

# Think Aloud Protocol

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# Types of Evaluation Methods

	Think Aloud Protocol	Heuristic Evaluation	Model Human Processor	GOMS	Experiment	Competitive Analysis	Focus Groups	Questionnaire
User	X				X		X	X
Heuristic		X						
Hard-Data			X	X	X			
Market Defined						X	X	X
Speed	Fast	Medium	Slow	Slow	Slow	Fast	Fast	Slow
Cost	Cheap	Cheap	Cheap	Cheap	Expensive	Cheap	Medium	Expensive
# of users required	2-8	0	0	0	20+	0	5-6	20-3000
# of evaluators required	1-2	2-8	1-2	1-2	1-4	1-2	1	1+
Developed by	Newell & Simon from CMU	Jakob Nielsen (useit.com)	Card, Moran & Newell	Card, Moran & Newell	Social Psychology as a field	Business & Marketing as an org structure	Robert K. Merton (Sociologist)	Sir Francis Galton (Studied Anthropology)

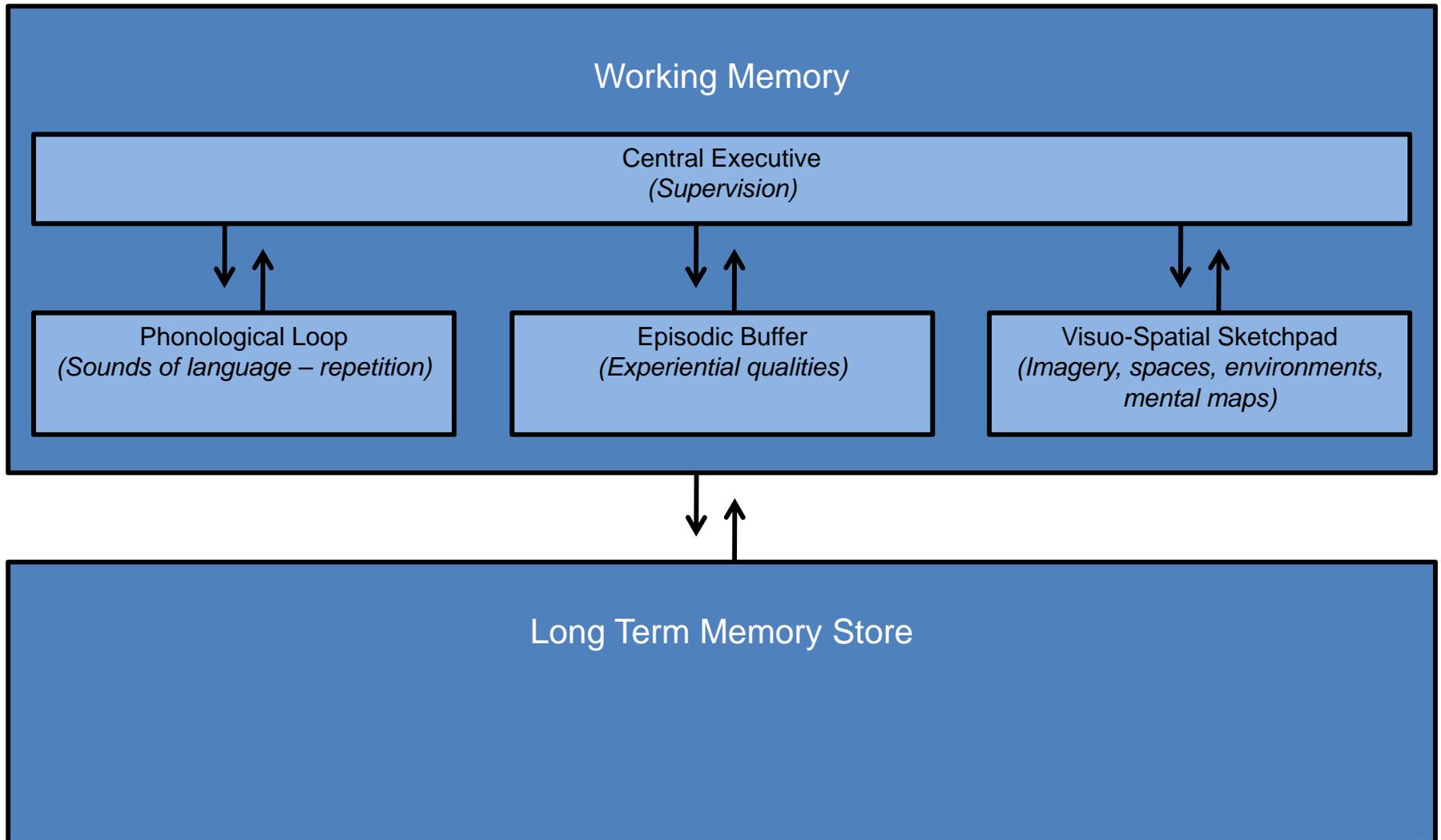
# Think Aloud

The basics:

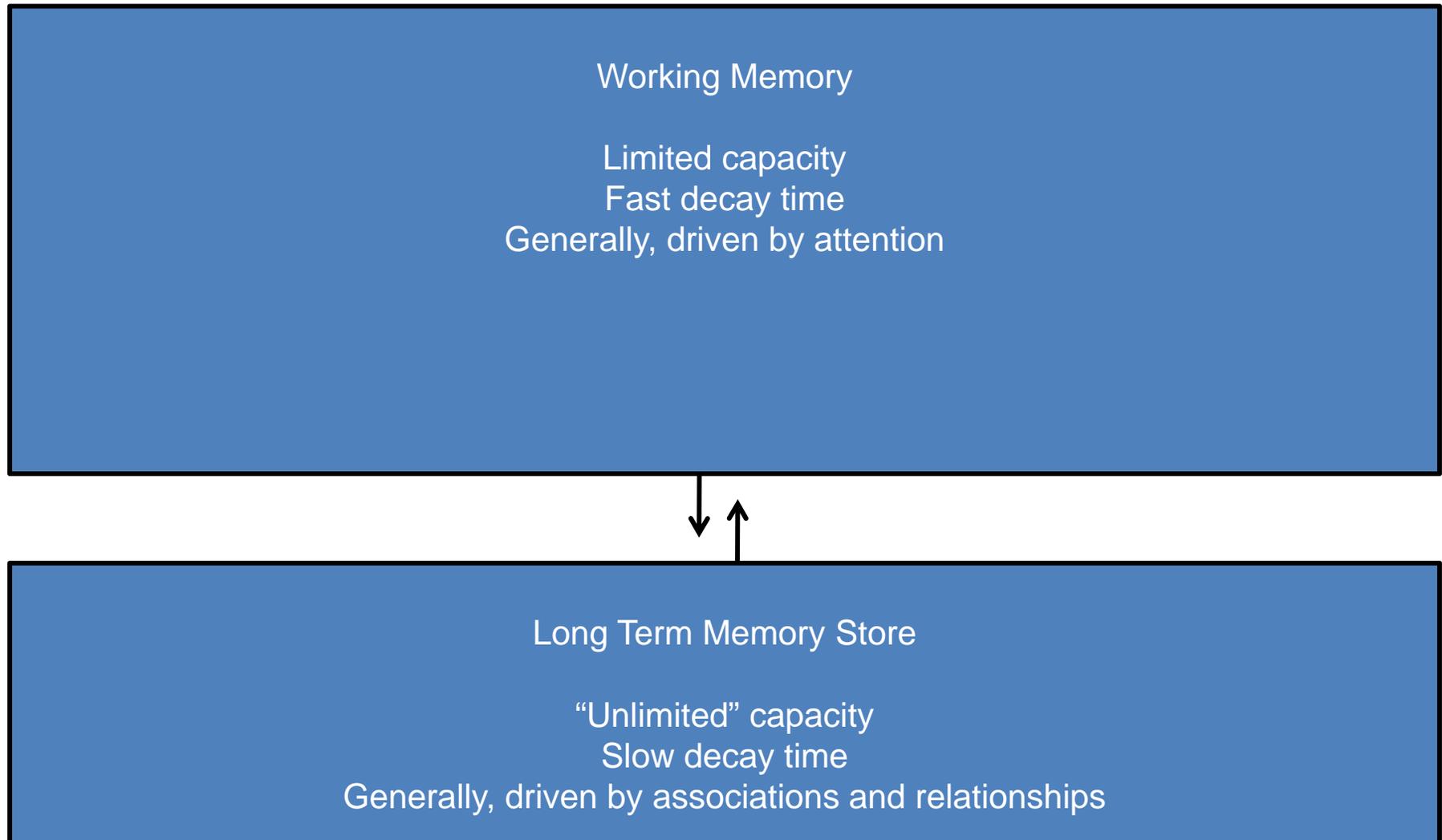
1. Take your prototype
2. Show it to real users
3. Have them use your prototype, and ..
4. .. have them think out loud while they use it.

(it really is that easy)

# Background: Understanding Memory



# Background: Understanding Memory



# Background: Allen Newell & Herb Simon

Founders of artificial intelligence, decision making, bounded rationality.

1972: Newell & Simon wanted to understand how people solve problems; needed to understand the sequence of thoughts people experience as they work through a problem.

Ultimate goal was to simulate human problem solving with Artificial Intelligence.



# Background: Why it Works

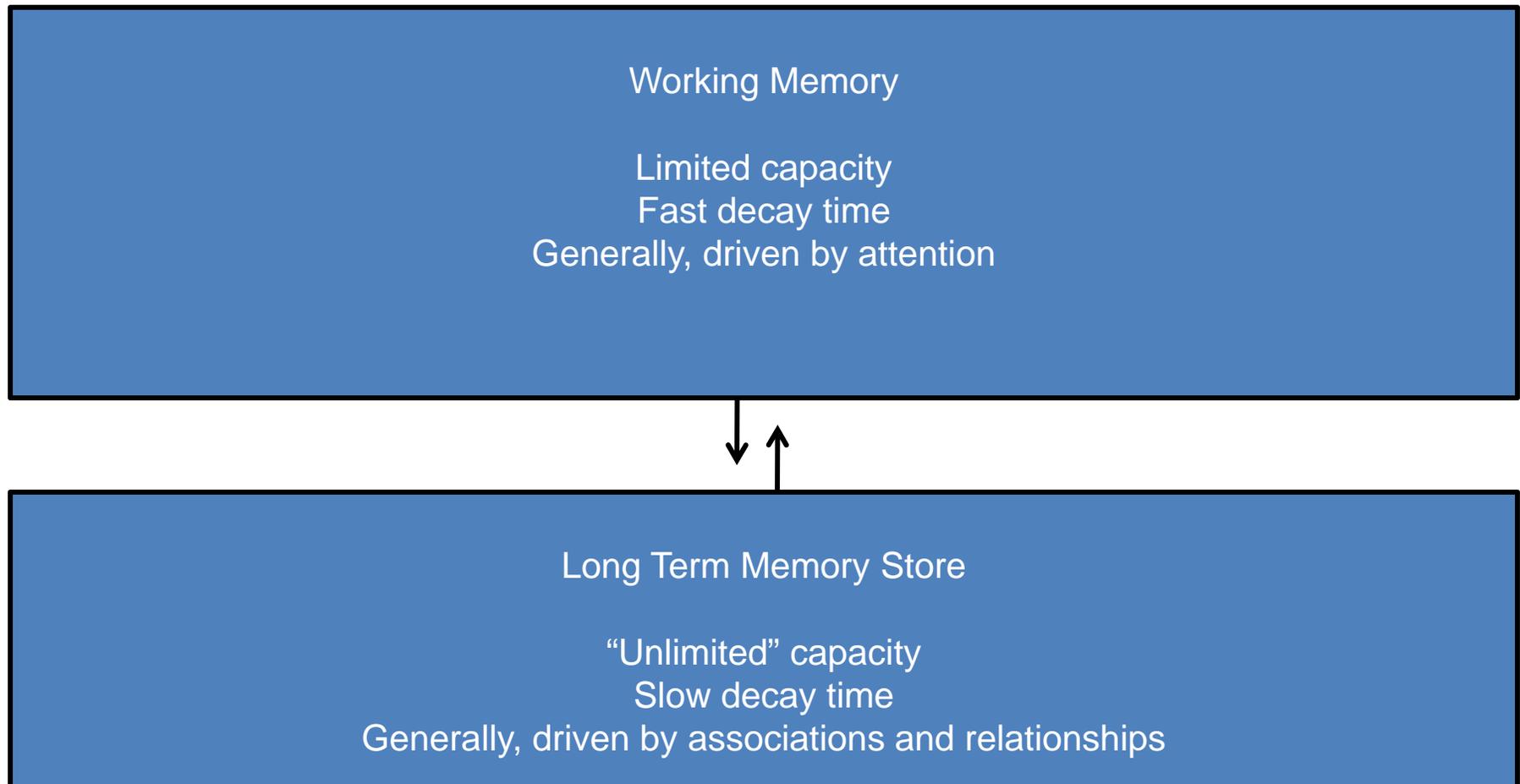
Developed experiments where one set of participants “verbalized their thoughts as they went about a task” and the other set did not.

Found that there is no affect on thought sequences, as long as there is no introspection:

People can successfully verbalize **what** they are doing without changing the outcome of a task.

# Background: Why it Works

Specifically, people can verbalize the contents of working memory.



# Background: Why it Works

When the information is not linguistic (ie, when it is visual), this will slow down the task, but will not alter the validity of the task.

If there is introspection (“why am I doing this?” or “what am I thinking about?”), the outcome changes.

This is formally called the Think Aloud Protocol (a Protocol is a standard procedure for regulating data transmission – in this case, the tasks a person is completing): a way of understanding what someone is doing, as they do it.

Or, put another way, this is a way of understanding the contents of working memory.

# Think Aloud – Preparing

Develop a prototype

- Can be of any fidelity – even paper!

Develop tasks that represent typical user goals

- Our scenarios are a great place to start
- There must be a complete path through the interface to solve these goals (don't give the user impossible tasks, it's mean)
- Print these tasks, one to a page

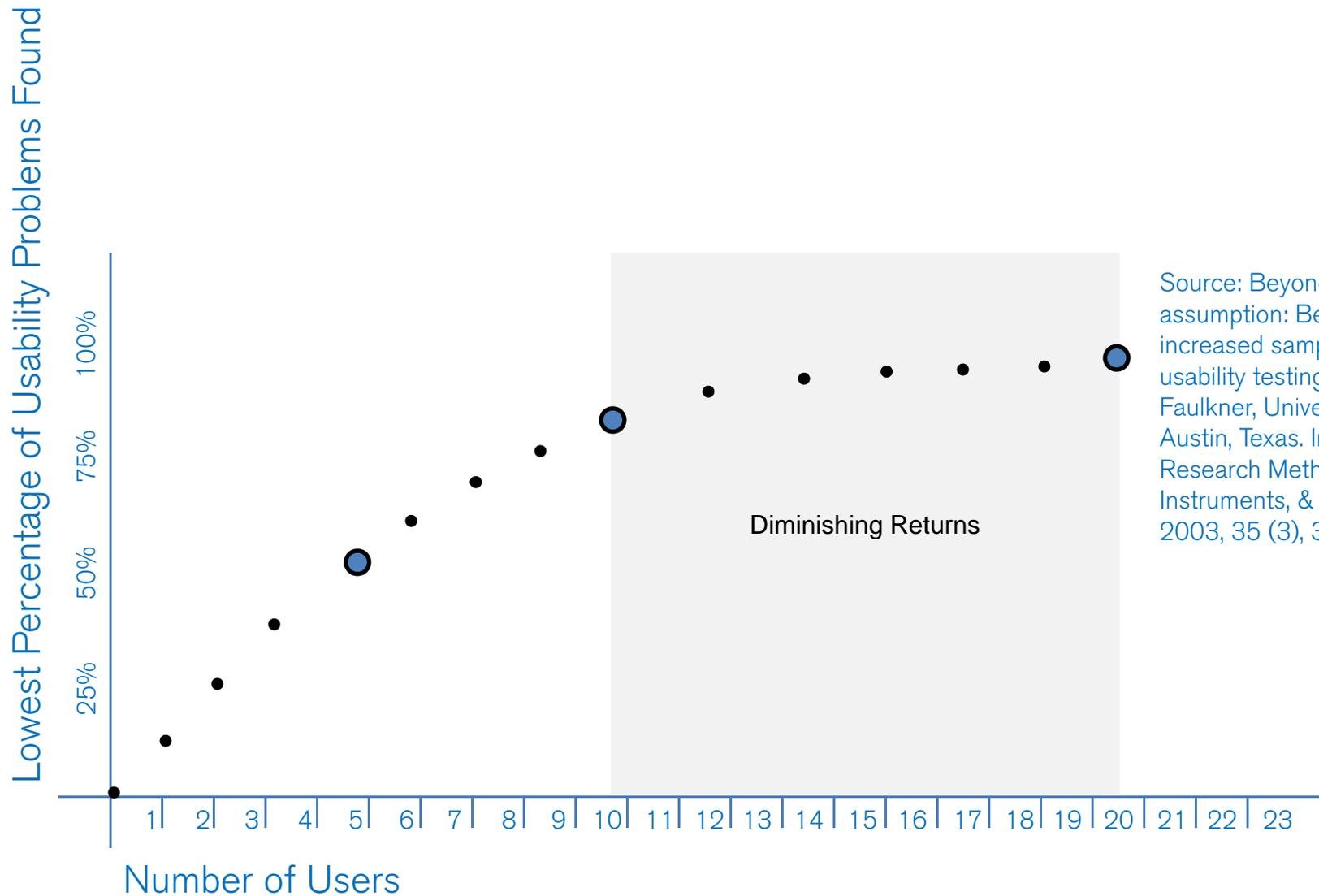
Schedule sessions with users that match the target audience

- 2-8 users, one per session

Organize yourself

- Video camera, batteries, audio camera, tapes, pens, etc.

# Think Aloud – How Many Users?

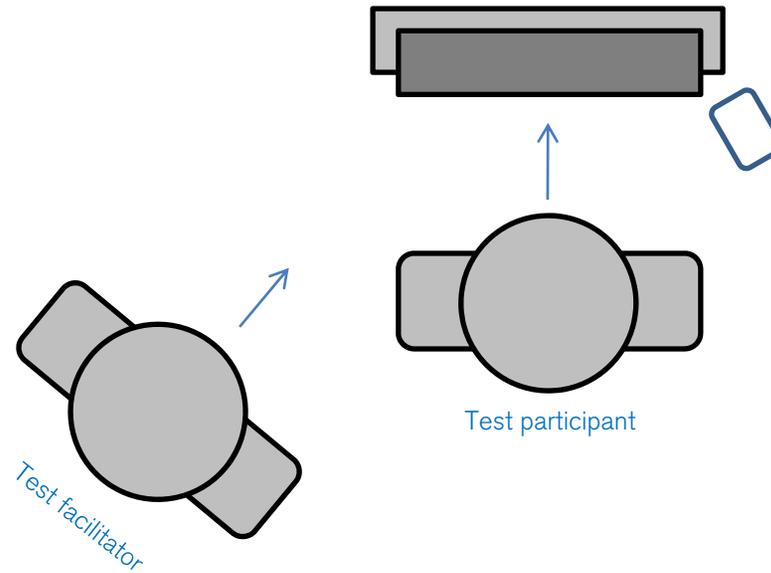


Source: Beyond the five-user assumption: Benefits of increased sample sizes in usability testing. By Laura Faulkner, University of Texas, Austin, Texas. In Behavior Research Methods, Instruments, & Computers. 2003, 35 (3), 379-383

# Think Aloud – Setting up.

## 1. Equipment and Logistics

Prepare the physical arrangement.  
Get written consent to tape.  
Don't forget to start taping!



# Think Aloud – Starting.

## 2. Introduction

Explain to the user:

- who you are & what you are doing
- that you are testing your interface, and not testing them
- that they can quit at any time
- that you won't be able to help them
- that you require them to continue talking, and you will remind them to “please keep talking” if they fall silent
- To simply verbalize what it is they are doing, as they are doing it

Verify that the user understands the tasks (have them read the tasks aloud too, and ask if there are any questions)

# Think Aloud – During.

## 3. During:

- Take good notes!
- If the user falls silent for more than three seconds, prompt them “please keep talking”
- Do not help the user complete a task (if the user asks for help, explain that you cannot help, and prompt them to try what they think is correct)
- Don’t defend your designs! This is not a critique of your design skills; don’t even mention that they are your designs.
- Be thoughtful – these are real people!

# Think Aloud – During.

## 3. During:

- While the session is running, **do not** say things like:

Please explain what you are doing

Note any design problems you see

Tell us if you have any suggestions

Why are you doing what you are doing

- By asking questions like this, we call into play Mediated Processes, such as cognitive processes, which can disrupt the information state and alter the data. Specifically – we lose track of what was in working memory, and replace it with something else.

# Think Aloud – After.

## 4. When you are all done:

Determine the critical incidents that occurred:

*By an incident is meant any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act.*

*To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects (p. 327).*

*Such incidents are defined as extreme behavior, either outstandingly effective or ineffective with respect to attaining the general aims of the activity (p. 338).*

Flanagan, (1954), Psychological Bulletin, 51 (4), 327-358.

A Critical Incident can be either Bad or Good.

# Think Aloud – After.

## 4. When you are all done:

Some (not all) criteria for identifying a Bad Critical Incident:

- The user articulates a goal and cannot succeed in attaining that goal within two minutes
- The user articulates a goal, tries several things and explicitly gives up
- The user articulated a goal and has to try three or more things before finding a solution
- The user does not succeed in the task
- The user expresses surprise
- The user expresses some negative sentiment, either about the interface or about their own skills
- The user makes a design decision

# Presenting Usability Findings

You might be presenting Usability findings...

- To propose design decisions
- To defend or rationalize design decisions
- To educate a naïve development or business team
- To evangelize to a skeptical development or business team

Generally, your audience wants to know...

- What is the problem?
- How was the problem identified – was your methodology sound?
- How are you sure that it's a problem – what evidence do you have?
- How important is it to fix the problem, relative to other problems?
- What are the technical and business implications of solving (or not solving) the problem?

# Presenting Usability Findings

1. What method was used?
  - Explain how think aloud works
  - Explain why think aloud works
  - Explain how many people you spoke with, and why such a small sample is acceptable
2. What are the top 3 problems?
  - Show a screen shot
  - Circle the problem area in a big red box
  - Include an actual quote from a user
  - Propose a recommendation fix
3. What are the remaining problems?
  - Include a chart that describes the remaining usability problems (see next page)

# Presenting Usability Findings

Unique Identifier	Unique Screen ID	Critical Incident Description	Critical Incident Evidence	Severity (1-5, 5 is high)	Frequency (1-5, 5 is common)	Proposed Solution
JK_1	1.4.A	Required fields during signup are not obvious	"I'm not sure if I need to enter these, I'm just going to skip them.. Oh, it won't let me go in. Hmm."	3	4	Indicate required fields with a red asterisk (*)
JK_2	1.4.B	Errors during form validation are not uniquely defined	"So I can't go on, but it's not telling me why – maybe I entered my birthday in the wrong format?"	3	4	Use a verbose description of changes that have to occur when alerting the user of an error

Use a unique identifier that combines the initials of your participant with a running number tally (JK = Jon Kolko, 1 = incident number one)

Use an exact quote from the user to indicate where the critical incident occurred

Define a severity and frequency rating to indicate the relative impact of the critical incident and the number of times this incident is likely to be identified by a user

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