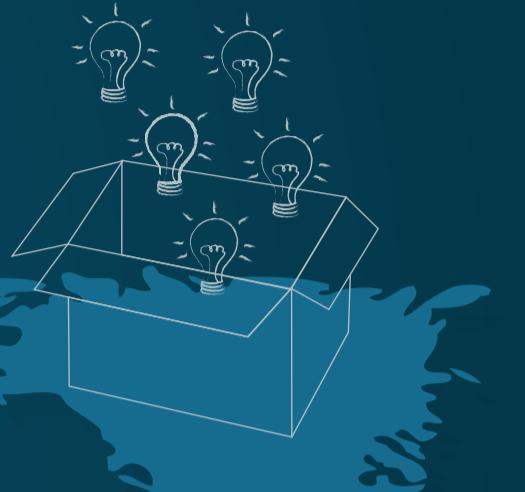


From Needs to Prototypes

Scott Klemmer



A2 Examples

Dennis Ku

User Needs

After the observations, I noted user needs that could enhance a person's experience in gaming by improving and augmenting the physical space around him and her. I sorted the user needs based on trends that I saw throughout my observations.

Phone Noise Workarounds:

1. User needs a way to pause or mute phone notifications when a game is being played on a different device to avoid constantly looking down at his or her phone
2. User needs a convenient way to reply and view phone notifications without being distracted from the game (in-game notifications)
3. User needs a convenient way to take phone calls while playing games without being distracted too much (muting the game chat and taking the call automatically)

Gaming Environment Augmentation/Detection/Changes:

4. User needs to know if the current environment is suitable to reach the full experience of the specific game
5. User needs to know if the sounds around him or her would be distracting for the game
6. User needs to know if the sounds from the game *itself* would distract from the communication between his or her teammates
7. User needs a way to automatically mute the microphone or lower its volume if excessive background noise is present
8. User needs to know if headphones or speakers are recommended to enhance the experience of the game that he or she is playing
9. User needs a way to contact remote in-game teammates quickly in case he cannot use his microphone due to technical or environmental distractions
10. User way to know if a microphone is suitable in the environment and notify all his or her teammates if he or she is not available via microphone

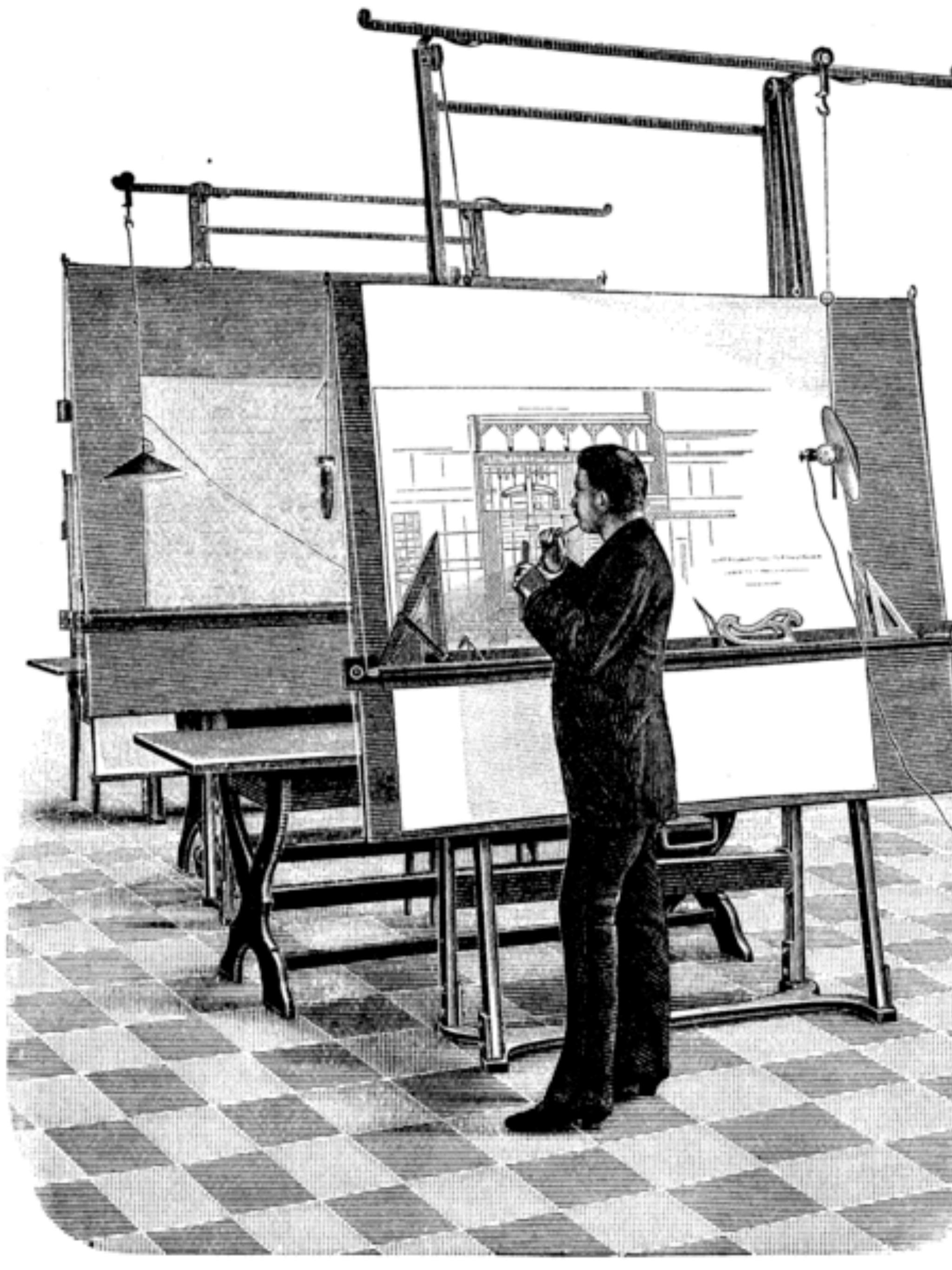
Minimizing External/Uncontrollable Distractions:

11. User needs a way to be notified in-game (or easily) if someone else has an urgent request or need so there is no need for the unplanned interaction
12. User needs a convenient way to remotely notify others that he or she is in the middle of playing a game to stay focused
13. User needs a way to be alerted that other people are in the vicinity and distractions are expected
14. User needs a schedule of the approximate when he or she would be engaged in a game, so his or her acquaintances can avoid distracting him or her
15. User needs to know if surrounding environment has any potential distractions for gaming (audio and visual)

Sarah Vargas

My interviews are based on people who go through anxiety attacks or are often very anxious. Since the full on attack is hard to observe I asked my participants to keep a diary of any attacks they had while I was not present. I was hoping this would help describe the exact

Scoping





Raise your hand
if you have made
a Web page

Raise your hand if
the source of other
pages helped.

James Lin

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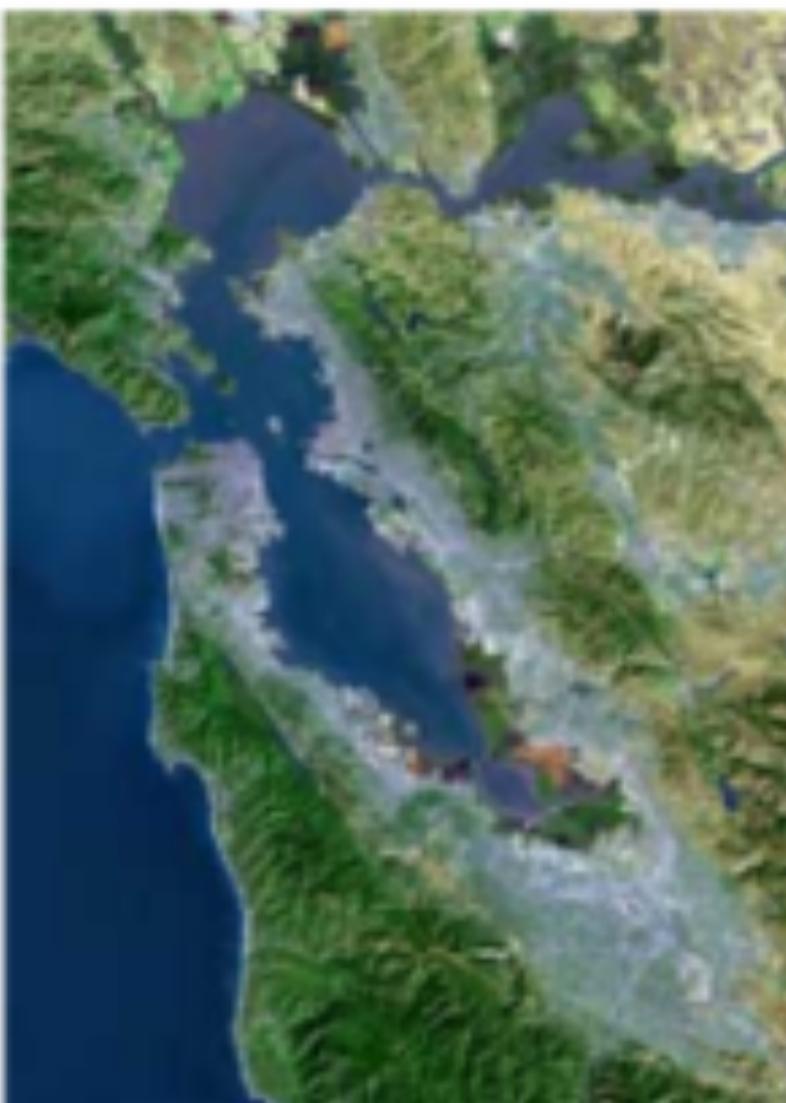
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Personal



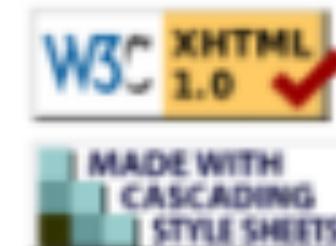
San Francisco Bay Area

Satellite photo from www.sfbayquakes.org



[UC Berkeley home page](#)
[CS home page](#)

Layout last modified on October 24, 2002



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Home

Research

Publications

Teaching



I am an Associate Professor in [Computer Science & Engineering](#) at the [University of Washington](#), specializing in human-computer interaction. My current research interests include Automated Usability Evaluation, Demonstrational Interfaces, Ubiquitous Computing, User Interface Design Tools, and Web Design.

I was previously the Laboratory Director of [Intel Research Seattle](#), a university affiliated research lab that is exploring the new usage models, applications, and technology for ubiquitous computing.

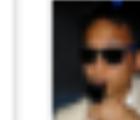
I am a founding member of the University of Washington [Design:Use:Build \(DUB\) Center](#), a cross-campus interdisciplinary group of HCI and Design researchers.

I received my B.S. in EECS from [UC Berkeley](#) in 1990 and my M.S. and Ph.D. in CS from [Carnegie Mellon University](#) in 1993 and 1996, respectively. My Ph.D. dissertation was the first to demonstrate the use of sketching in user interface design tools. I was also the chief scientist and co-founder of [NetRaker](#), which was acquired by KeyNote Systems in 2004.

[My DUB Blog](#)

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Layout last modified on January 12, 2009



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RESEARCH

I am interested in techniques to improve the design of computer systems with respect to their usefulness and usability. To that end, I have investigated the effectiveness and usability of several HCI techniques (e.g., think-aloud usability studies, Cognitive Walkthrough, GOMS) and produced new techniques for bringing usability concerns to the design process (e.g., CPM-GOMS and software architecture evaluation for usability). Much of my work focuses on cognitive modeling, where I work within a unified theory of cognition to develop models of human performance that produce quantitative predictions of performance with less effort than prototyping and user testing. I also work on bridging the gap between HCI and software engineering, specifically including usability concerns in software architecture design.

Two active research projects have their own websites.

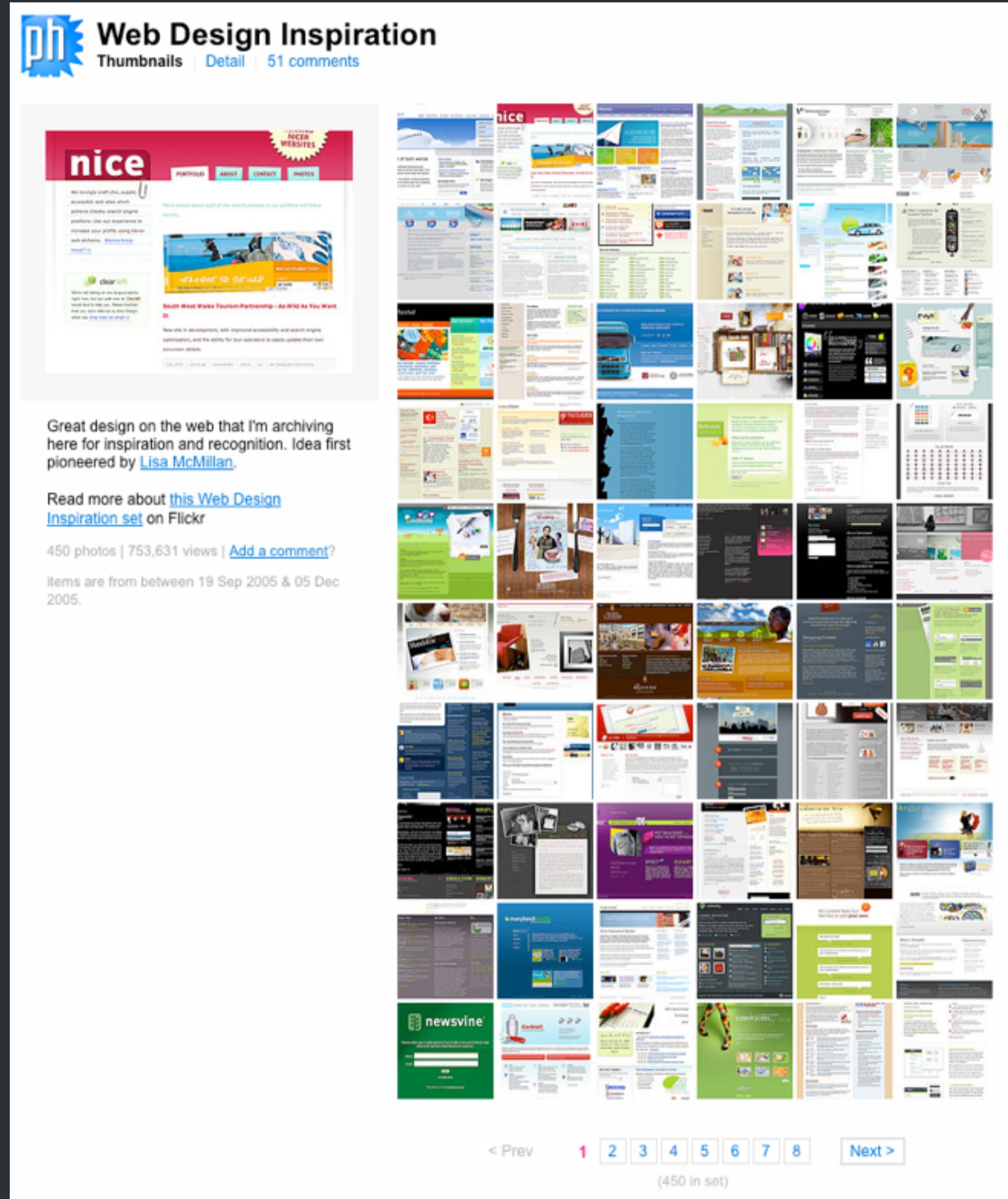
[Usability and Software Architecture \(U&SA\)](#)

[The CogTool Project: a Tool for Cognitive Modeling](#)

TEACHING

I teach courses in HCI design and evaluation methods. I was the Director of the [Master of Human-Computer Interaction Program](#) for almost a dozen years, stepping down in January 2009.

[FULL CURRICULUM VITA \(.pdf\)](#)



Examples provide context, implementation, and composition



A screenshot of a Flex development environment. At the top, there is a banner for "FACE AIDS" with the tagline "When it comes to HIV, everyone is a victim." Below the banner, there are two sections: "REAL FACES. REAL FEARS. REAL HOPE." on the left and a large image of a young child on the right. To the right of the child is the "FACE AIDS" logo and the text "A student campaign to fight AIDS in Africa". Below these sections is another banner with the text "THINK GLOBALLY, ACT LOCAL" and "FACE AIDS TODAY". At the bottom, there is a toolbar with various icons, a tab labeled "AIRTest.mxml", and a code editor window showing the XML code for the application.

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <mx:WindowedApplication xmlns:mx="http://www.adob
3     <mx:Script>
4         <![CDATA[
```

**“There are no rules of
composition in
photography, there are
only good photographs”**

-Ansel Adams

ANSEL ADAMS

The Camera



THE ANSEL ADAMS PHOTOGRAPHY SERIES 1

ANSEL ADAMS

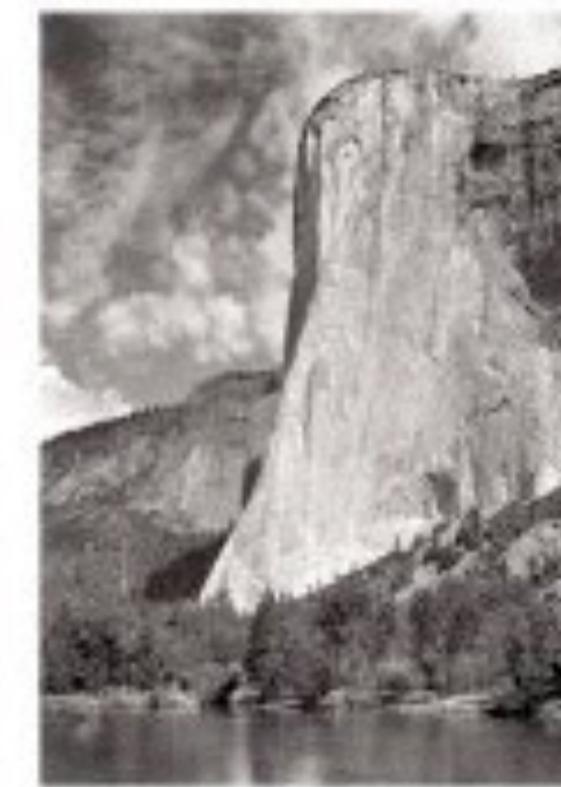
The Negative



THE ANSEL ADAMS PHOTOGRAPHY SERIES 2

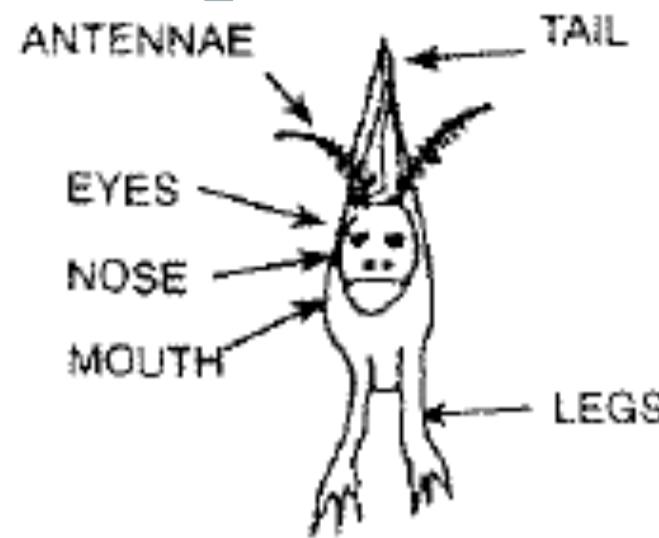
ANSEL ADAMS

The Print

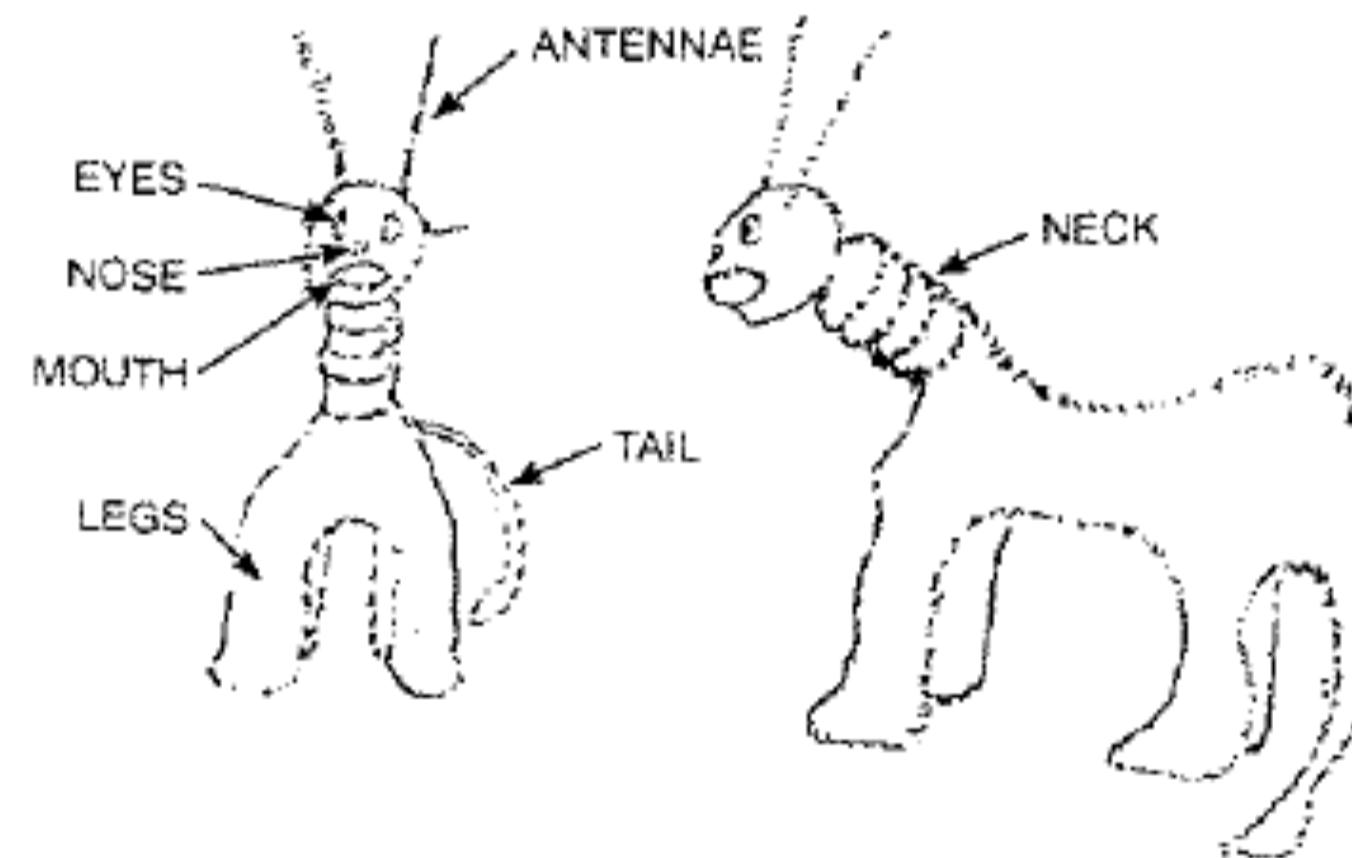


THE ANSEL ADAMS PHOTOGRAPHY SERIES 3

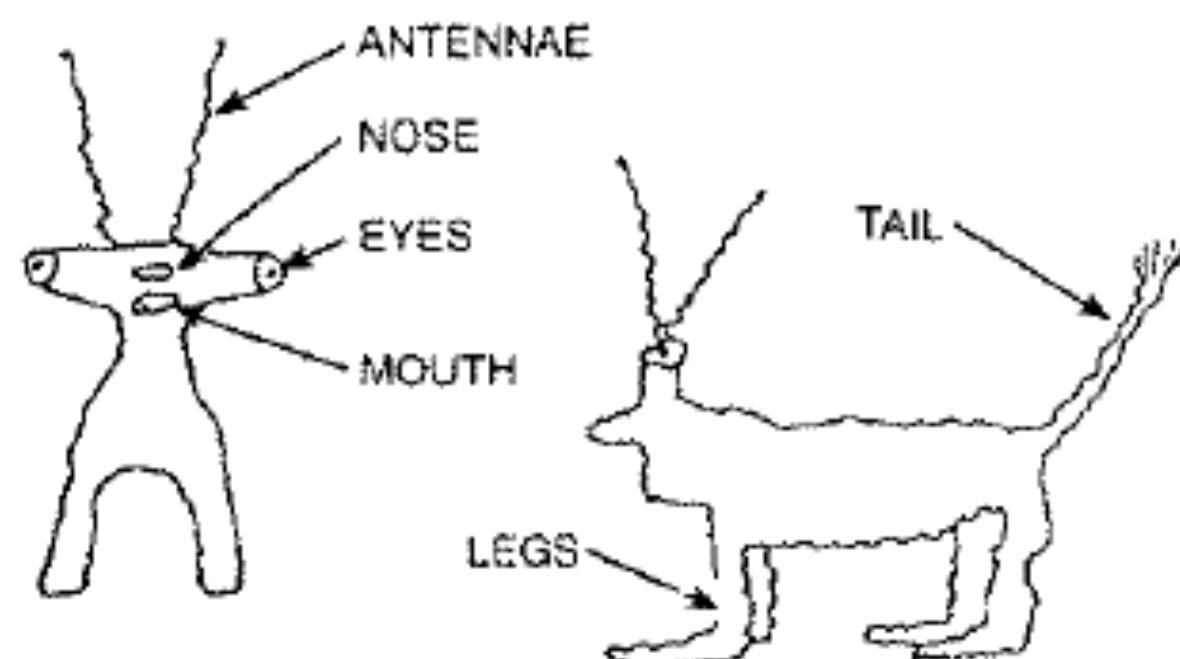
Examples can increase



This creature can walk
on land and swim in water
very well.



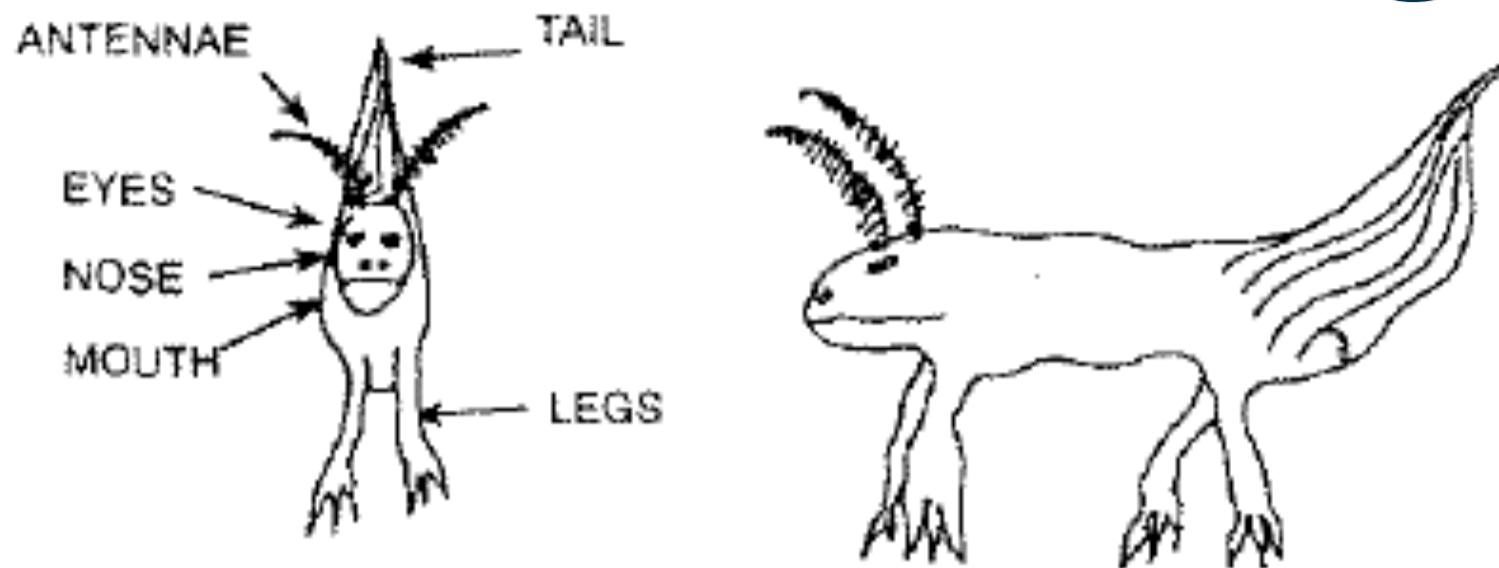
A very funny creature, it
is so soft that it makes no
noise when it walks.



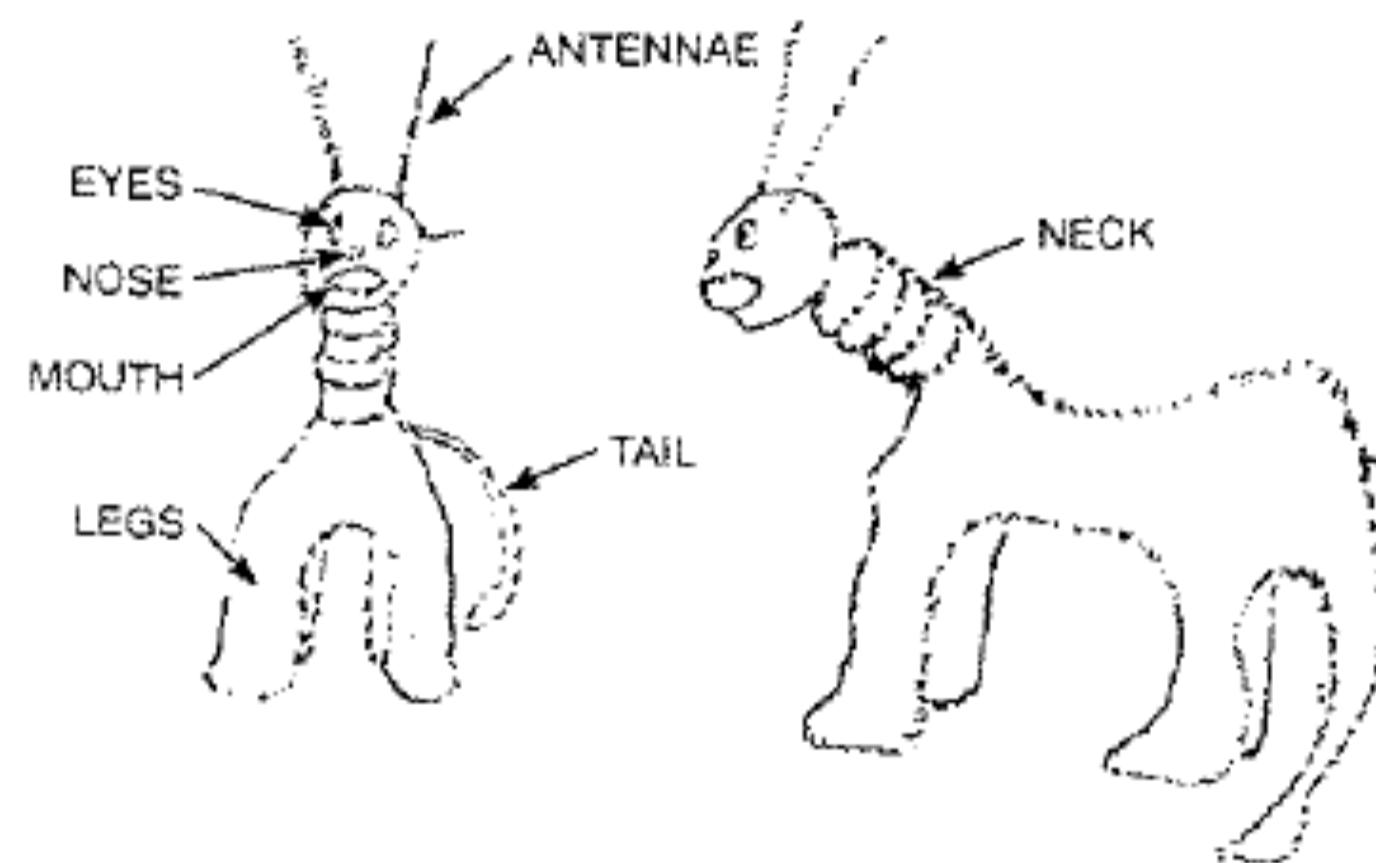
This is a blue-green
creature that is very
wrinkled but gentle.

Will nothing new
ever be created?

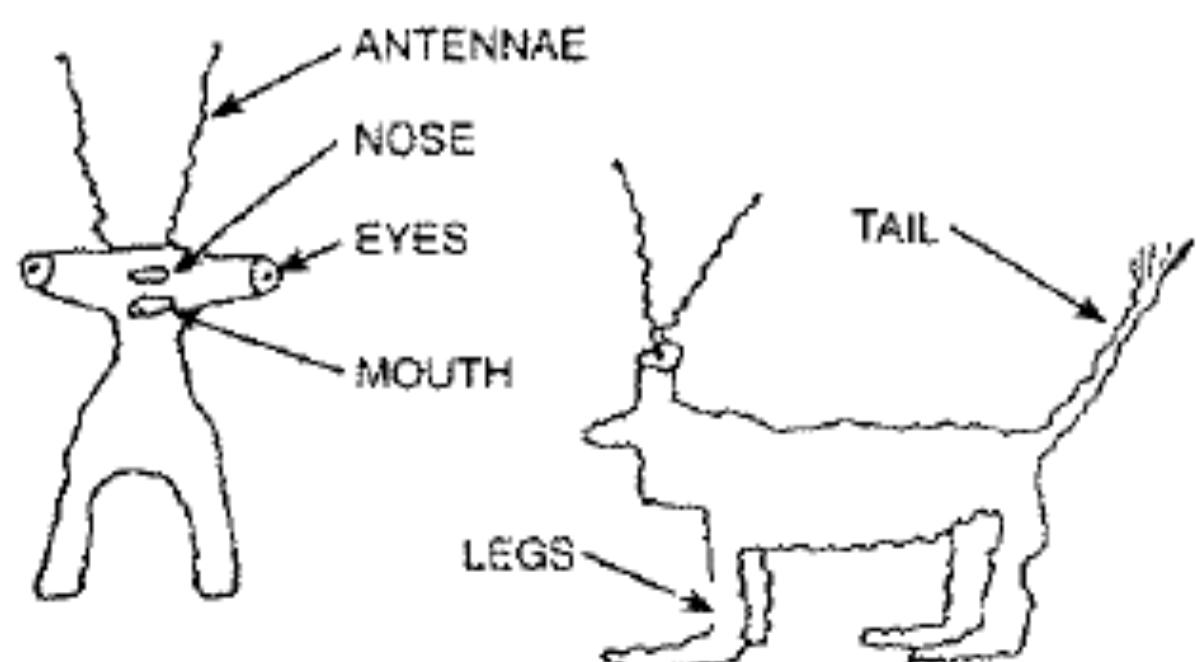
...without reducing novelty



This creature can walk on land and swim in water very well.



A very funny creature, it is so soft that it makes no noise when it walks.



This is a blue-green creature that is very wrinkled but gentle.

Marsh et al. 1996

Just for Small Innovations?

“By ... metaphors and analogies we try to link the new to the old, the novel to the familiar. Under sufficiently slow and in the case of a sharp discontinuity, however, the method breaks down ... our past experience is no longer relevant, the analogies become too shallow, and the metaphors become

—E.W. Dijkstra, *On the Cruelty of Really Teaching Computer Science*



Les Demoiselles d'Avignon

John Richardson, *A Life of Picasso: The Cubist Rebel, 1907-1916*



1043.

Palais Longchamp

**“Good artists borrow, great artists
steal”**



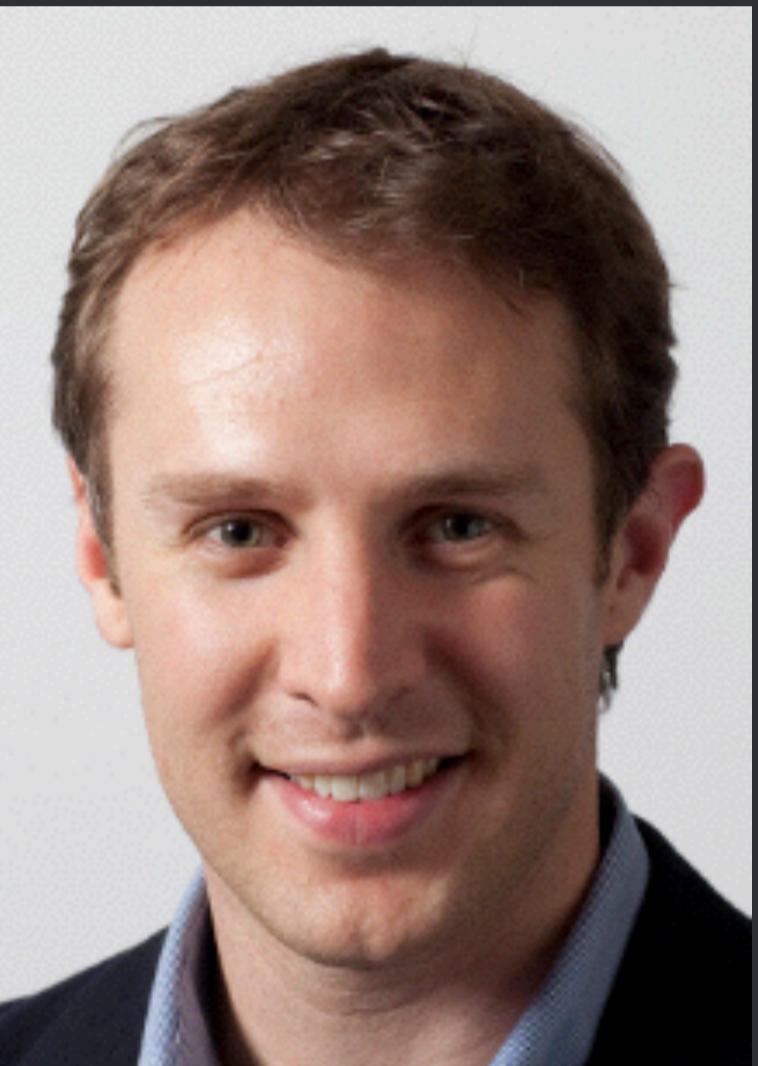
Les Demoiselles d'Avignon



19th century Fang sculpture

(How) can we
measure creative
results?

Design Process at Large



Steven Dow *et al.*

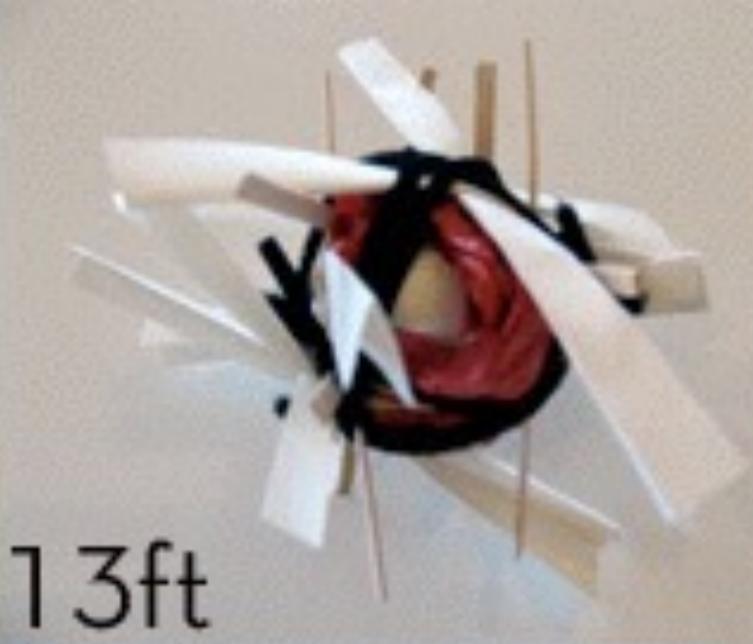
Early and Repeated Exposure to Examples Improves Creative Work, Chinmay Kulkarni, Steven P Dow, Scott R Klemmer. *Cognitive Science*, 2012.

Prototyping Dynamics: Sharing Multiple Designs Improves Exploration, Group Rapport, and Results, Steven P Dow, Julie Fortuna, Dan Schwartz, Beth Altringer, Daniel L Schwartz, and Scott R Klemmer. *CHI: ACM Conference on Human Factors in Computing Systems*, 2011.

Parallel Prototyping Leads to Better Design Results, More Divergence, and Increased Self-Efficacy, Steven P Dow, Alana Glassco, Jonathan Kass, Melissa Schwarz, Daniel Schwartz, Scott R Klemmer. *ACM Transactions on Computer-Human Interaction*, 2010



15ft



13ft



7ft



7ft



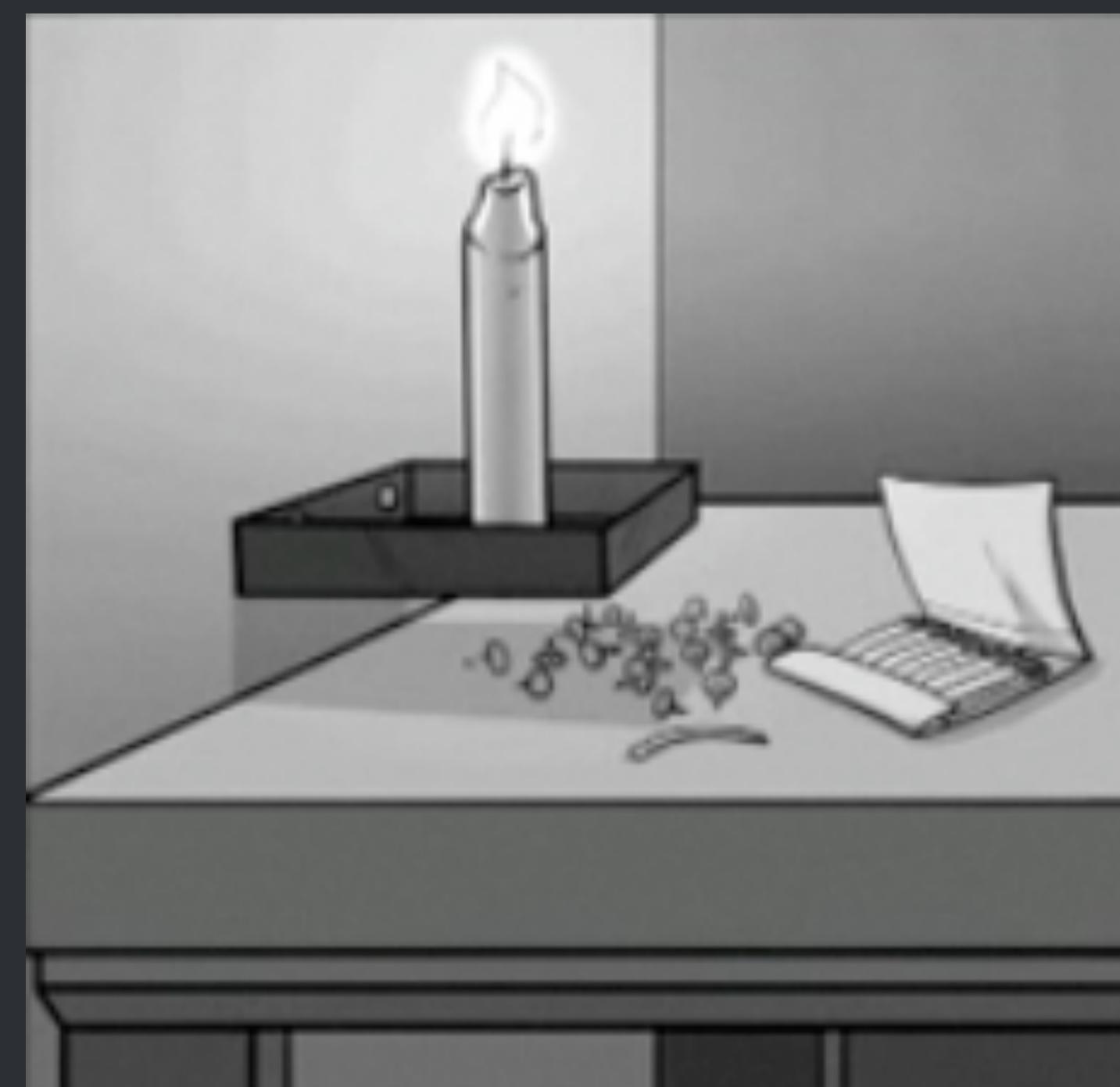
7ft

Participants picked their concept



"I prefer to have a platform that's stable, that's not too high, so that it's not hard to get in and out of. I'd like to have a platform and then as good of cushion as possible... I don't see any other

Functional Fixation



Duncker, 1945

DESIGN AT LARGE

Can process
offer a fixation
antidote?

Prototyp

Feedback

Prototyp

Feedback

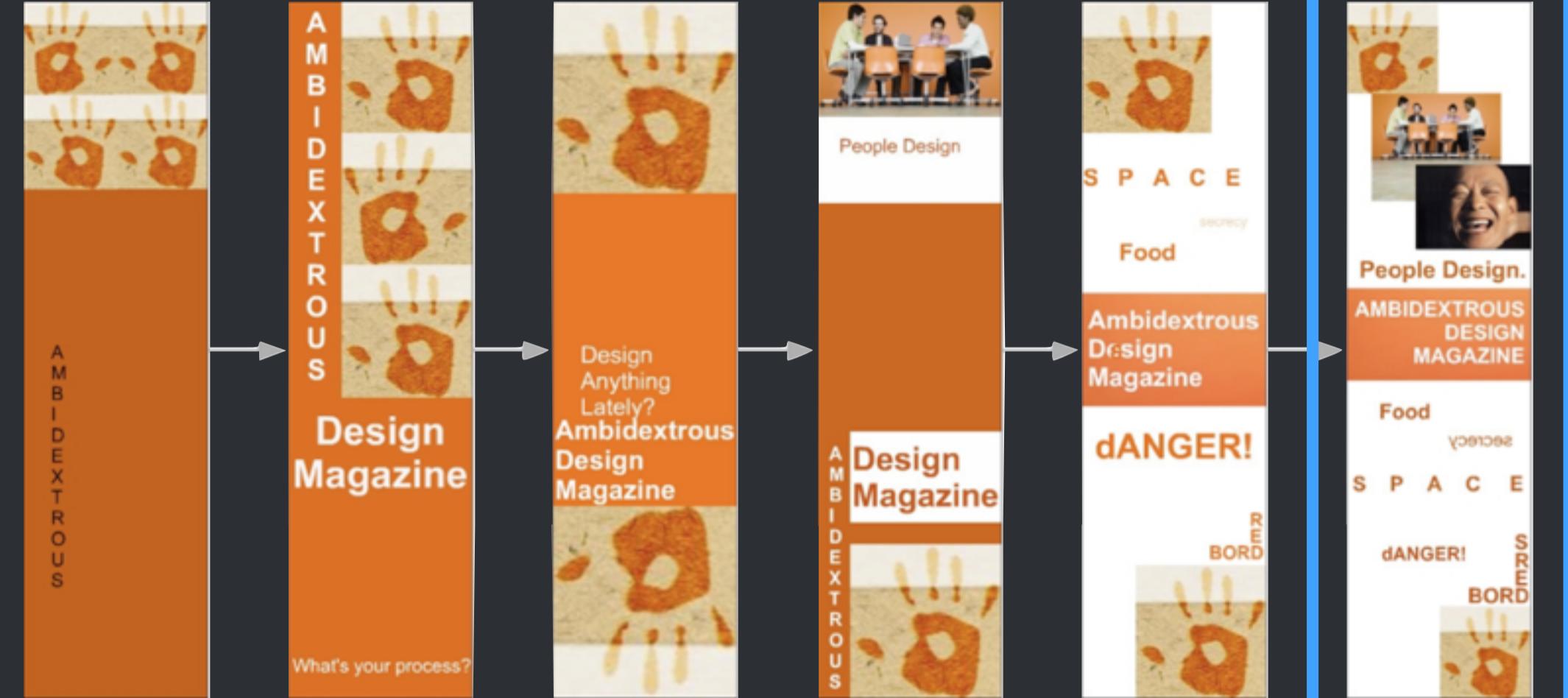
Prototyp

SERIAL

Task: Design a Web Ad (N=33)

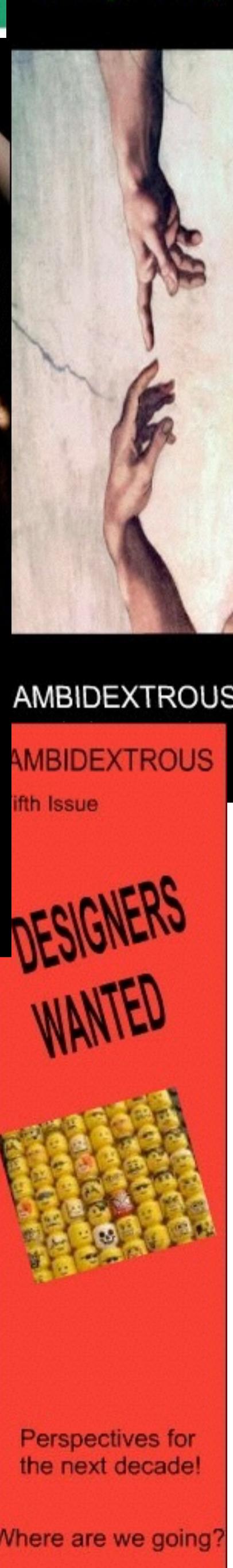
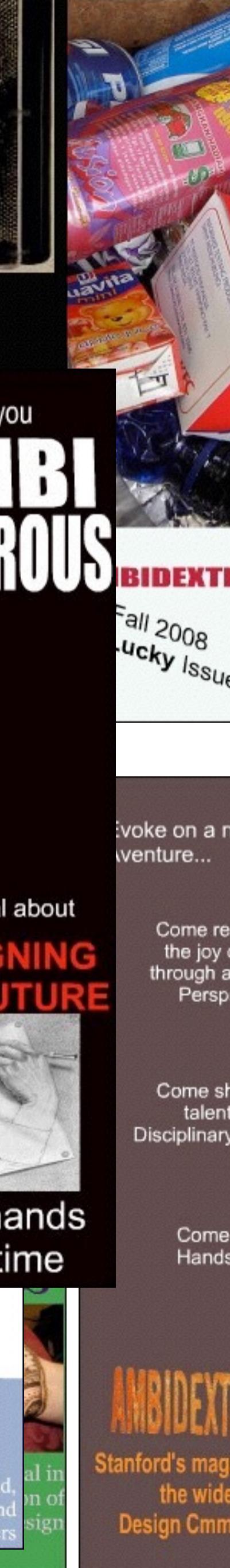
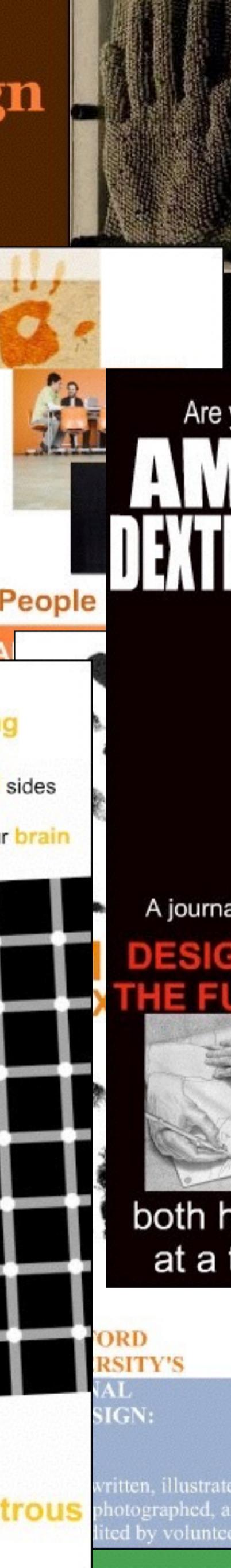
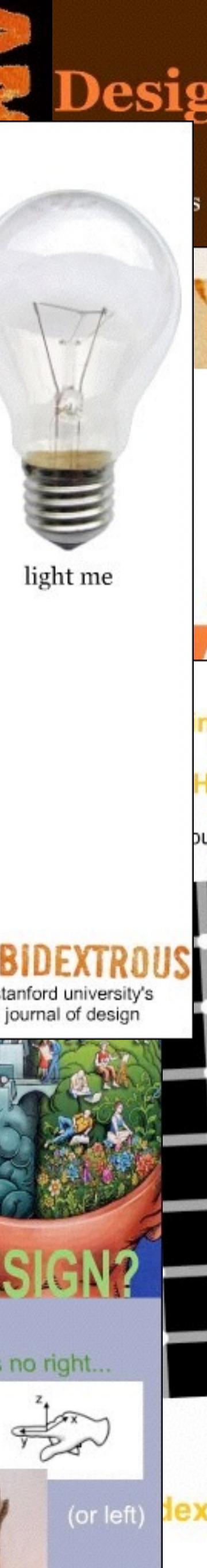
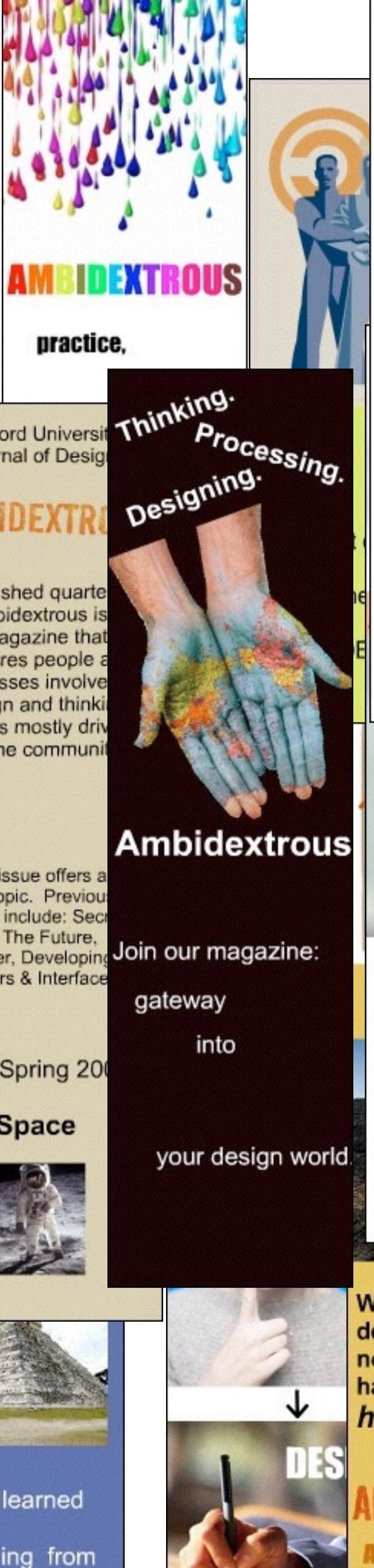
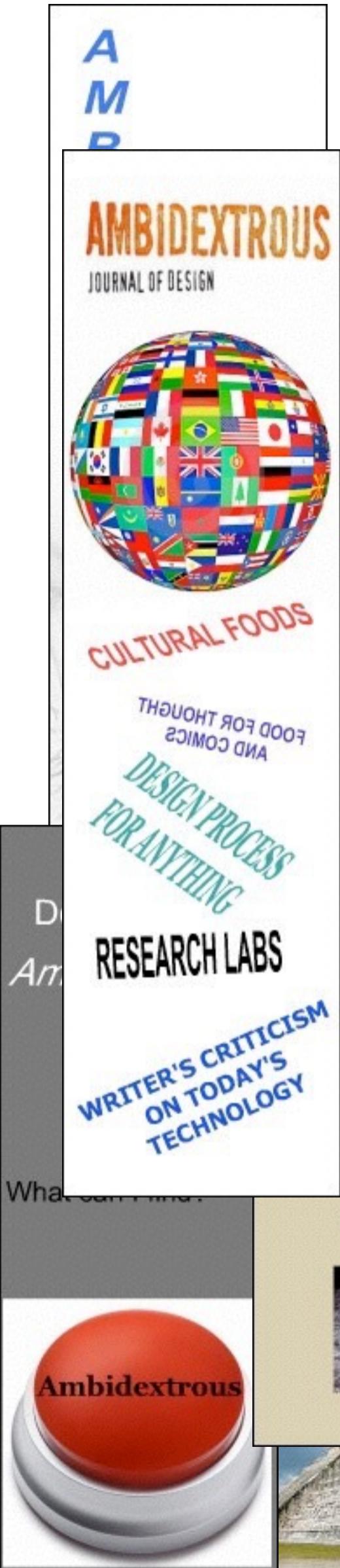
FINAL

serial
prototyping

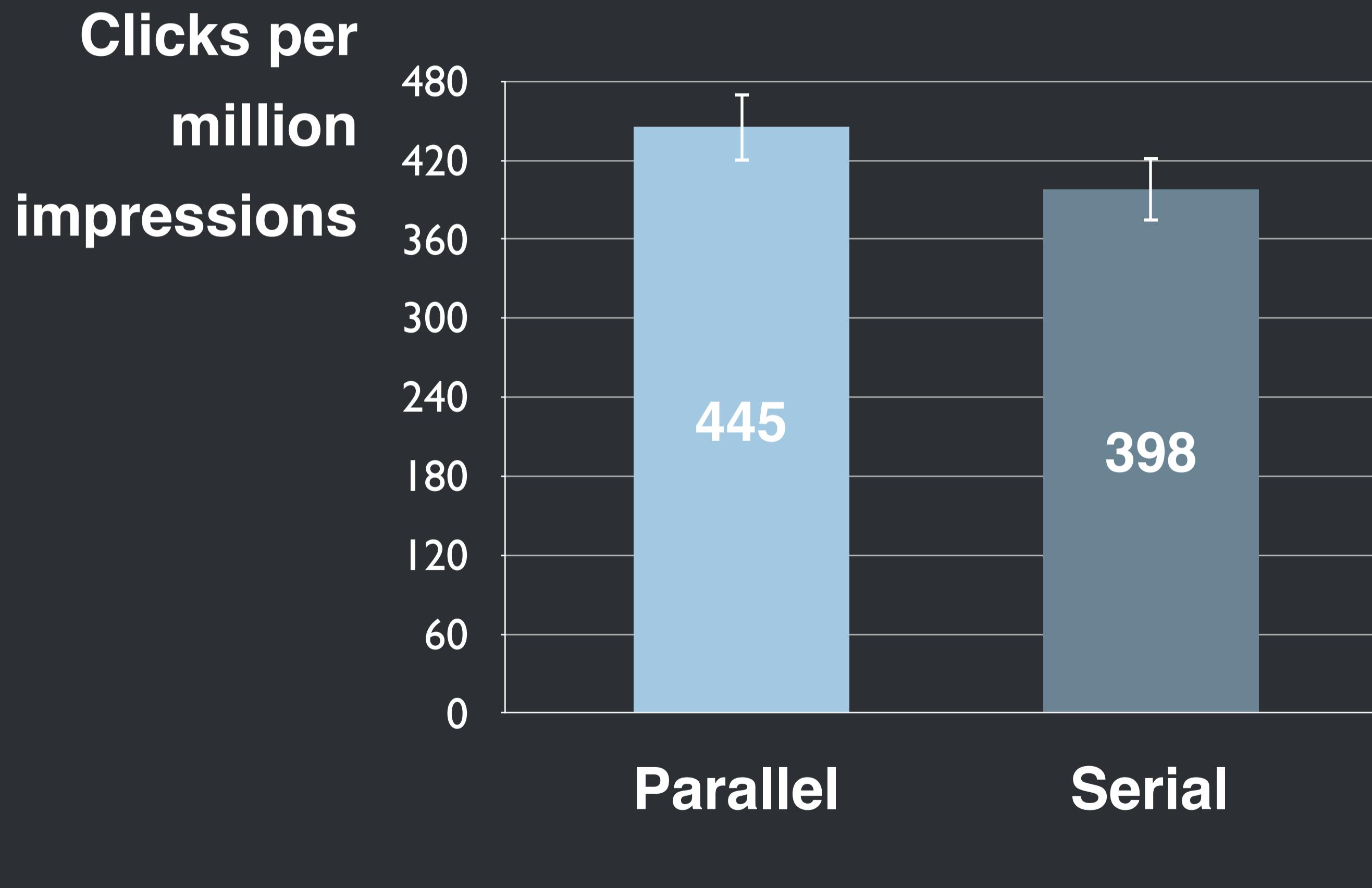


parallel
prototyping



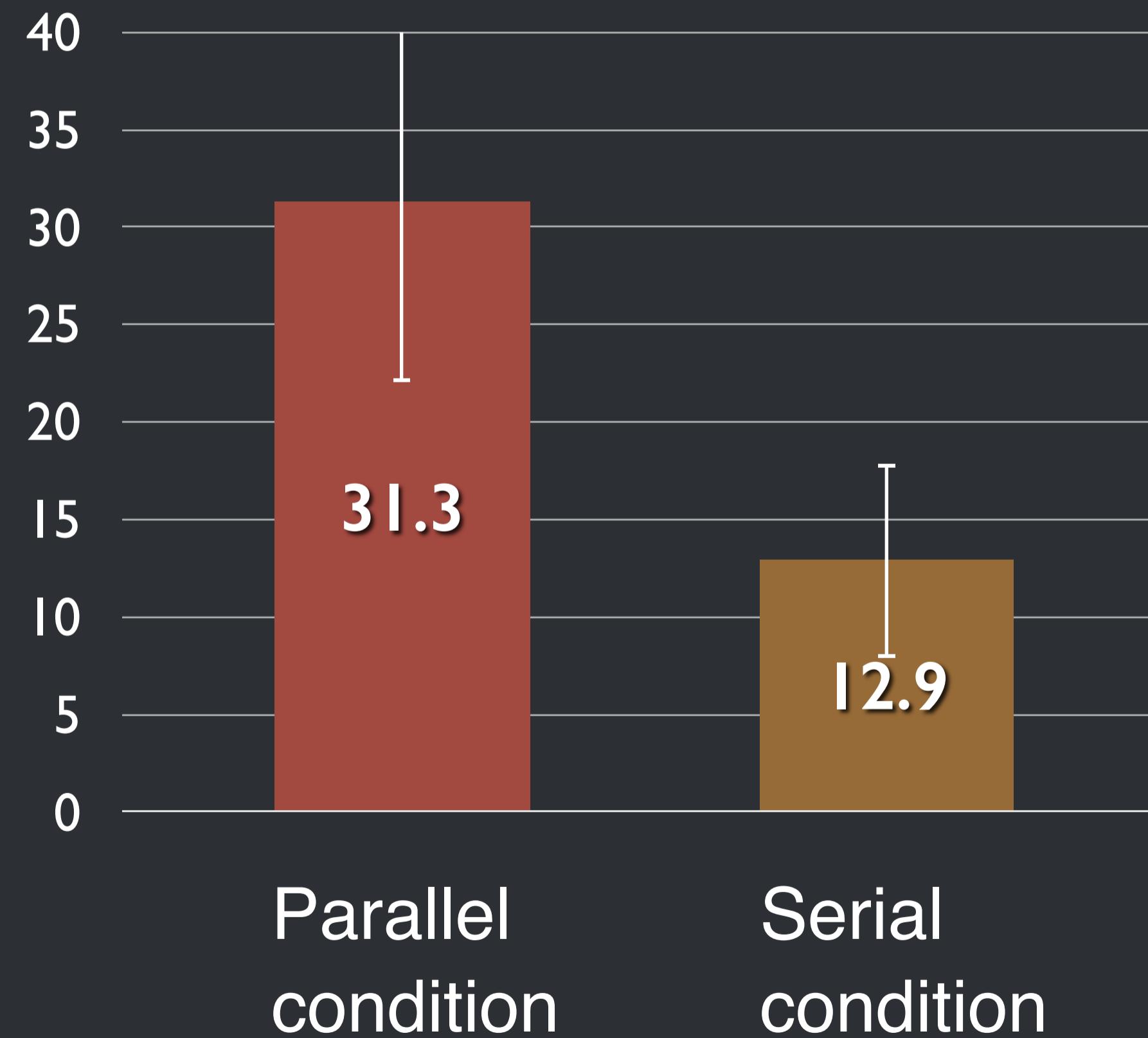


Parallel design -> more clicks

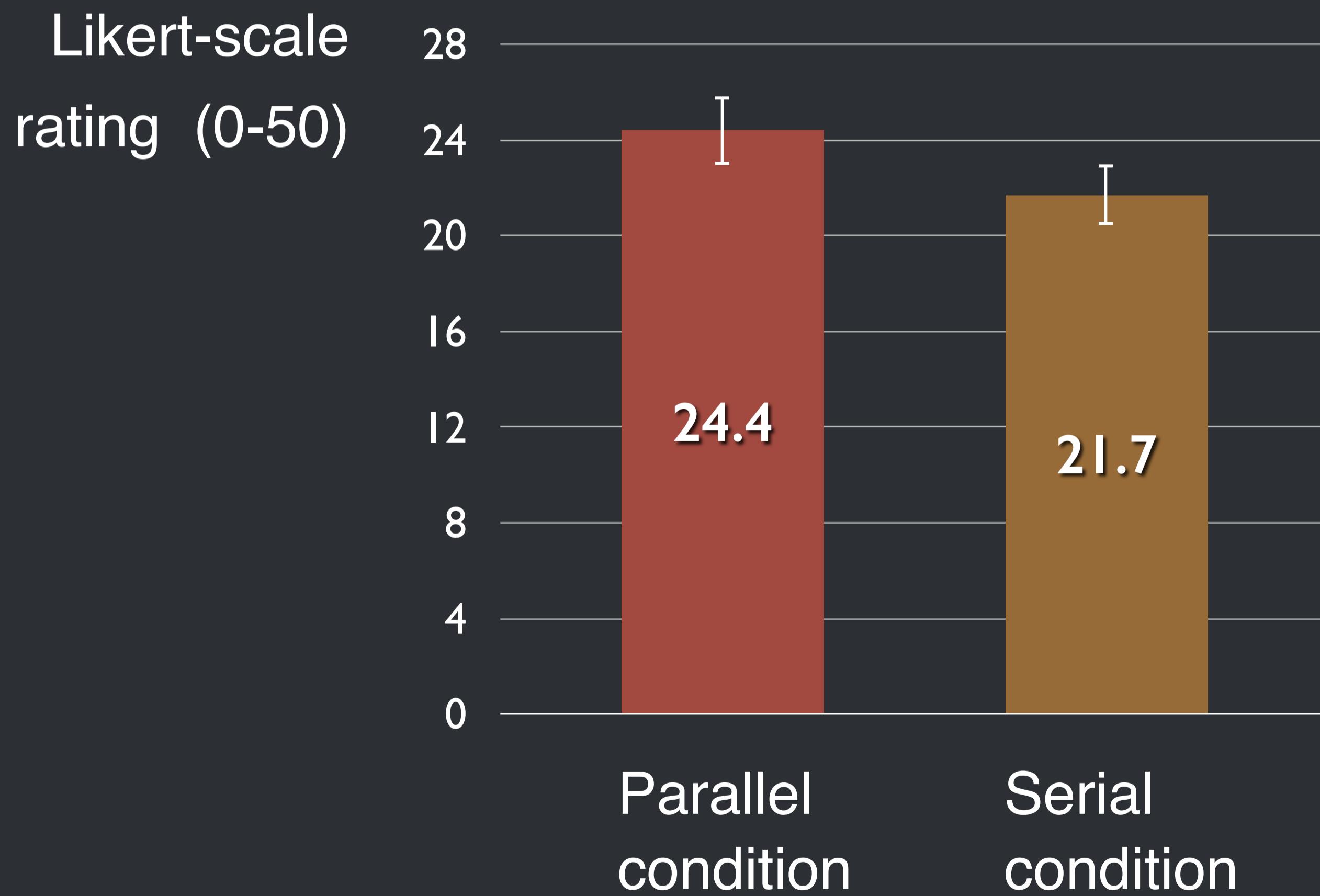


...and more time on the site

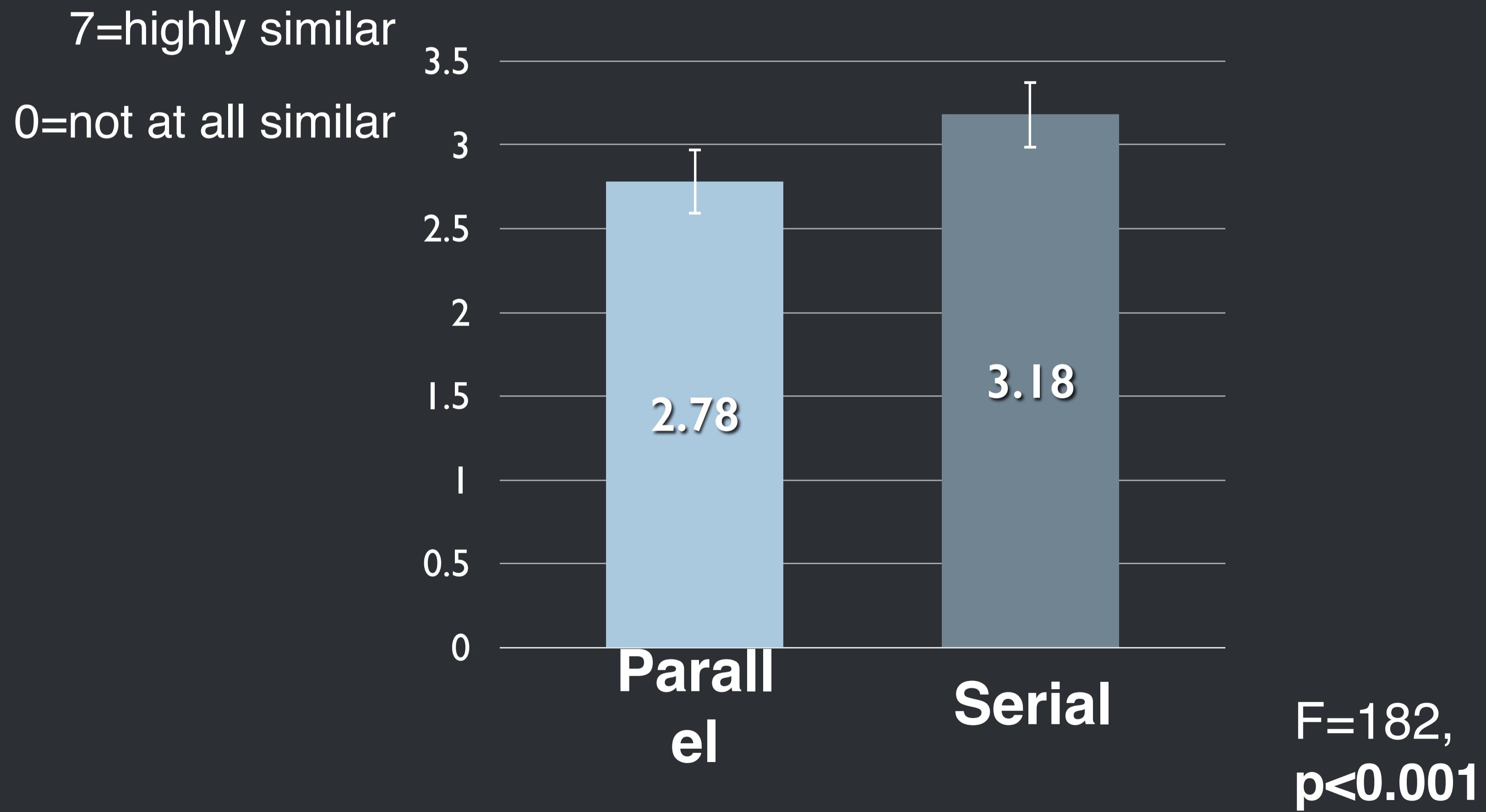
Average time
on client site
per visitor



...and higher expert ratings



...and more diverse designs



Comparison aids learning

training session

SEPARATE CASES

CASE#1

“Describe the solution.”

CASE#2

“Describe the solution.”

learning outcome

Solutions to a landlord-renter lease

COMPARISON CASES

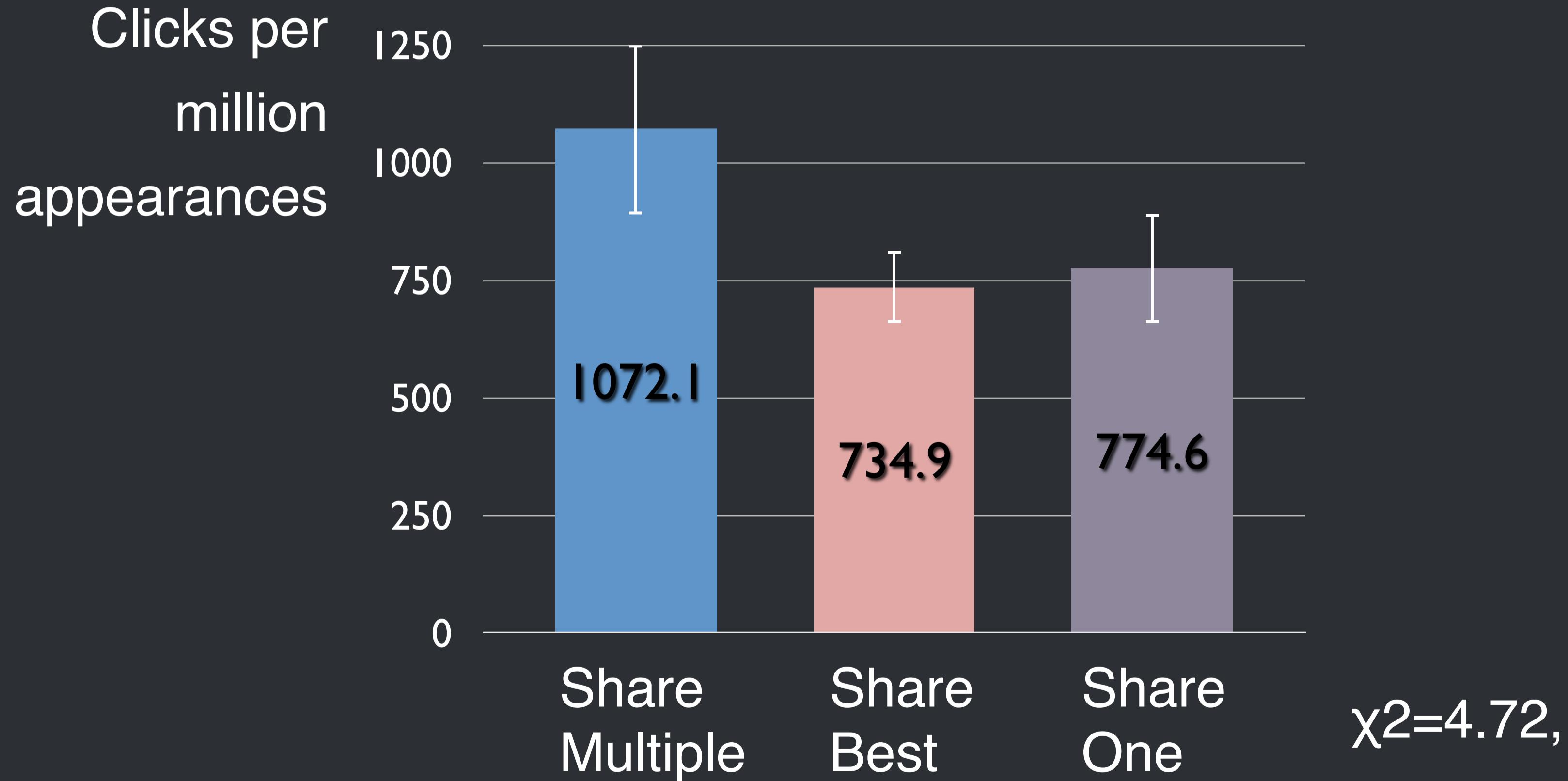
CASE#1

CASE#2

“Describe the **parallels** of these solutions”

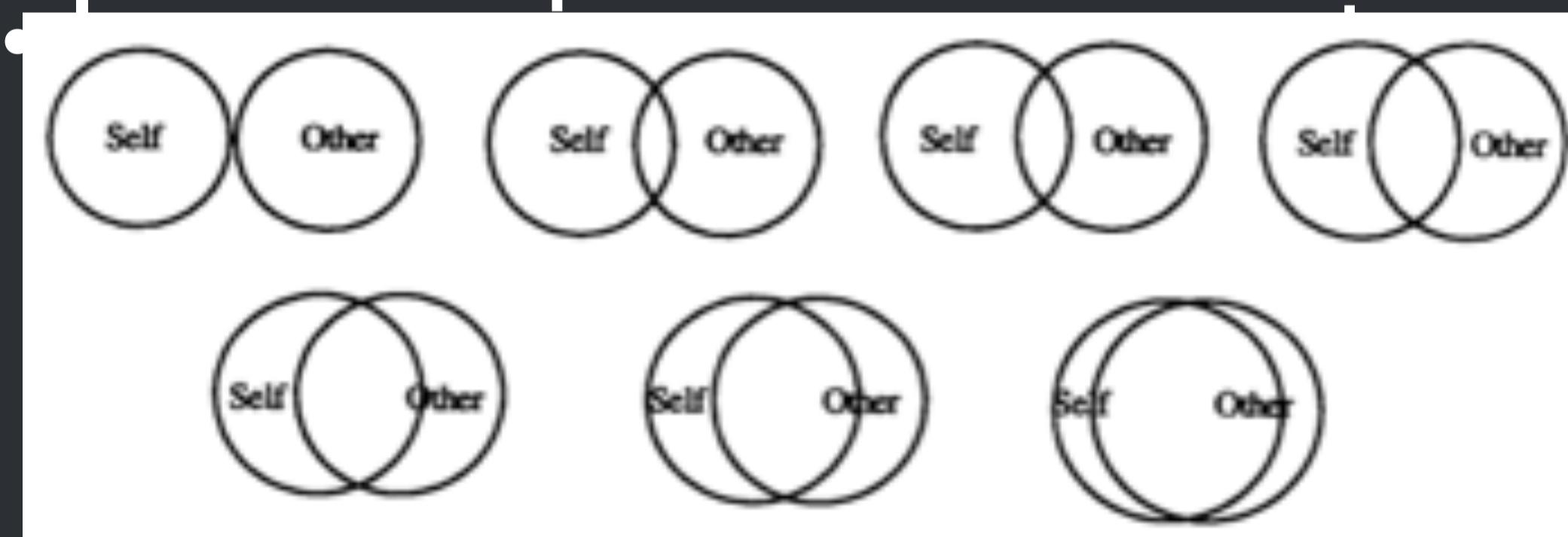
~ 3x

Share Multiple -> More Clicks



Benefits of sharing multiple

- More individual exploration
- More feature sharing
- More conversational turns
- Better consensus



Storyboarding activity

- Star people
- From setting to satisfaction
- What is a need/problem/setting?
- Find the fundamental need, not surface needs
- Avoid overtravelled paths
 - Help me find a study buddy
 - I'm hungry, where's cheap to eat? (have you tried Yelp?)

Storyboarding Tips

- Fold your sheet of paper in 4 so you can use the entire box as your frame
- Make it BIG
- Make it rough, no need for too much detail or artistry
- NO erasing!

Prototyping activity

Final Project Example

- Crowdsourced gift purchasing
<http://gifthub.herokuapp.com/home>

Announcements

- Quiz 2 next Tuesday
- One person submits team assignments