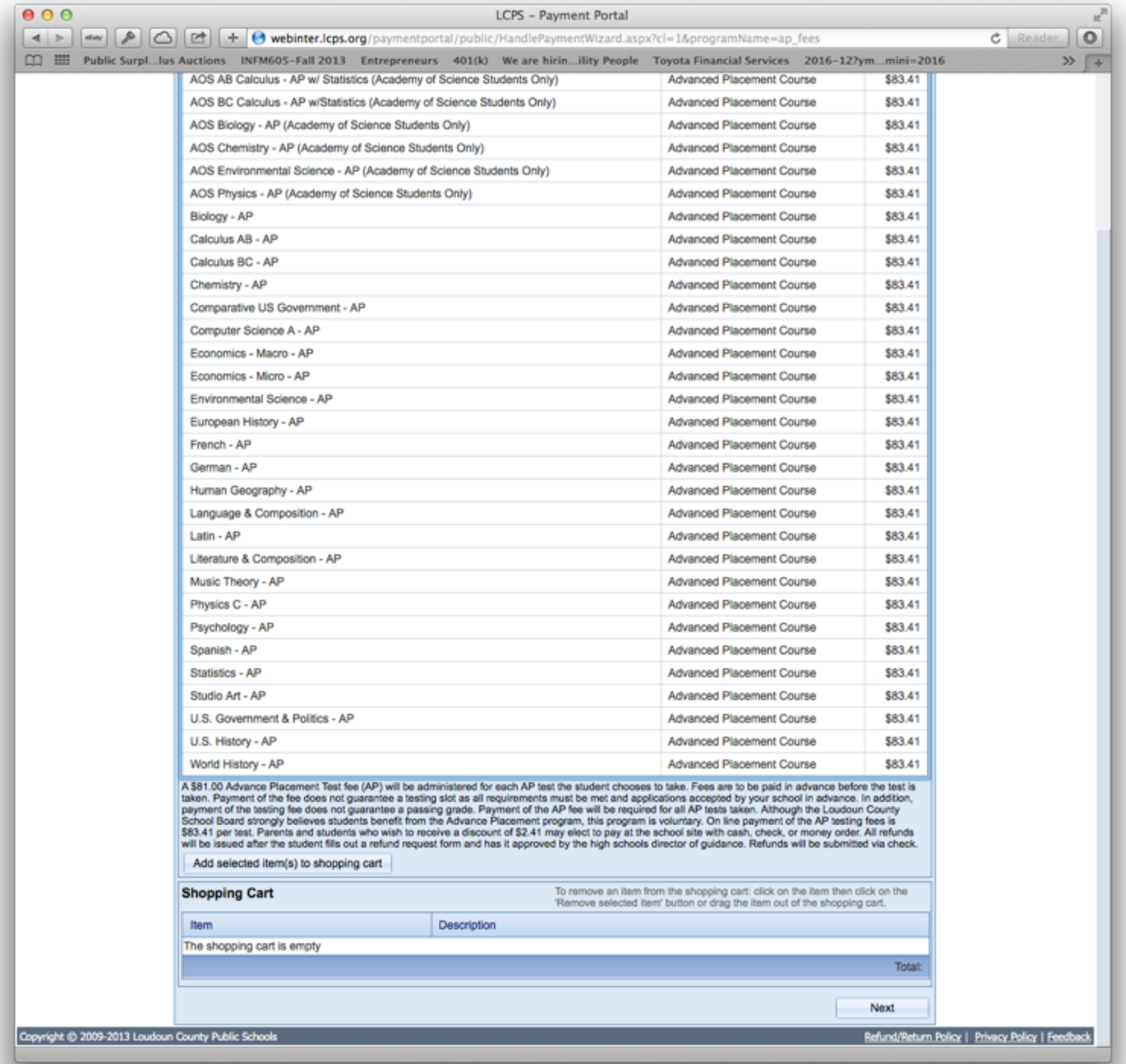
World History - AP
Advanced Placement Course
$83.41
A $81.00 Advance Placement Test fee (AP) will be administered for each AP test the student chooses to take. Fees are to be paid in advance before the test is taken. Payment of the fee does not guarantee a testing slot as all requirements must be met and applications accepted by your school in advance. In addition, payment of the testing fee does not guarantee a passing grade. Payment of the AP fee will be required for all AP tests taken. Although the Loudoun County School Board strongly believes students benefit from the Advance Placement program, this program is voluntary. On line payment of the AP testing fees is $83.41 per test. Parents and students who wish to receive a discount of $2.41 may elect to pay at the school site with cash, check, or money order. All refunds will be issued after the student fills out a refund request form and has it approved by the high schools director of guidance. Refunds will be submitted via check.


LCPS – Payment Portal
webinter.lcps.org/paymentportal/public/HandlePaymentWizard.aspx?cl=1&programName=ap_fees
AOS AB Calculus - AP w/ Statistics (Academy of Science Students Only) Advanced Placement Course $83.41
AOS BC Calculus - AP w/Statistics (Academy of Science Students Only) Advanced Placement Course $83.41
AOS Biology - AP (Academy of Science Students Only) Advanced Placement Course $83.41
AOS Chemistry - AP (Academy of Science Students Only) Advanced Placement Course $83.41
AOS Environmental Science - AP (Academy of Science Students Only) Advanced Placement Course $83.41
AOS Physics - AP (Academy of Science Students Only) Advanced Placement Course $83.41
Biology - AP Advanced Placement Course $83.41
Calculus AB - AP Advanced Placement Course $83.41
Calculus BC - AP Advanced Placement Course $83.41
Chemistry - AP Advanced Placement Course $83.41
Comparative US Government - AP Advanced Placement Course $83.41
Computer Science A - AP Advanced Placement Course $83.41
Economics - Macro - AP Advanced Placement Course $83.41
Economics - Micro - AP Advanced Placement Course $83.41
Environmental Science - AP Advanced Placement Course $83.41
European History - AP Advanced Placement Course $83.41
French - AP Advanced Placement Course $83.41
German - AP Advanced Placement Course $83.41
Human Geography - AP Advanced Placement Course $83.41
Language & Composition - AP Advanced Placement Course $83.41
Latin - AP Advanced Placement Course $83.41
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Add selected item(s) to shopping cart
Shopping Cart
To remove an item from the shopping cart: click on the item then click on the 'Remove selected item' button or drag the item out of the shopping cart.
Item
Description
The shopping cart is empty
Total:
Next
Copyright © 2009-2013 Loudoun County Public Schools
Refund/Return Policy | Privacy Policy | Feedback

Testing Goals

System 2 Testing

- Functional discoverability
- Ease of Learning (Intuitiveness)
  - Obvious visual affordances
  - Conforming ot industry standards and best practices or a clear and useful violation
  - Consistentcy of percepts
- Minimal cognitive demand

System 1 Testing

- Ease of use
  - Good conceptual model
  - Good use of Gestalt principles
  - Good positional feedback
- Ease of recall (hard to test)
- Safety

Testing Applications

- If the task is to perform a specific function (buy a product, get direction, etc.), then operating the system and performing the task are highly integrated
- Tasks and sub-tasks are easy to define (locate a specific product, add items to a shopping cart, update a shopping cart, locate contact info, find directions between 2 specific locations, etc.)
- Task and subtask success is easily measured (success or failure)
- This is the simplest type of product to test.

Testing: Information Systems

- If the task is information-based, it has one of several purposes
  - gain knowledge
  - be persuaded
  - assist in decision making
  - get trained
- Part of the task is simple (locate the information)
- But true success (the effect of the info on the user) is not easy to measure

Psychology Issues in Testing

Observer Effect/Social Facilitation

Any of a general class of changes to a user's behavior as the results of being observed (or thinking they are being observed).

The Heisenberg Principle of usability testing.

Most well know is the Hawthorne Effect

Causes a divergence in performance - the good do better, the poor do worse

Projected Responding

Respondents believe they understand the goal of the project and attempt to provide the information they think is being asked for

Almost unavoidable. Encouraged by subtle differences in responses (correctly or incorrectly) perceived. Why its extremely hard to test your own designs. And why you NEVER take notes in the participants's presence.

Confabulation

If System 2 does not have access to the information of system 1, it will use logic to answer the question even if its incorrect.

In a split brain study, people were shown a picture of a chicken's leg and a picture of a car covered in snow and then asked to point to a related picture in a set. People pointed to either a picture of a chicken or a picture of a snow shovel. If the image was shown to the left hemisphere, they could describe the reason why they pointed to this picture. If the picture was shown to the right hemisphere, they pointed to the picture but could not explain why.

When participants were shown the picture of a chicken's leg to the left hemisphere and a picture of the car in snow to the right hemisphere at the same time, they would point to the same 2 pictures. When asked why they pointed to the picture of the shovel, participants reported that chickens produce a lot of chicken poop, so you need a shovel to clean it up.

Answer Substitution

You are shown a picture of a person running for office and asked if you think they will win. There are far to many variables for you to make a good prediction, so the task is too hard for system 2 to work out.

System 1 substitutes the hard question for an easier one – does the person look like a person who will win?

System 1 provides an answer to that new question, but System 2 reports it as the answer to the first question without realizing the substitution.

Performance Anxiety

Testing Methods

Part 1: Non-User Based Testing

Compliance Testing

- The Spelling and Grammar checker of usability testing
- Possible (within limits) to be performed by anyone
- Can remove the low level usability issues that often mask more significant usability issues

Compliance Testing (concluded)

- Style Guide-based Testing
  - Checklists
  - Interpretation Issues
  - Scope Limitations
- Available Standards
  - Commercially GUI & Web Standards and Style Guides
  - Domain Specific GUI & Web Standards and Style Guides
  - Internal Standards and Style Guides
- Interface Specification Testing*

*Special Case of QC Testing that assumes a usable design to start with

Expert Review

Some people look at this picture and see a monster.

We look at it and see low shutter speed and an incorrect F-stop. Kodak.

Heuristic Evaluation Guudelines

- Nielson's 10 Most Common Mistakes Made by Web Developers (three versions)
- Shneiderman's 8 Golden Rules
- Constantine & Lockwood Heuristics
- Forrester Group Heuristics
- Norman's 4 Principles of Usability

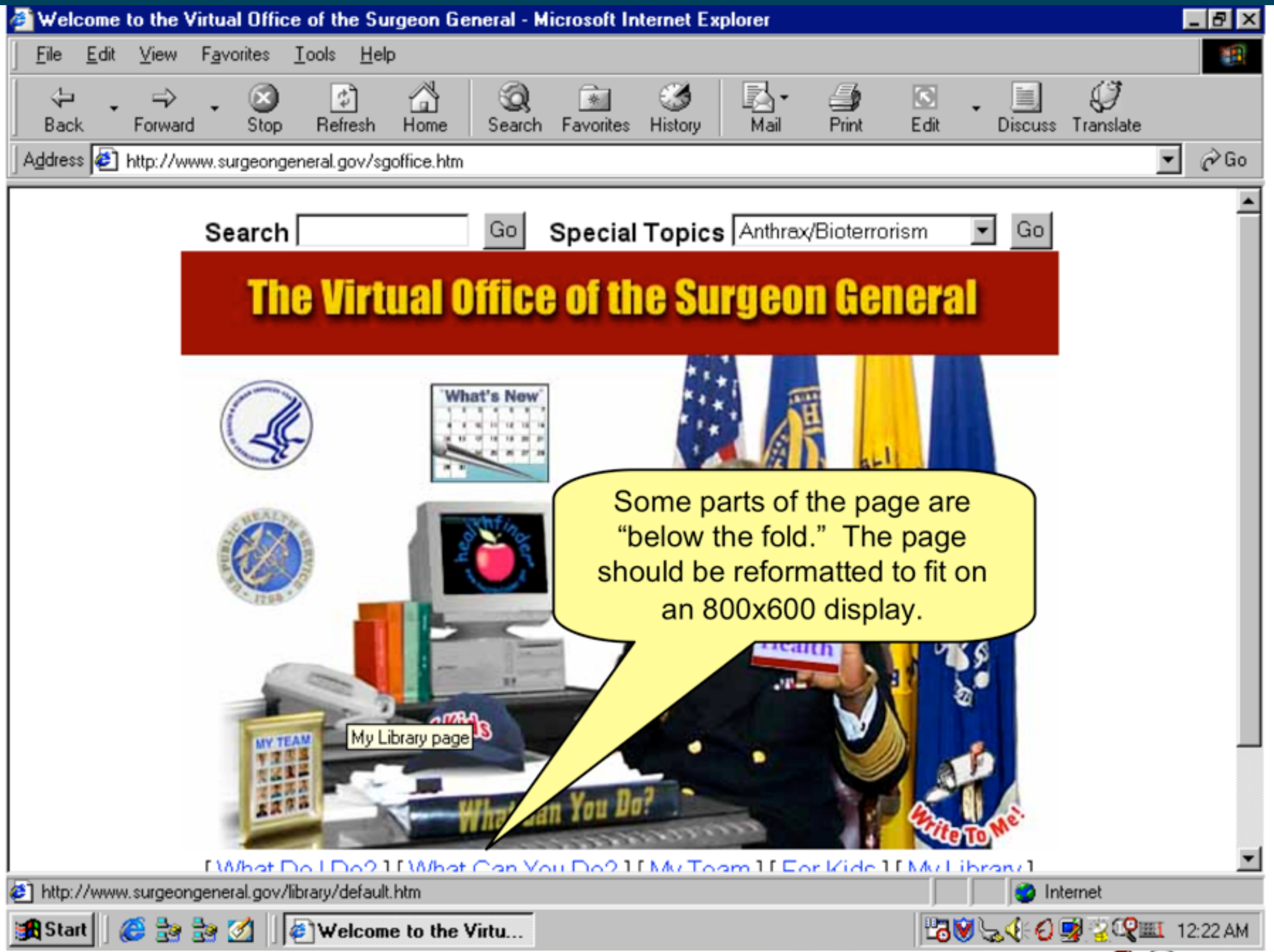
Expert Review

- One or more usability experts review a product, application, etc.
- Subjective but based on sound usability and design principles
- Highly dependent on the qualifications of the reviewer(s)

1st Heuristic

Functional discoverability through obvious interactive elements and adequate feedback

J.K.Rowling
official site


Welcome to the Virtual Office of the Surgeon General - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss Translate
Address http://www.surgeongeneral.gov/sgoffice.htm
Go
Search Go
Special Topics Anthrax/Bioterrorism Go
The Virtual Office of the Surgeon General
What's New
Some parts of the page are "below the fold." The page should be reformatted to fit on an 800x600 display.
My Library page
Write To Me!
[What Do I Do?] [What Can You Do?] [My Team] [For Kids] [My Library]
http://www.surgeongeneral.gov/library/default.htm
Internet
Start
Welcome to the Virtu...
12:22 AM

2nd Heuristic

A good, complete, and unambiguous cognitive (or conceptual) model to predict the effects of our actions


Recycle Bin Icon


FREE 2-Day Shipping, No Minimum Purchase
Gift Cards
Your Account | Help
GO
Cart
Your Lists
Amazon Daily BLOG
7 posts since yesterday
Posts for Bill
rrived
onger battery
New iPod shuffles Announced
The new iPod shuffles, available in black or silver, store up to

ORHAM'S

CONTRACTORS DEPOT

Item Number

Go!

Advanced Search

Search for goods

David Burt / *dgburt*

	Criteria		Value	
Search:	Item Description	Like	cement	Go!

My Jobs
Sub Jobs
Select Goods
Orders
Quotes
Departments
Reports
Change Password
Logout

Search Results

001336	PW-45 HEATER REPLACEMENT WICK **Retail:**$ 10.79 **Specification: PW-45 HEATER REPLACEMENT WICK** PW-45 HEATER REPLACEMENT WICK Substitute Items Related Items	PLACE ITEMS HERE
015935	PW-12 HEATER REPLACEMENT WICK **Retail:**$ 9.19 **Specification: PW-12 HEATER REPLACEMENT WICK** PW-12 HEATER REPLACEMENT WICK Substitute Items Related Items	PLACE ITEMS HERE
015852	PW-68 HEATER REPLACEMENT WICK **Retail:**$ 13.59 **Specification: PW-68 HEATER REPLACEMENT WICK** PW-68 HEATER REPLACEMENT WICK Substitute Items Related Items	PLACE ITEMS HERE

3rd Heuristic

Design for the intended users (and not yourself)


CD-RW

The Game of 15s

Let's play the game of "15." The pieces of the game are the numbers 1, 2, 3, 4, 5, 6, 7, 8, and 9. Each player takes a digit in turn. Once a digit is taken, the other player cannot use it. The first player to get three digits that sum to 15 wins.

Here's a sample game: Player A takes 8. Player B takes 2. Then A takes 4, and B takes 3. A takes 5. What digit should B take?

X	O	X
	X	
O		

~~4~~	3	~~8~~
9	~~5~~	1
2	7	6

Framing Problem to Match our Abilities

- The rule to test: If a card has an even number on its face, its has a primary color on its opposite face.

- How many cards in the next slide do you need to look at to confirm this rule is being followed?

5	Purple	8	Red

Framing Problem to Match our Abilities 2

- The rule to test: You cannot drink alcohol if you are under 18.
- How many cards in the next slide do you need to look at to confirm this rule is being followed?

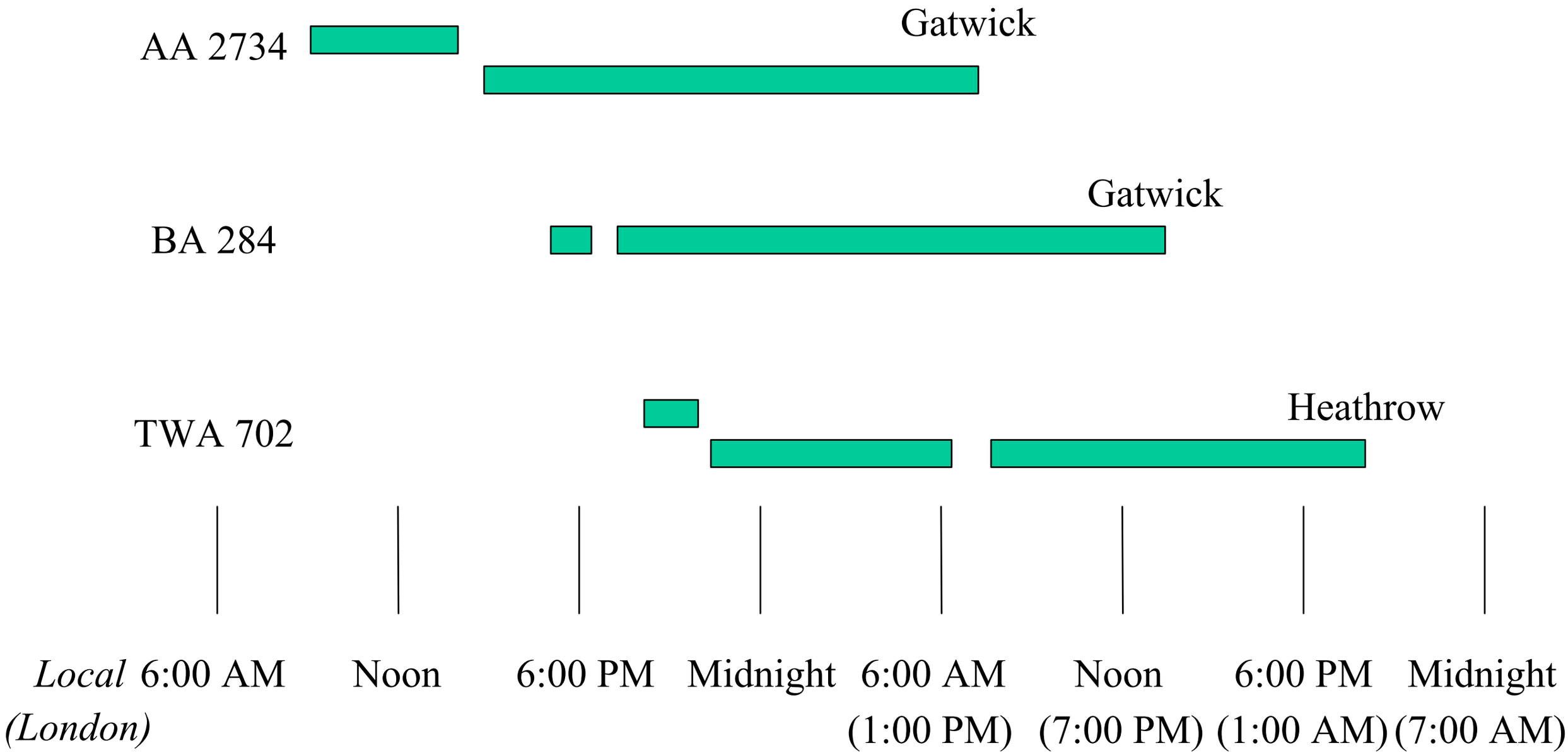

33
Tequila
16
Sprite
1
2
3
4

The Results from Research

The correct answer is that you need only check 2 cards - the second and thirds cards in both problems (8 and purple or Tequila and 16).

Less then 1/4 of people solve this problem when framed in colors and numbers, but virtually everyone gets the problem correct when framed as ages and drinks.

	1131	SAN	0820+1	LGW	AA	2734	FCYBM	D10	1
		AA	2734	CHG PLANE AT DFW					
X12	1805	SAN	1425+1	LGW	BA	284	FJMSB	D10	1
	2100	SAN	2030+1	LHR	TW	702	FCYBQ	*	2
		TW	702	EQUIPMENT 767 LAX L-10					


AA 2734
Gatwick
BA 284
Gatwick
TWA 702
Heathrow
Local 6:00 AM
Noon
6:00 PM
Midnight
6:00 AM
Noon
6:00 PM
Midnight
(London)
(1:00 PM)
(7:00 PM)
(1:00 AM)
(7:00 AM)

4th Heuristic

Design for Errors (Slips)

Error versus Slip

- Errors are generated by a lack of understanding or a lack of sufficient or correct information
  - Lack of sufficient or correct information is the responsibility of the designer in the presentation layer of an interface
  - Lack of understanding is the responsibility of the designer in interaction and in conceptual model of an interface
  - Errors are often undetectable by the end user
- Slips are common users issues
  - Hand/eye coordination or basic control of our psychomotor systems
  - Exacerbated by distraction, speed, attention overload
  - Unavoidable by design but need to be anticipated and addressed by the designer

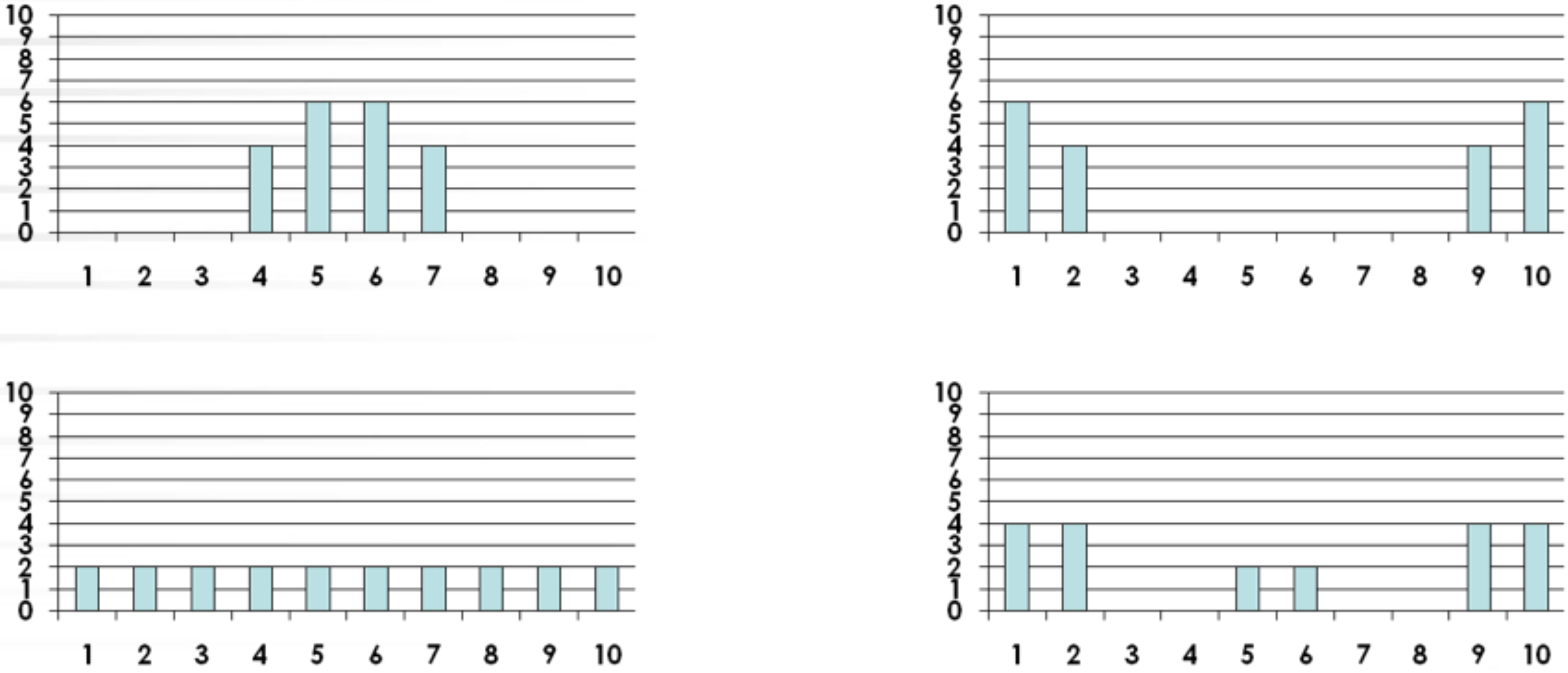
Testing Methods

Part 2: User Based Testing

A Statistics Primer

Descriptive Statistics

- But the data often shows other patterns such as bimodal distributions. In these cases, the average and standard deviation are not adequate…



Validity

- Validity is the degree to which the results of a research study provide trustworthy information about the truth or falsity of the hypothesis*
- Internal validity refers to the situation where the "experimental treatments make a difference in this specific experimental instance" (from Cambell, D.T. & Stanley, J.C. (1963) Experimental and Quasi-experimental Designs for Research
- External validity asks the question of "generalizability"

*Cherulnik, P.D. 2001. Methods for Behavioural Research: A Systematic Approach

Reliability

- Reliability is the ability of a test to show the same results if conducted multiple times
  - Test-retest reliability
  - Repeatability
  - Reproducibility

Use of Confidence Intervals

- When working with samples, a confidence interval provide a way to represent the uncertainty in test results
- Since each sample and each test is different, the confidence level tells the reader the likelihood that another sample will provide the same results. (In other words, if you ran the test again, what value are you likely to get the next time?)
- Typical confidence intervals in research include the 90% or 95% confidence interval.
- Behavioral research often uses a 80% confidence interval.

Typical Participant Sizes

- You could do statistical analysis on the results of a typical usability only if…
  - Your test as valid and reliable
  - You had truly random sampling
  - You did not interfere with performance during testing
- The research rule of thumbs is that you need a minimum of 25-30 people before you'l see data begin to regress to the mean
- Usability is typically done with very few people per round
  - Neilson says you only need 5 people (but not for the right reason)
  - Krug says you only need 2 or 3 people (also not for the right reason)
  - The IUSR and the related ISO standard says 3 per user group, profile, or persona
- A single day of testing can test with, at most, 8-9 people

Use of Confidence Intervals (concluded)

- Confidence intervals when testing with, say, 8 people range from 37% (0 out of 8 or 8 out of 8) to between 50%-70% (all other values)
  - For example, if 6 out of 8 people successfully completed a task in your test, you can only predict that somewhere between 20% and 97% of all people would complete the task (assuming all conditions for validity and reliability have been met)
  - If you want to confidently state, based on your testing, that 9 out of 10 people will be able to successfully complete a task, and all conditions needed for validity and reliability have been met, you need to test 430 people and 400 of them have to successfully complete the task

Performance-based Testing

Performance-based Testing

- Sometimes called an "Un-moderated Remote Usability Testing"
- Must be non-disruptive
  - Need a fully operational system, mock up, or prototype
  - In context (ideally not in a lab)
- Need large enough sample
- Need objective measure(s)
- Need a comparison or a benchmark
- Applicability in (some) web-based situation, however…
  - Limited ability to to determine cause
  - Limited ability to determine possible changes/improvements

The Think Aloud Protocol

Think Aloud Protocol

- Most widely used (which is not a good thing)
- Highly disruptive to performance
- No reliable evidence of its efficacy
- When used on existing systems or interactive prototypes/mockups
  - Issues of the ability for users to be introspective
  - Issues of distraction (split attention)
  - Issues of verbal overshadowing
  - Issues of increased anxiety
  - Issues of projected responding
- Suitability for concept presentation and cognitive walkthroughs on non-operational products (e.g., story boards, static screen flows, Wizard of Oz walkthroughs)

Threats to User-Based Testing

- Reactivity Effect
  - Individuals alter their performance or behavior due to the awareness that they are being observed
  - "The Hawthorne Effect" is the most widely known version
  - Bradley, Wilder
  - Demand characteristics (subtle) and projected responding (more overt)
- Issues with introspection and confabulation
- The Effect of Anxiety
  - General
  - With split attention
  - During a think aloud protocol

Interrupted Task-based Test

Interrupted Task-Based Testing

- A compromise approach that allows for exploration of issues without being overly disruptive when issues are not present
- Can be used for exploratory testing on an existing design
- Can be used for exploring possible design alternatives
- Should (Must)
  - follow the ethical guidelines for the treatment of human subjects (including informed consent), confidentiality
- Should not
  - be hampered by trying to support statistical analysis

Test Set-up

- What's the hypothesis?
  - Required for research
  - Required for usability testing?
- Define Your Variables
  - Dependent and Independent Variables
  - Confounding Variables
  - Operationalize Your Variables

Participant Issues

- User-types
  - Users versus user surrogates
  - All profiles or specific user profiles/personas?
  - Critical segments?
- How many?
  - Relationship to statistical significance
  - "Discount Usability" – who's rule?
  - No less then 3 from any group
- Participant stipends
- Over recruiting
- Scheduling

Within versus Between Subject Designs

- Based on time commitment & number of designs/ products
- Within lets everyone see both products, which is better for small scale studies
- Practically: Use an unbalanced within subject design

Defining Task Scenarios

- Scenarios are contrived for testing, may not be representative of real world usage patterns, and are NOT always required
- Short, unambiguous tasks to explore areas of concern, redesign, or of interest
- Wording is critical
  - In the user's own terms
  - Does not contain "seeds" to the correct solution
- Enough to form a complete test but able to stay within the time limit
  - Flexibility is key
  - Variations ARE allowed

Preparing Test Materials

- Consent form
  - Confidentiality
  - Anonymity
  - Time, intent, expectation from them
  - Voluntary and the right to stop
- Video release form
- Receipt and confidentiality agreement
- Facilitator's Guide
  - Introductory comments
  - Participant task descriptions
  - Questionnaires, SUS, Cooper-Harper, etc.

Piloting the Design

- Getting subjects
  - Convenience sampling
  - Cells and Power
- Collect data
- Check task wording
- Check timing

Facilitating

- Rogerian principles apply
  - Unconditional Positive Regard
  - Empathy
  - Congruence
- Rogerian techniques are used
  - Open ended questions
  - Minimal encouragers
  - Reflections
  - Summarization
- Objectiveness - never plan to test your own design

Collecting Data

- Collecting data
  - The data is NOT in the interface, the data is in the user!
  - Data is observational, not transcribable
  - Behavior, Reactions, hesitations (movement and voice), body language, “tells”
- Collecting participant comments may be misleading (e.g, confabulation), but may help indicate when issues are present (e.g., projected responding)
- Collecting subjective data (why not)
  - Pre-test
  - Post-task
  - Post-test

Other Formats

- Co-Discovery
  - 2 peoples working on a problem together
  - A highly useful hybrid approach (natural task performance and think aloud)
- Remote Usability Testing
  - Has logistical advantages
  - Generates a false assumption that its more valid
  - Doable as a think aloud, but otherwise results in a hybrid (part interrupted task based and part think aloud)
  - Much of the observational data is missing
- Eye Tracking, Physiological Measures, Blink Rates, etc.
  - Objective measures that seem more realistic, objective
  - Lack perceptual component (e.g., with eye tracking what we look directly at is not all we see, we can look directly at something and not see it, and what we perceive is not always what is in front of us)

Writing Tasks

Need to Understand the Product

- You can’t test everything
- Essentially, you have to perform an expert review first
- Decide if you are testing System 1, System 2, or both
- Determine what’s new, what’s changed or what’s critical that needs to be tested
- Determine what tasks allow you to assess potential issues with performing these tasks

Tasks Descriptions

- Write short, unambiguous, tasks that expose the use to the specific function or displays to be evaluated
  - Don't Use: "You are with a friend studying for final and getting tired. You decide its time for a cup of coffee but you don't know where the nearest coffer shop is located. Using this app, try to find the nearest coffee shop to your current location."
  - Use: "Find the nearest coffee shop"
- Don't seed the answer
  - Don't Use "Figure out how to register for the site" is there is a link called "Register"
- Have extra tasks on hand

Reporting Results

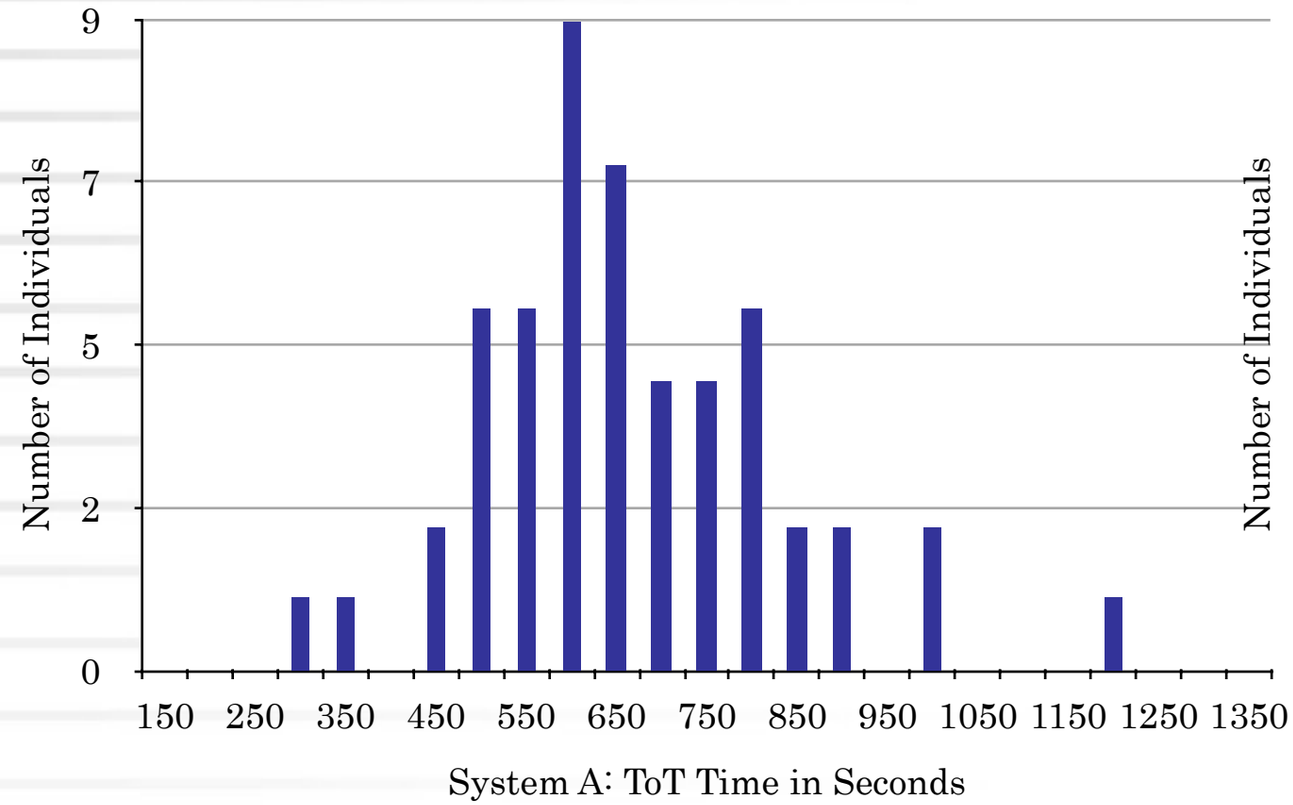
Some people look at this picture and see a monster.

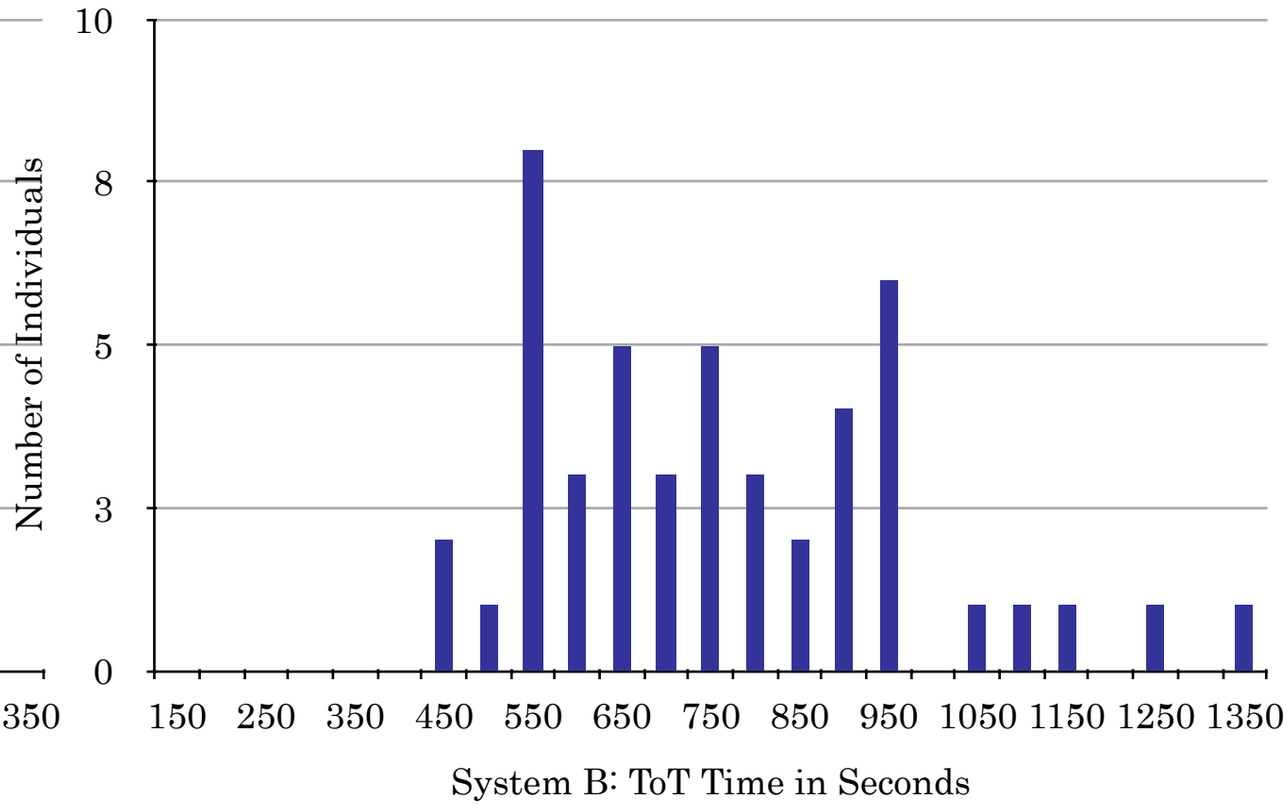
We look at it and see low shutter speed and an incorrect F-stop. Kodak.

Efficiency Data – Time on Task

- Efficiency
  - Can be operationalized in number of ways
  - Time on task being the most common
- Time on task can be measured objectively
- External time
  - Important to management and some types of engineering (particularly process flow)
  - Its not necessarily important to users
  - Time-on-task does not correlate with effectiveness except in extreme cases

Sample ToT Data – Controlled Experiment*





*Source: UCD, Inc. – Voting System Usability Compliance Test Development Report for NIST

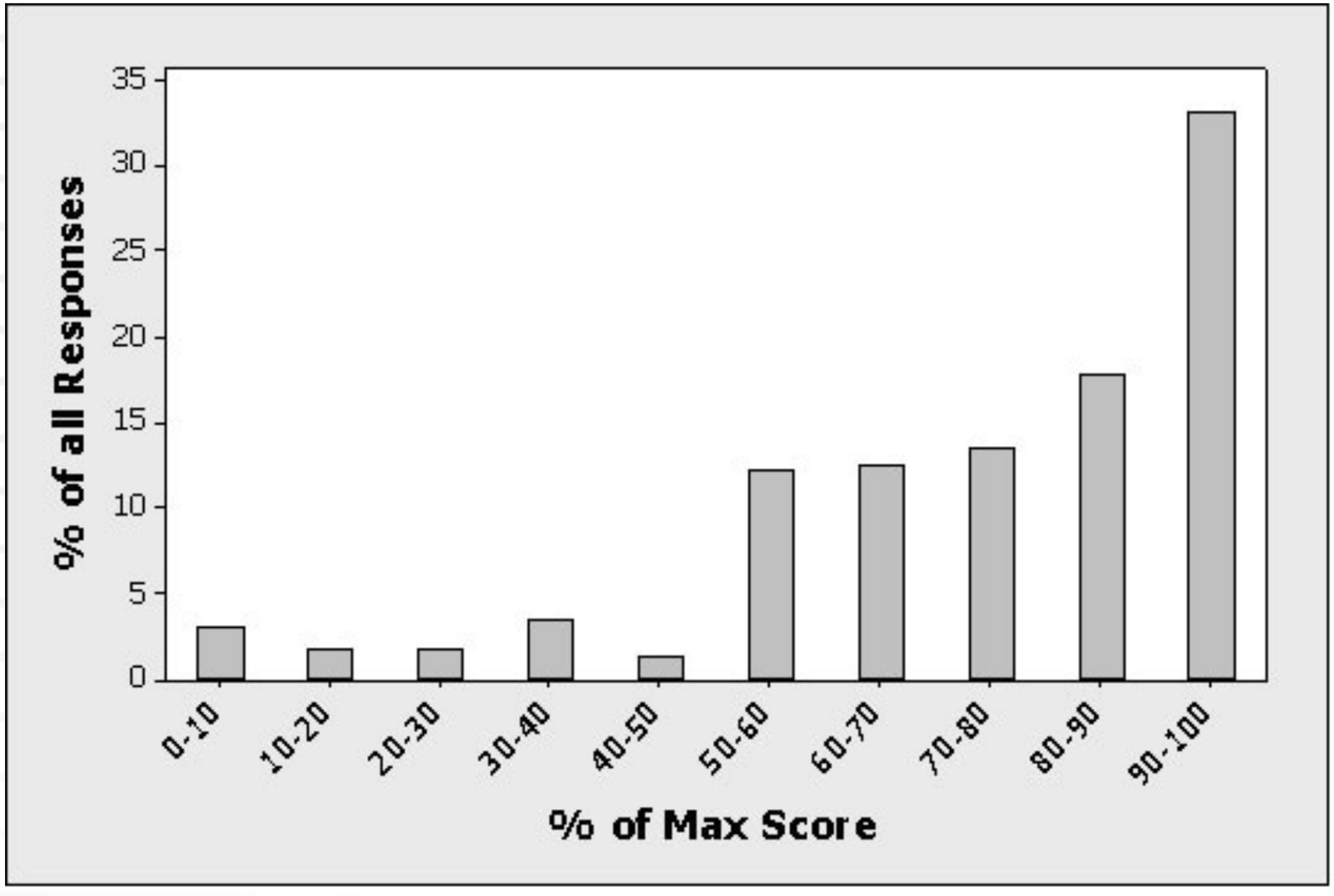
Efficiency Data – Other Measures

- The following measures have been proposed
  - Number of clicks
  - Number of pages
  - Number of errors
  - Number of times the back button is used
  - "Pogo sticking"
- There is no construct validity for any of these measures against task performance (though there may be some spurious correlations for some of these)

Satisfaction Data

- Satisfaction data can be operationalized in a number of ways, but is always opinion data
  - Standardized survey instrument (e.g. SUS, SUMI, QUIS)
  - Simple Likert item and Likert scale assessments
- Satisfaction data suffers from numerous issues that threaten their validity
  - Halo effect
  - Leniency bias
  - Strictness bias
  - Projected responding
  - Issues with introspection
  - Usability Issues–a lack of agreed understanding between the question(er)and the respondent)
- Satisfaction data does not correlate with performance

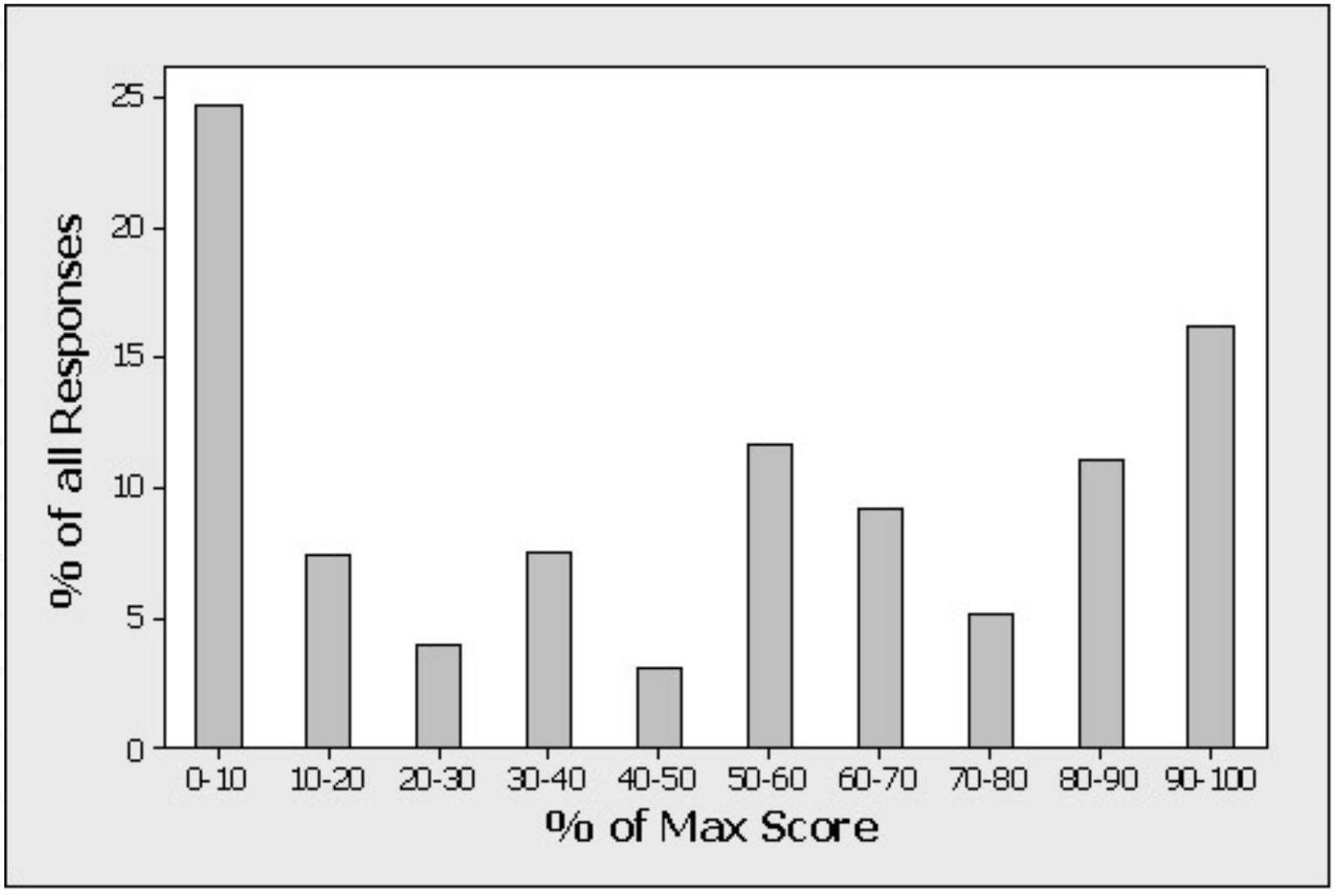
Post Test Analysis of Approx. 3000 Sessions*



Subjective Ease of Use Assessment (when successful)

*Source: Jeff Sauro, Measuring Usability

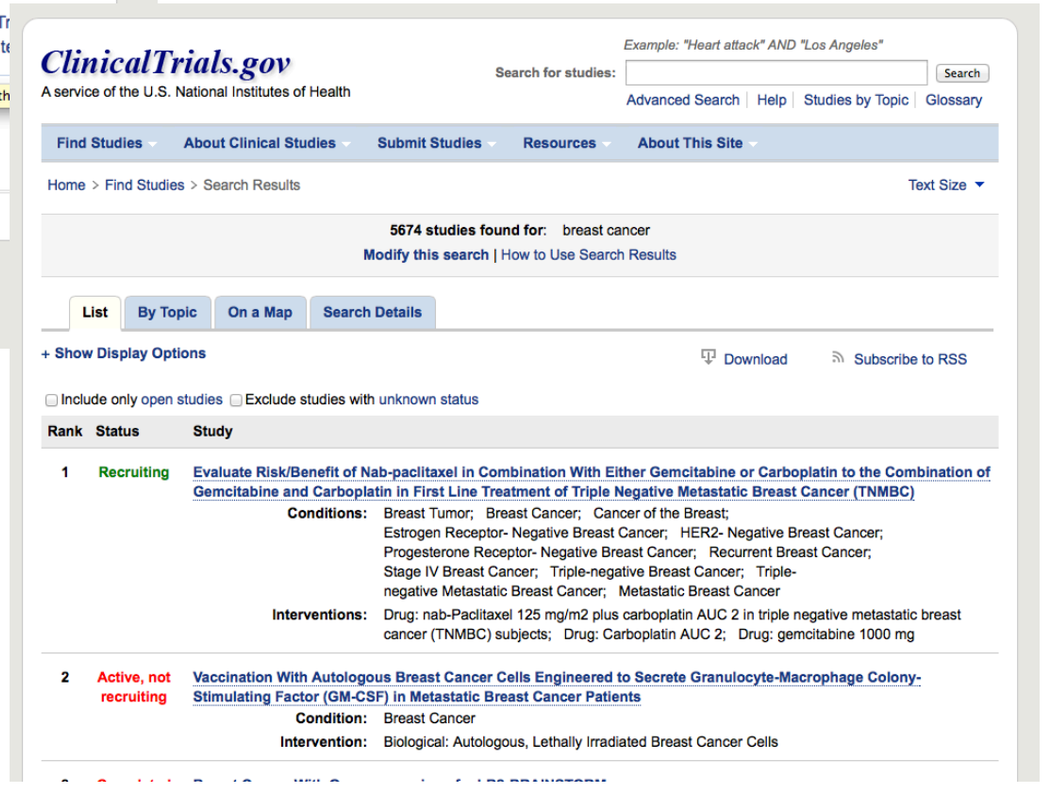
Post Test Analysis of Approx. 3000 Sessions*



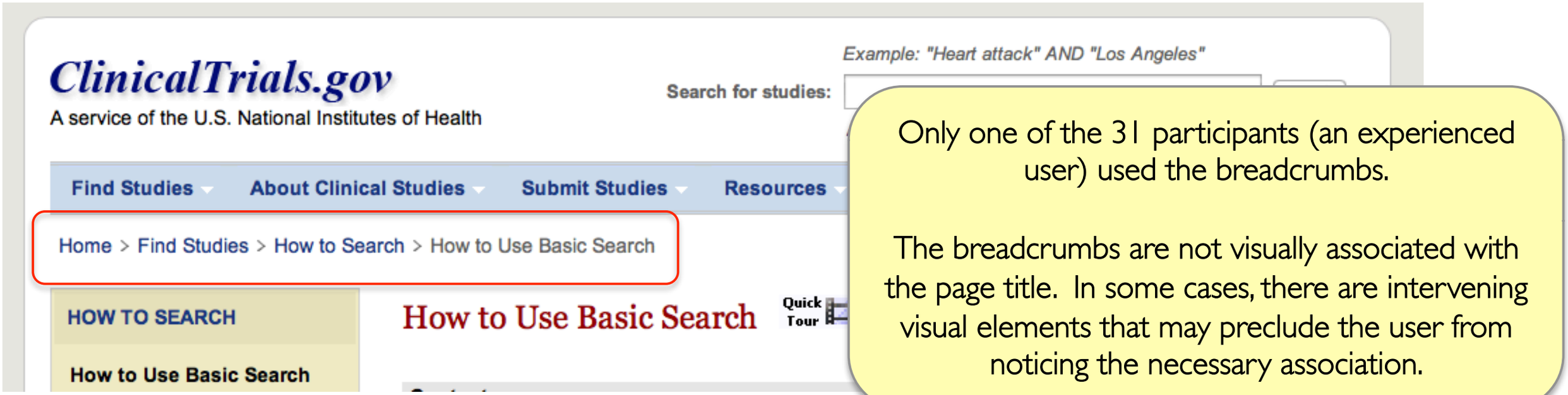
Subjective Ease of Use Assessment (when unsuccessful)

So What is Reported?

- User behaviors, with explanations of the likely cause
- Violation of industry standards and best practices
- Predictions based on prior user-based testing
- Also report, with care
  - User Comments
  - Data form standardized surveys (e.g., SUS) or other scales

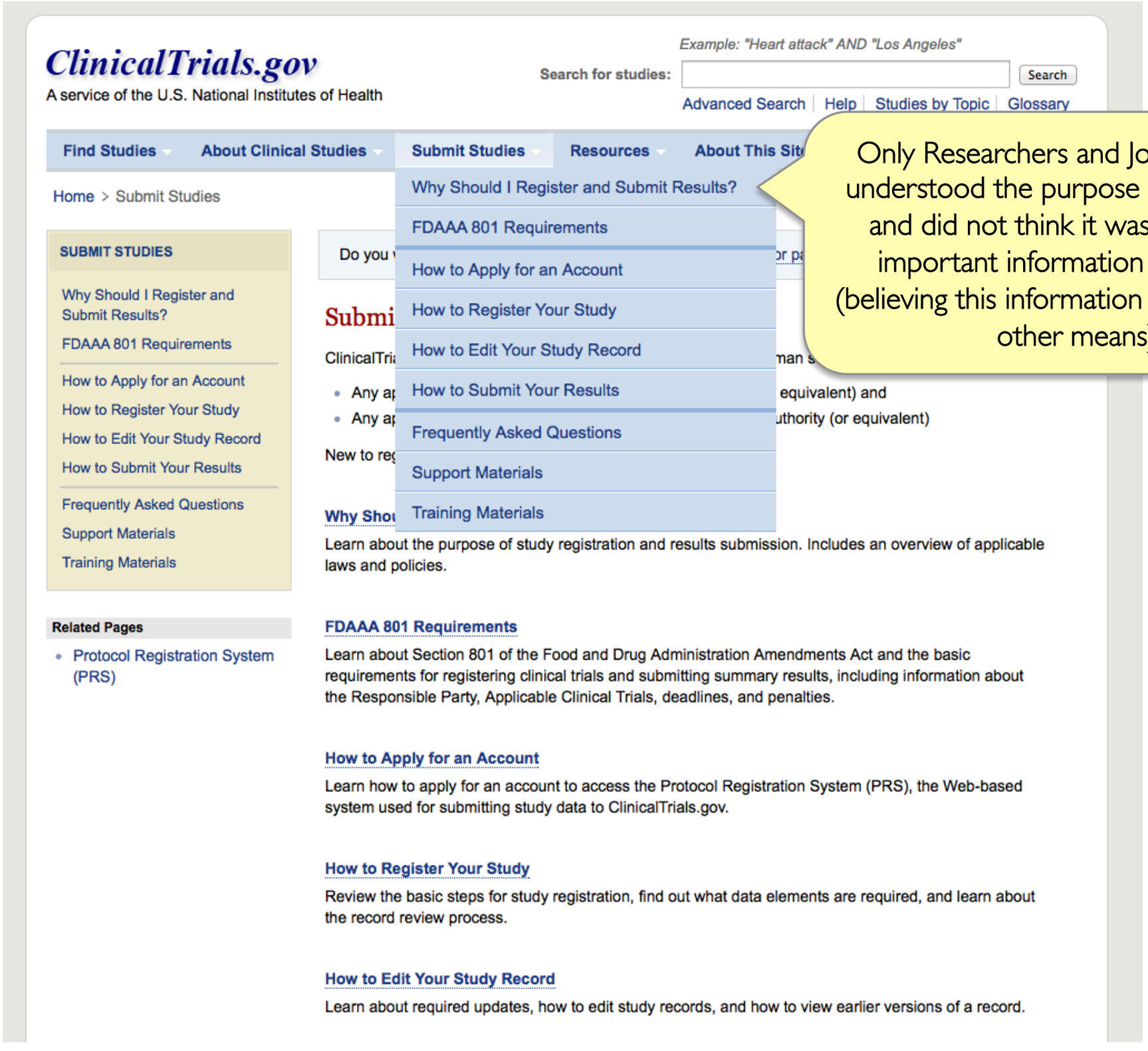


Of the 31 participants, 29 were observed using the back button for primary navigation between screens, regardless of how many intervening screens existed.



Only one of the 31 participants (an experienced user) used the breadcrumbs.

The breadcrumbs are not visually associated with the page title. In some cases, there are intervening visual elements that may preclude the user from noticing the necessary association.



Only Researchers and Journal Editors understood the purpose of this section and did not think it was particularly important information for the site (believing this information is conveyed by other means).

ClinicalTrials.gov
A service of the U.S. National Institutes of Health

Example: "Heart attack" AND "Los Angeles"

Search for studies: Search

Advanced Search | Help | Studies by Topic | Glossary

Find Studies | About Clinical Studies | Submit Studies | Resources | About This Site

Home > Find Studies > Search Results

Text Size

5674 studies found for: breast cancer

Modify this search | How to Use Search Results

None of the participants, regardless of experience, looked past the first page of results or seemed to be aware there were multiple pages of results.

List | By Topic | On a Map | Search Details

+ Show Display Options

Dow

Include only open studies Exclude studies with unknown status

Rank	Status	Study
1	Recruiting	**Evaluate Risk/Benefit of Nab-paclitaxel in Combination With Either Gemcitabine or Carboplatin to the Combination of Gemcitabine and Carboplatin in First Line Treatment of Triple Negative Metastatic Breast Cancer (TNMBC)** **Conditions:** Breast Tumor; Breast Cancer; Cancer of the Breast; Estrogen Receptor- Negative Breast Cancer; HER2- Negative Breast Cancer; Progesterone Receptor- Negative Breast Cancer; Recurrent Breast Cancer; Stage IV Breast Cancer; Triple-negative Breast Cancer; Triple-negative Metastatic Breast Cancer; Metastatic Breast Cancer **Interventions:** Drug: nab-Paclitaxel 125 mg/m2 plus carboplatin AUC 2 in triple negative metastatic breast cancer (TNMBC) subjects; Drug: Carboplatin AUC 2; Drug: gemcitabine 1000 mg
2	Active, not recruiting	**Vaccination With Autologous Breast Cancer Cells Engineered to Secrete Granulocyte-Macrophage Colony-Stimulating Factor (GM-CSF) in Metastatic Breast Cancer Patients** **Condition:** Breast Cancer **Intervention:** Biological: Autologous, Lethally Irradiated Breast Cancer Cells

The menu tabs do not provide positional feedback.

Consider more traditional tabs with a background color change or other visual indication when a tab is selected.


Home > Find Studies > Search Results
Text Size
2093 studies found for: smoking
Modify this search | How to Use Search Results
Only three participants noticed the number of results displayed on the page, which changes format (the use of bold) and terminology ("Studies" versus "Trial") on the down-level page.
Find Studies
About Clinical Studies
Resources
About This Site
Home > Find Studies > Search Results > Study Record Detail
Text Size
Trial record 1 of 2093 for: smoking
Previous Study | Return to List | Next Study ▸

ClinicalTrials.gov
A service of the U.S. National Institutes of Health

Search for studies: *Example: "Heart attack" AND "Los Angeles"*

Find Studies | About Clinical Studies | Submit Studies | Resources

Home > Find Studies > Search Results

5674 studies found for: breast cance

Modify this search | How to Use Search R

List | By Topic | On a Map | Search Details

+ Show Display Options

Download | Subscribe to RSS

☐ Include only open studies ☐ Exclude studies with unknown status

Rank	Status	Study
1	Recruiting	**Evaluate Risk/Benefit of Nab-paclitaxel in Combination With Either Gemcitabine or Carboplatin to the Combination of Gemcitabine and Carboplatin in First Line Treatment of Triple Negative Metastatic Breast Cancer (TNMBC)** **Conditions:** Breast Tumor; Breast Cancer; Cancer of the Breast; Estrogen Receptor- Negative Breast Cancer; HER2- Negative Breast Cancer; Progesterone Receptor- Negative Breast Cancer; Recurrent Breast Cancer; Stage IV Breast Cancer; Triple-negative Breast Cancer; Triple-negative Metastatic Breast Cancer; Metastatic Breast Cancer **Interventions:** Drug: nab-Paclitaxel 125 mg/m2 plus carboplatin AUC 2 in triple negative metastatic breast cancer (TNMBC) subjects; Drug: Carboplatin AUC 2; Drug: gemcitabine 1000 mg
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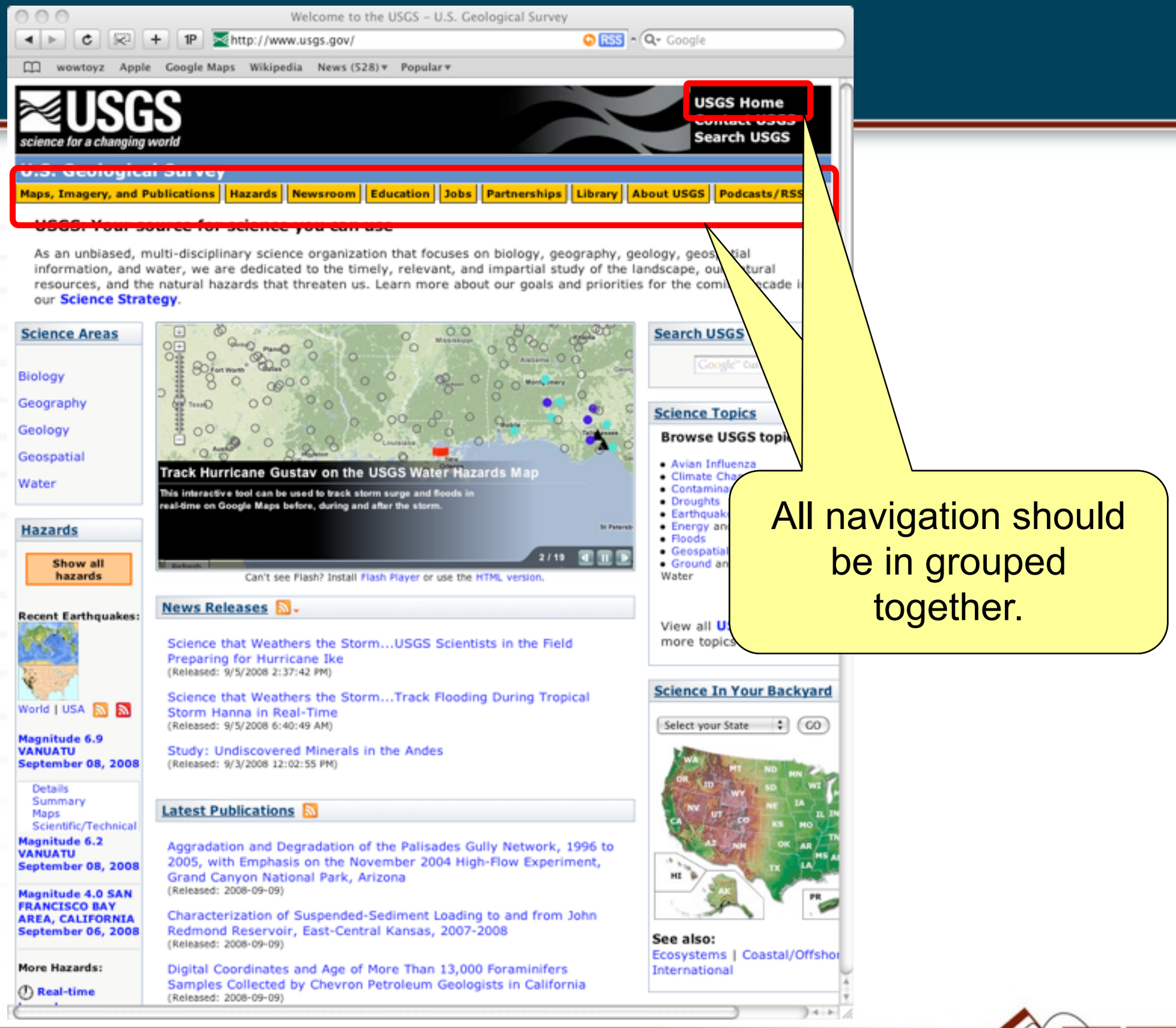
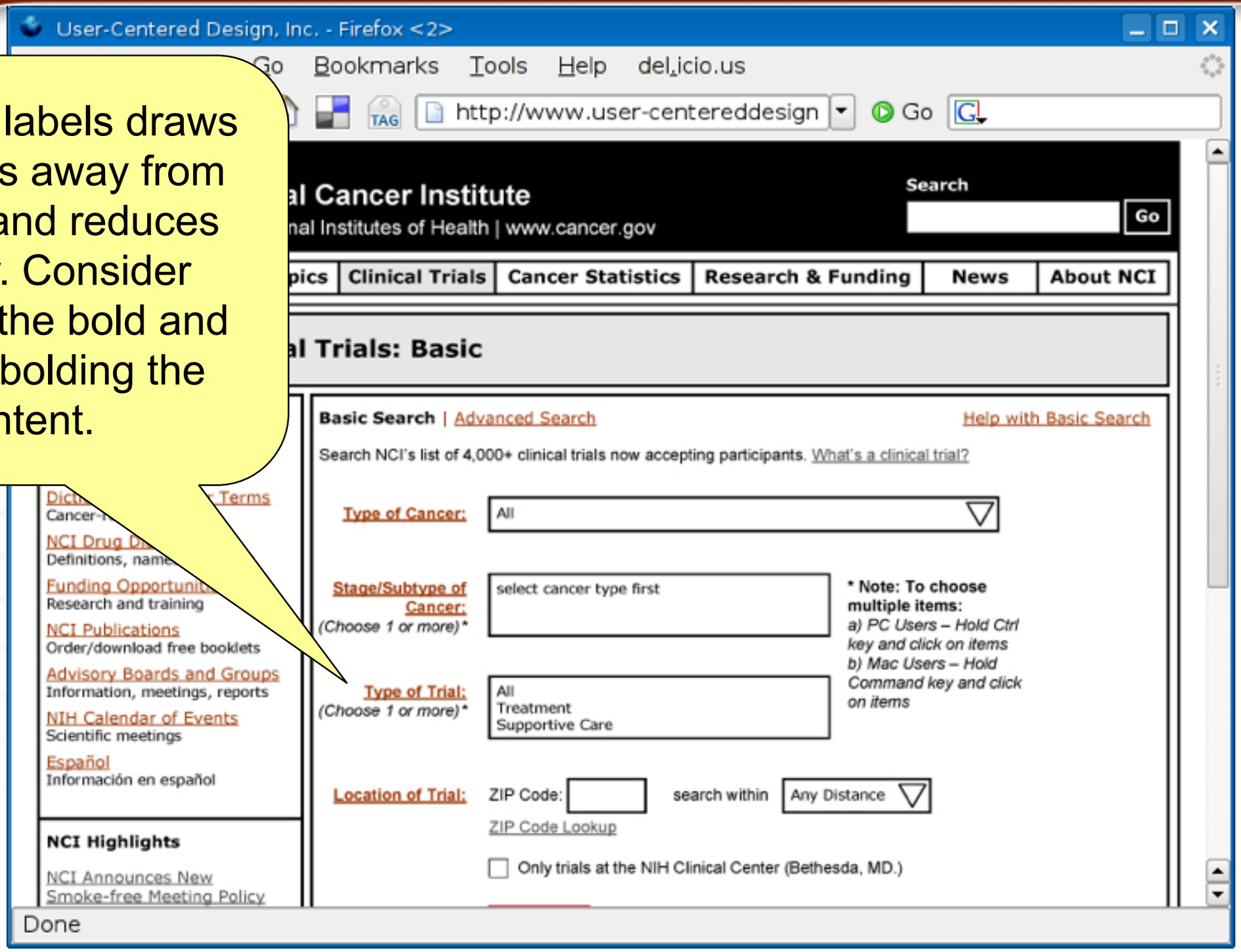
None of the participants, regardless of experience, looked past the first page of results or seemed to be aware there were multiple pages of results. When prompted, they looked around the page, scrolled, and eventually found the pagination controls at the bottom of the page.



USER-CENTERED DESIGN

Prior Research Findings

Bold form labels draws users eyes away from the form and reduces usability. Consider removing the bold and possibly bolding the content.



LOGO **National Cancer Institute**
U.S. National Institutes of Health | www.cancer.gov

Search [Go]

NCI Home | Cancer Topics | Clinical Trials | Cancer Statistics | Research & Funding | News | About NCI

Quick Links

Director's Corner
Updates from the Director

Dictionary of Cancer Terms
Cancer-related terms

NCI Drug Dictionary
Definitions, names, and links

Funding Opportunities
Research and training

NCI Publications
Order/download free booklets

Advisory Boards and Groups
Information, meetings, reports

NIH Calendar of Events
Scientific meetings

Español
Información en español

NCI Highlights

NCI Announces New Smoke-free Meeting Policy

Varenicline Helps More Smokers Quit for Longer

Nilotinib and Dasatinib: New Drugs for CML, ALL

Past Highlights

Need Help?
Contact NCI by phone, Web, and e-mail
1-800-4-CANCER

You Can Quit Smoking Now!

BreastCancerTrials.org
Matching patients to trials in the San Francisco Bay Area

Clinical Trials

> Search for Clinical Trials

Resources to help you find cancer clinical trials.

Search for Clinical Trials: Basic
Use a simple form to search NCI's list of 4,000+ clinical trials now accepting participants.

Search for Clinical Trials: Advanced
Search NCI's list of active or closed trials using additional criteria, such as type of treatment, drug name, and phase of trial.

How to Find a Cancer Treatment Trial: A 10-Step Guide
Understand what you need to know before you begin your search for a cancer treatment trial.

> Clinical Trial Results

Summaries of new cancer research findings that could affect your medical care.

Lenalidomide Effective in Multiple Myeloma [Posted: 6/28/2006]
From the 2006 meeting of the American Society of Clinical Oncology.
See more Multiple Myeloma Trial Results

Chemotherapy Superior to Radiation for Uterine Sarcoma [Posted: 6/27/2006]
From the June 12, 2006 issue of the New England Journal of Medicine.
See more Uterine Sarcoma Trial Results

Nilotinib is Safe, Effective for Ph-Positive Leukemias [Posted: 6/12/2006]
From the June 10, 2006 issue of the Journal of Clinical Oncology.
See more Leukemia Trial Results

Varenicline Helps More Smokers Quit for Longer [Posted: 6/9/2006]
From the June 2, 2006 issue of the Journal of the American Medical Association.
See Tobacco and Cancer Home Page

Browse Clinical Trial Results by Type of Cancer
Breast, Prostate, Lung, More...

See More Clinical Trial Results

Learning About Clinical Trials
Introduction to Clinical Trials
Educational Materials
More...

Conducting Clinical Trials
Data & Safety Monitoring
List a Trial in NCI's PDQ
Becoming a Co-Investigator
More...

Recent Developments
Treatment
Prevention
Testing & Screening
Patient Care Costs
More...

Feature

NCI Cancer Bulletin
Get the latest news from NCI
View Bulletin | Subscribe

Addressing the **Global Challenge of Cancer**
Learn more >

NCI 2015 Goal
Eliminating suffering and death due to cancer

NCI Home | Text-Only Version | Contact Us | Policies | Accessibility | FOIA | Site Help | Site Map
A Service of the National Cancer Institute
NCI | NIH | FirstGov

There are **50** hyper links on the home page (not including primary nav.) representing four levels within the clinical trial section and direct links to other parts of NCI

Participants (without prior exposure) failed to recognized the five primary disciplines as navigational elements. The most common expectation (if noticed at all) was that the links would provide definitions of the terms.

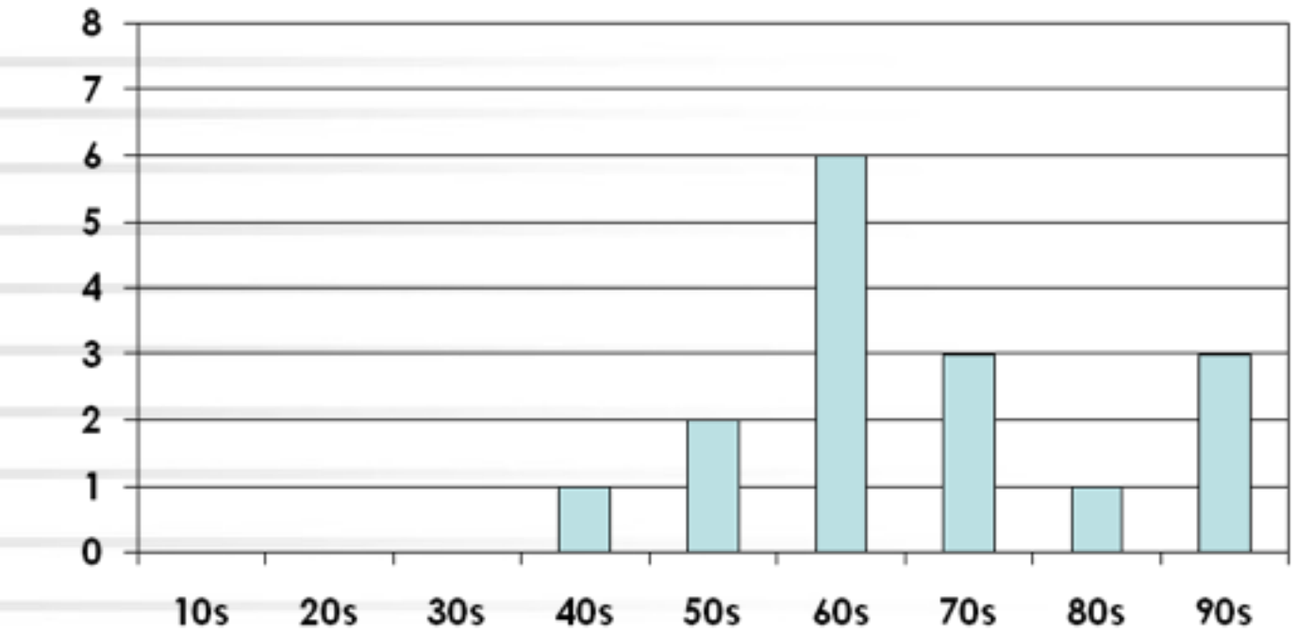
Direct Observation or Comment

Participants had difficulty understanding what content was searched.
Many thought **all content** in Clinical Trials would be searched, not just ongoing trials

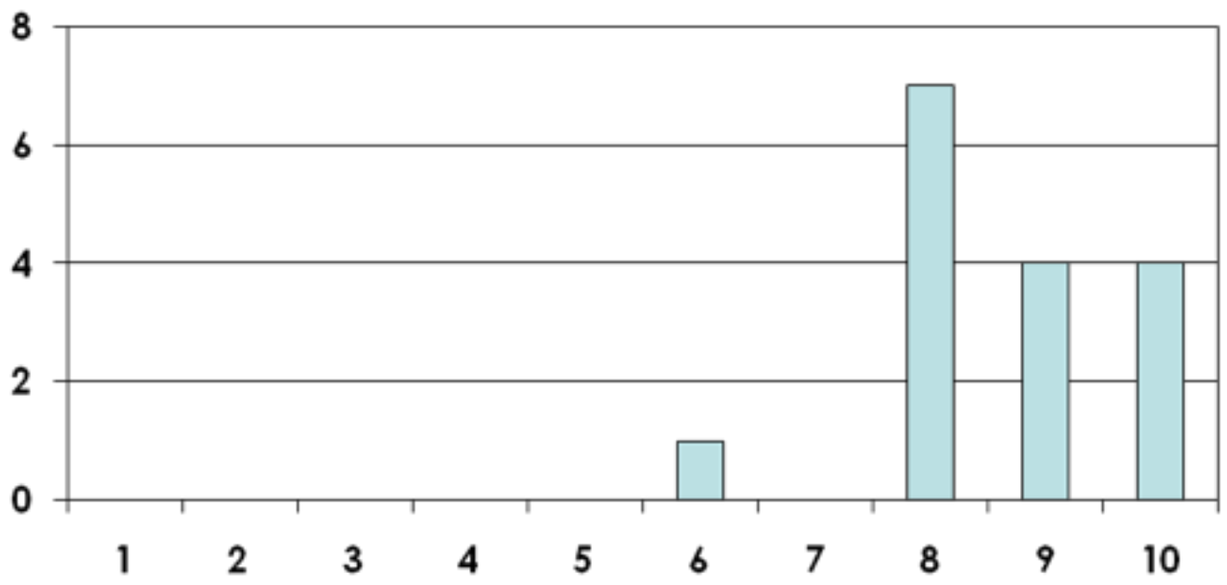
A few participants wanted to use the global NCI search to search Clinical Trials (consider labeling this "Search NCI" or "NCI Search"

Some participants responded to the term "Find" even when the search form was on the page.

Correlated User Ratings

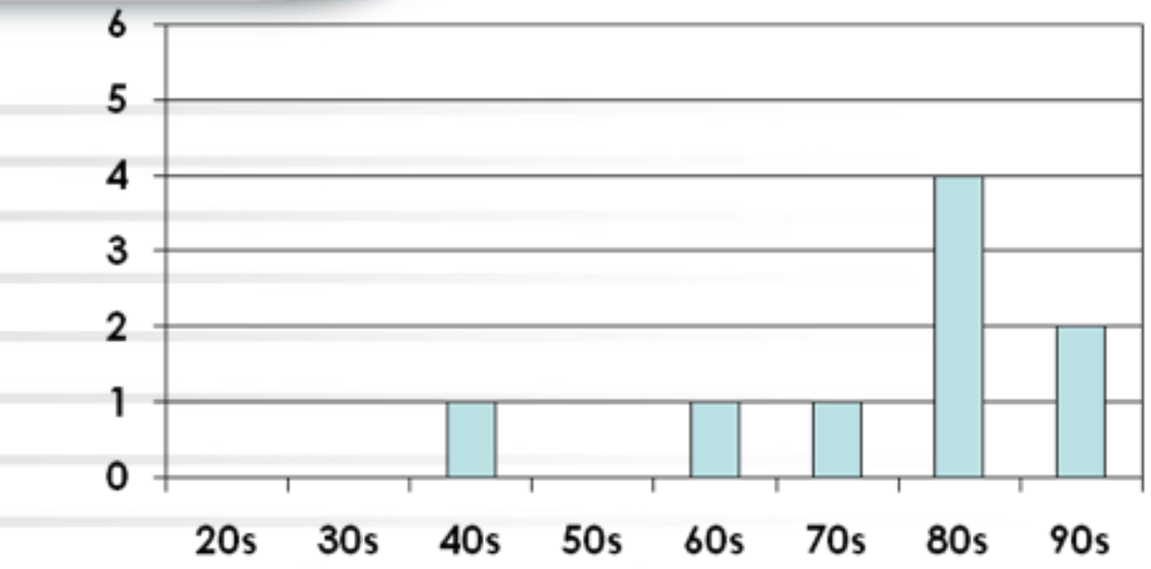


SUS

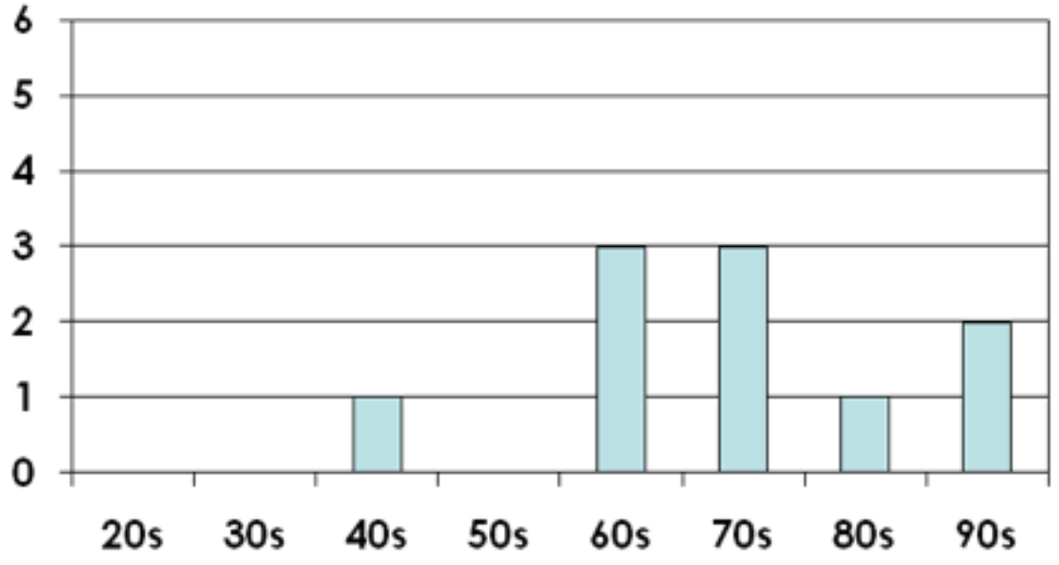


Cooper Harper

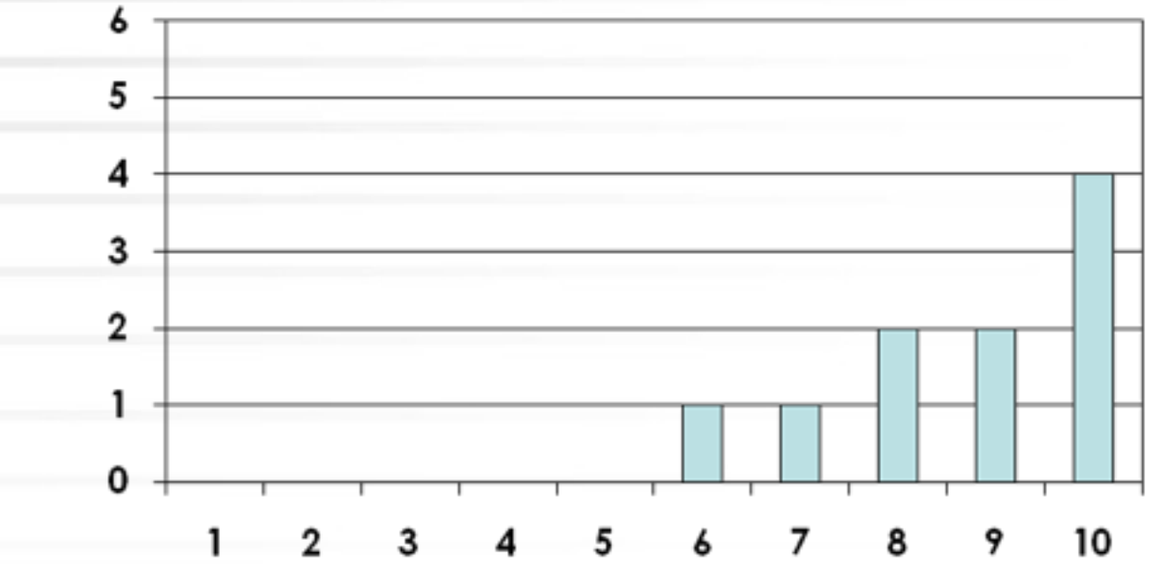
Findings from Sets of User Ratings



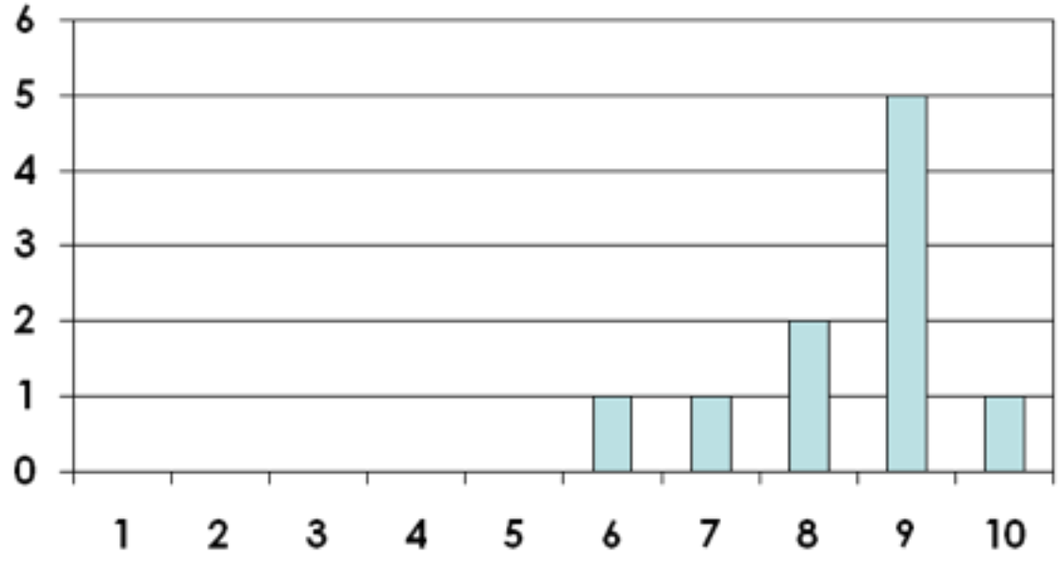
Memphis – SUS Data



DC – SUS Data



Memphis – MCH Data



DC – MCH Data

Conclusions

Conclusions

- Any testing is better than no testing, but don't mistake "6 pack and friends" testing for the real thing
- Testing with human subject is highly valuable, the basic skills can be taught, it can be deeply insightful, but it is serious business and should not be conducted casually
- The more you know about experimental design the better your testing will be, but the more you know about users the better the data you can get from any testing

Conclusions (concluded ;-))

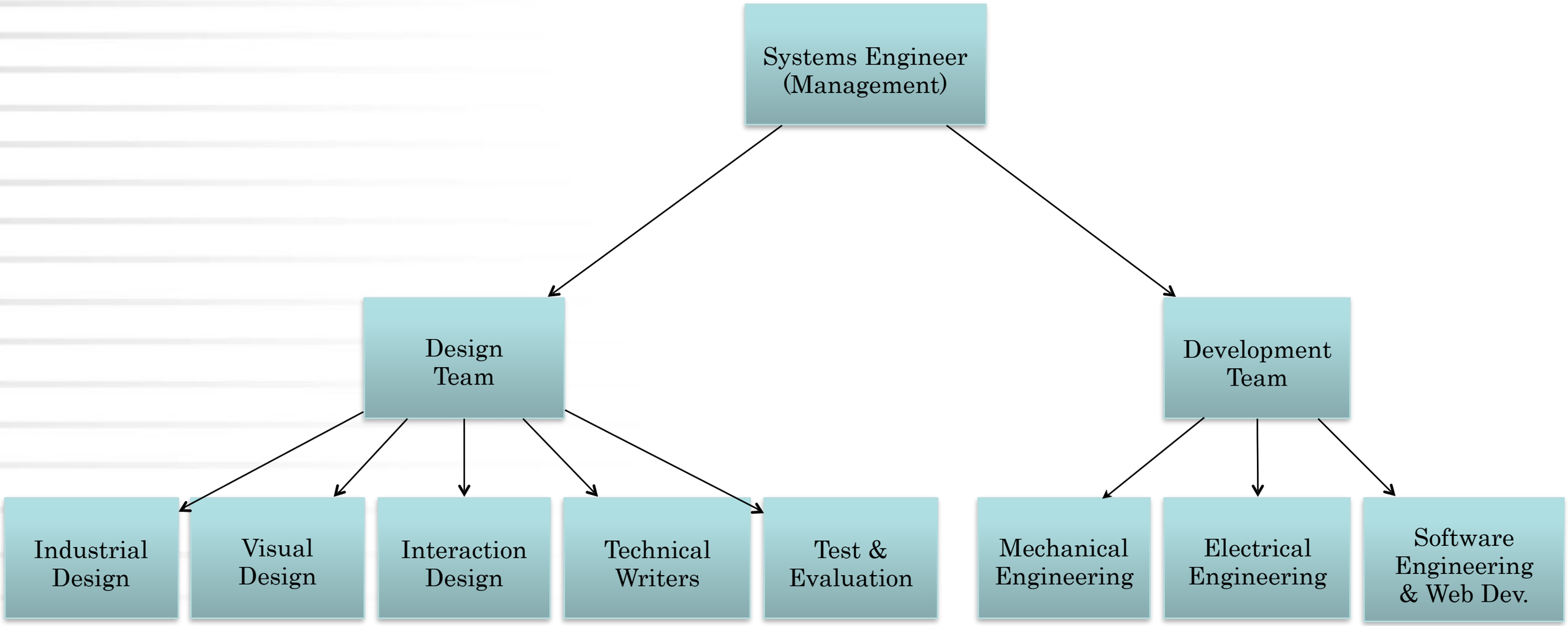
- Testing is best done early and often as part of a user-centered design process (it part of what makes is user-centered)
- The intent of testing should be to not just to know what happened, but to determine why it happened and to figure out what, if anything, can be done about it
- Unless you have the right conditions and a large sample set available, the is little distinction between a true expert review and small sample user-based testing, but experts often need users to "see" the data

Usability, Organizations, and Process

Thought From CHI '92

- The 1970s, when Hardware is King
  - 1950s – its an art
  - 1960s – there are degrees
  - 1970s – they're in management
- The 1980s, when Software is King
  - 1960s – its an art
  - 1970s – there are degrees
  - 1980s – they're in management
- 1990s, when "Interaction" should be King
  - 1970s – its an art
  - 1980s – there are degrees (?)
  - 1990s – they should be in management

Product Design & Development



Processes

- System Development Models
  - Waterfall
  - Spiral
  - V-Model
- Software Development Models
  - Dynamic System Development Process (DSDP)
  - Joint Application Development Process (JAD) (circa 1970)
  - Structured Systems Analysis and Design Methodology (SSADM) (circa 1980)
  - Information Requirement Analysis/Soft System (circa 1980)
  - Object Oriented Programming (origins in 1960, but a common methodology in the 1990s)
  - Rapid Application Development (circa 1991)*
  - Agile*
    - Extreme Programming (circa 1990)
    - SCRUM

Processes (concluded)

- Interface Design Models
  - Star (Hartson & Hix, 1989)
  - LUCID (Cognetics, 2008)
  - ISO 13407/ISO 9241
  - Human Centered Design (IDEO)
  - User-Centered Design (the common term)
- Characteristics of a User-Centered Design Process
  - Design is a separate activity, distinct from development
  - Design should occur, completely, before development begins
  - Feedback is needed at many steps in the design process to…
    - Confirm the direction of design
    - Evaluate alternatives