

Type, color, grid-based design

CSCI 3002 Fall 2018 - supplements

Case Study

In Situ Design for Mental Illness

http://pac.cs.cornell.edu/pubs/MoodRhyt
 hm_MobileHCI_06.16.15_final.pdf





Goal: Help patients regularize their daily routines, resolve interpersonal problems, and adher to

Hypothesis: Individuals with bipolar disorder have a genetic predisposition to circadian rhythm and sleep abnormalities responsible in part for symptomatic manifestations of illness.



Frank, E. Treating Bipolar Disorder: A Clinician's Guide to Interpersonal and Social Rhythm Therapy: New York Guilford Press, 2005.

Social Rhythm Metric

People	involved in	the activity: 0 =		ch day. Alone: 1 = Others presen		Date (week of): Feb 18 - 19 103 2 = Others actively invalved; 3 = Others very simulating by Wednesday Thursday				
Activity	Target Time			A STATE OF THE PARTY OF THE PAR	Tuesday				Smile	
		Time	adoa	Time &	Time 0	Time 9	Thursday	Friday	Saturday	
Out at bed	6:30	R-nn	-	2	2	Time &	Time of	Time 8	Time 9	
First contact with other person	8 4000	O com	0	6:15 m 0	8020	6 45 a. O	700,0	8.02.0	2	
Start work/school/		The same of the sa		Y I VUIGN	11-00 in a	- # 14-17				
volunteer/tamity care			_	0 10 m 7	11 40m	8 10- 2	1060 1	1000 00	7	
Dinner	1	-	0	or O	3 Hopm C) 3 30pm O	530m0	530 n	Pa	
To bed	12 00pc	2.10pm	0	30-0	12 30 0	2:00-0	1,0	500	Dugn O	

Monk, T.H., Frank, E., Potts, J.M., & Kupfer, D.J. (2002). A simple way to measure daily lifestyle regularity. Journal of sleep research, 11(3), 183-190.



"The intrinsic nature of psychiatric disorders that very often compromises decision-taking procedures – may cause even greater impact of non-adherence to prescribed medications" Colorn, F., E. Vieta, M.J. Tacchi, et al., (2005). Identifying and improving non-adherence in bipolar disorders.

- Deficits in performance IQ
- ☑ Disturbances in attention & concentration
- Short-term memory impairment
- Limitations in executive function
- Hypersensitivity to reward-relevant stimuli
- Above-average creativity





Notes

"I like the Green->Orange->Red (initially I wasn't mind)." P4

"On an ongoing day just the difference between red and green can make a difference. It's good to see green." PI

"...make the whole event box turn green, orange or red for more of a dramatic effect." P5

"How about a full green circle, a ½ green circle, and empty?" P4

Self Tracking RECORD Q () "TTEN Out of Bed Target 0800 0 1800 018 O First Contact

① **OD**

OD

00

Target 08.30

O Dinner Tarpor 1800

Go to Bed
Target 22,00 0

Start Work
Target 01:20 3 97:28 GED

5 4 3 2 4 9 1 2 3 4 5

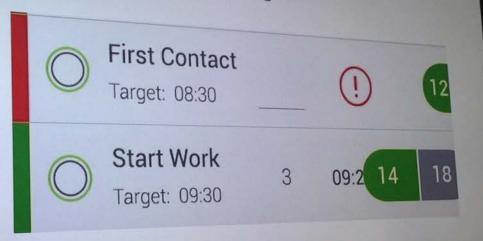
"Track why I didn't track"

"If you miss a day, you can't really go back and input accurate info. But from a simplistic reasons you might not log.

You're down, just forgot, or manic-y and can't be bothered. It would be cool if on days you missed you could have a drop box where you chose why you didn't enter anything. It would be useful data." P2



"Streak" displays current run of days in a row that patients have achieved their goal





Rewarding Interactions

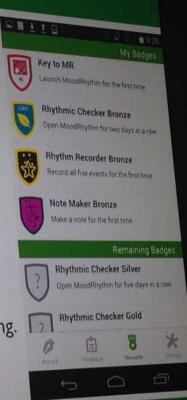
All participants were enthusiastic about the badges:

"I like the rewards" P5

"I think the badges are kind of cool" P3

"Yes, I LOVE badges" PI

"I got the badges. It gives me personal satisfaction that I have completed something. And, that's good. It keeps motivating." P7



Badges



"As far as badges, I don't really find that especially compelling in so much as "unlocked achievement reward", but that's just me. It is a nice marker to have one show up that says "you've completed this task for X days", and I find that a good informative measure for sure." P6



Rewarding Interactions

Mobile health interactions can be rewarding, informative, encouraging and reinforcing

Prior ex situ work indicated "gamified" interactions

Our in situ deployment of elements like badges received positive responses from participants who found them:

- encouraging ("you can do this")
- informative ("you've done this X times before")
- 3. empowering ("you've managed this before")

MoodRhythm App



Take Aways Characteristics of mental illness and patient experience can have an important impact on the design of digital interventions In situ design can be used to provide ecological valid input into the design of digital interventions for people with serious mental illness

Personal Informatics in Interpersonal Contexts: Examining the Social Ecologies of Long-Term Mental Health Management (to appear at CSCW 2018)



Stephen Voida Faculty, CU



Faculty, UW



Postdoc, Stanford





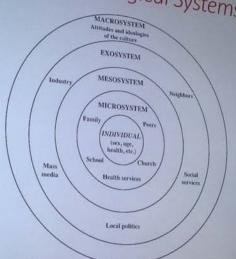


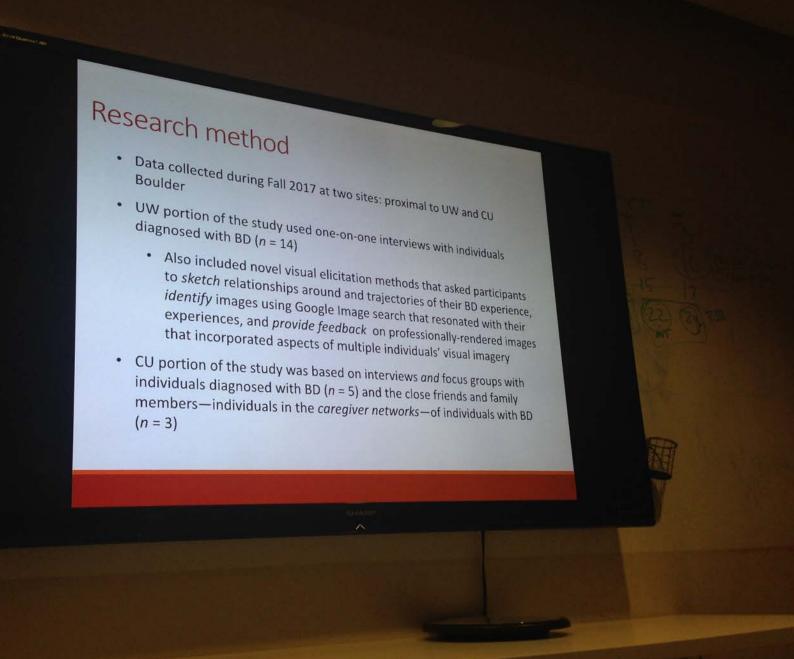


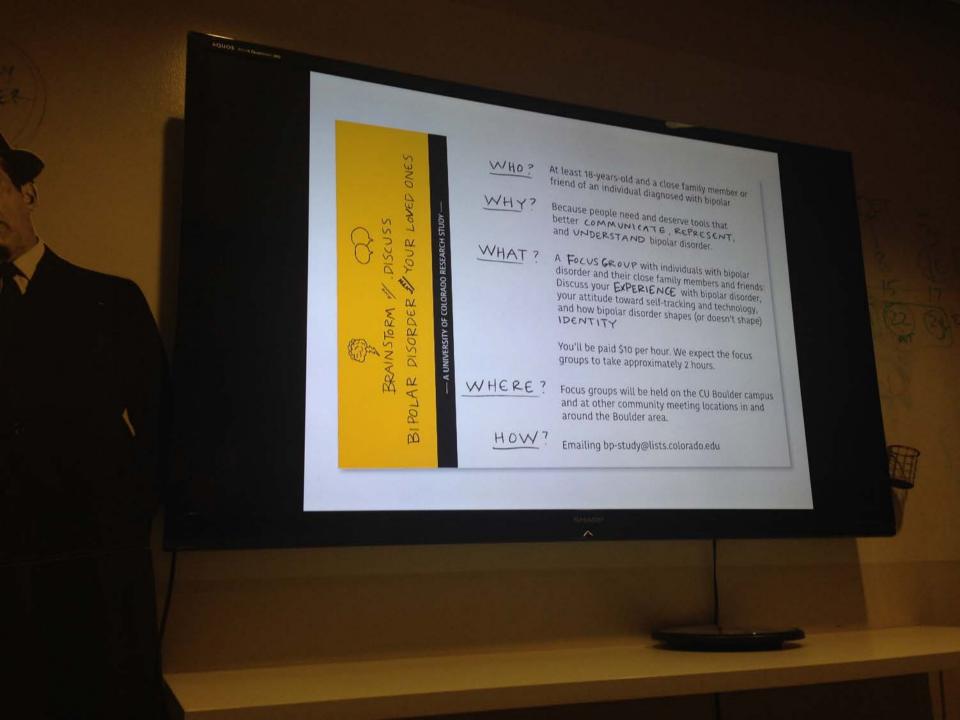
PhD student, CU PhD student, UW PhD student, UCI CTO, HealthRhythms

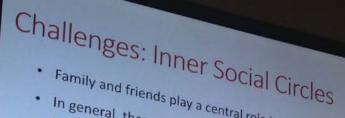


Original conceptual model:
Bronfenbrenner's Ecological Systems Theory





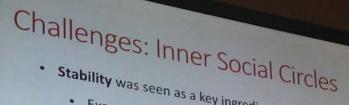




- Family and friends play a central role in BD management In general, these individuals were highly valued for their emotional,
- Some participants relied more heavily (and had a stronger affinity for) their

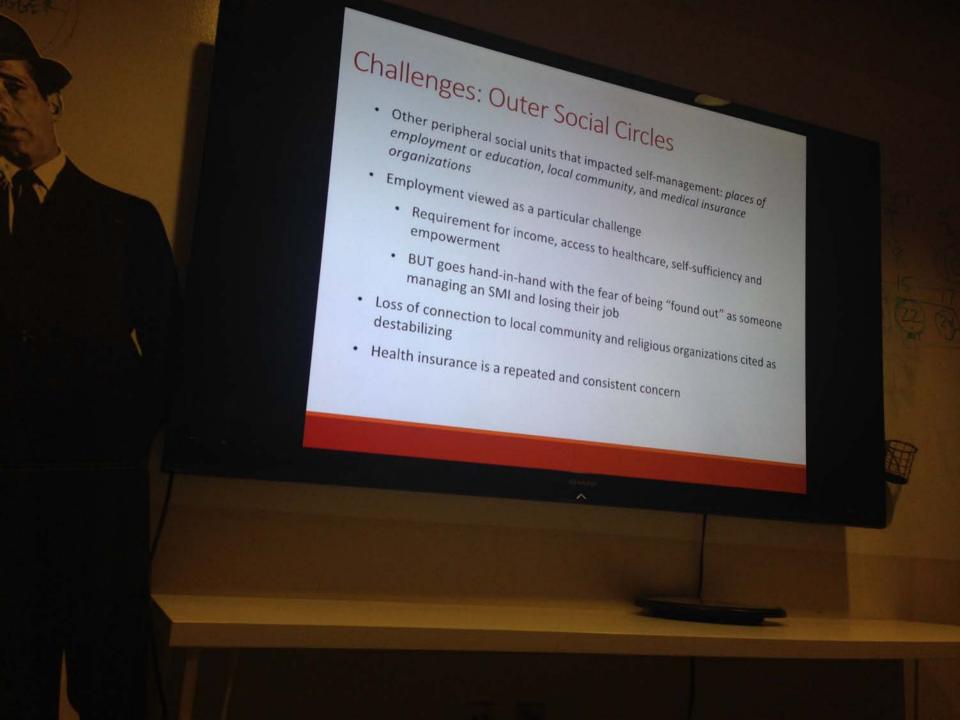
"I rely on nothing from my family with regard to any kind of illness. If I didn't have the same DNA as my parents I would not even have contact with them again.... So I think a lot of people wind up getting much more support because they can choose their friends. They can choose people that are going to help them."

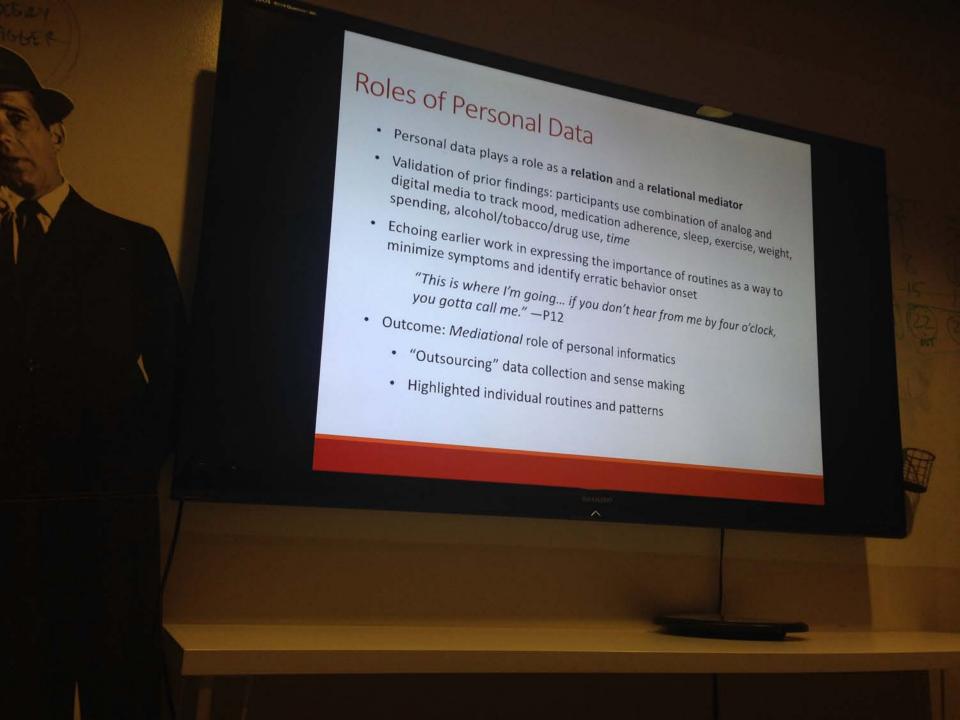
Family members' prior awareness and attitude towards mental health was a strong determining factor in their reaction to and support of BD



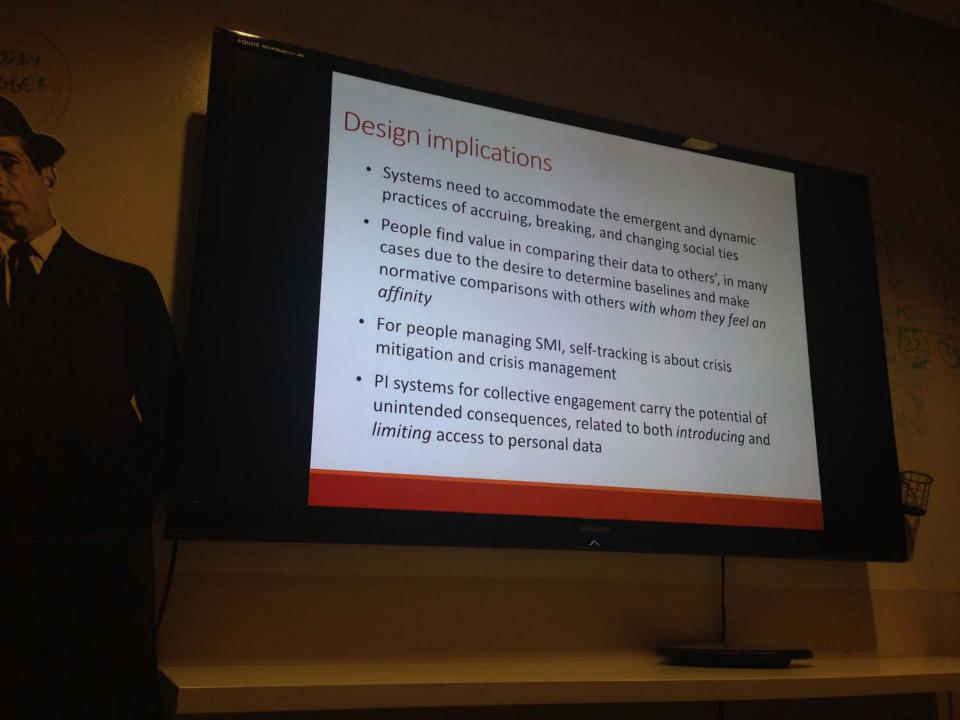
AQUOS TOWN

- - **Stability** was seen as a key ingredient in supportive family and friends. Example: one participant sought a partner who would be extremely
- Recognition that change is an inevitable part of long-term SMI
 - In some cases, change is a positive thing
 - Example: "You have friends and relatives that come in and out of your life that are going to be able to handle it or not, and it takes a while to get a caregiver support network that meets your needs." [P6]
 - In other cases, instability were perceived as particularly distressing (e.g., deaths, divorces, relationship break-ups)





Personal Informatics, Collective Engagement transitions, socio-Sociocultural context historical events deologies Indirect institutional influences Economics INTERACTION PROPERTIES Valence MICROLAYER Intensity Closely involved ties Core Direction givers Support groups Dynamism ~ M~ Friends Person Relational & mediating roles of personal data with SMI



Today

- Continuing our discussion about contrast and spacing
- Visual perception intro
- Elements of design: color and type

Quick note about the quiz

- Will be 3-5 questions, 15 minutes
- Covering everything through next Thurs
- Focus on the major concepts we've covered in lecture & recitation, and how to apply them
- Less about knowing precise definitions

Example Q

3. You are designing an app to help people find nearby coffee shops. Using the following data, sketch out the search results page. Use the principles of **proximity**, **alignment**, and **contrast** in your design, and explain how each of these are used to communicate information about the coffee shops (3 points).

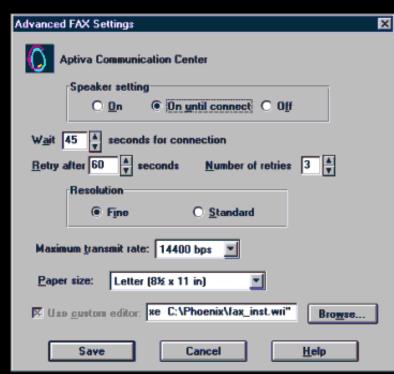
Name	Address	Star rating	
Boxcar Coffee Roasters	1825 Pearl St	5	
Ozo Coffee	5340 Arapahoe Ave	4	
Dunkin Donuts	3235 28th St	2	

Some follow-up from last time

- Contrast
- Visual hierarchy
- Minimalist design
- Visual perception

Consequences of UIs with bad visual design

- What can I do?
- In what order do I do things?
- What's important?
- What just happened?
- I can't find what I'm looking for :(



Contrast

- What it's good for:
 - Making things stand out from the background
 - Showing groups

How to control contrast of an element

Bold text

small and large sizes

Contrasting color choices

Shape:

Button

Button

Button

Local vs. global contrast

 Some things can globally increase visibility and draw attention: big size, bright colors, animation

- Others are relative to the existing context
 - Even though this entire paragraph is red, the less saturated color stands out.
 - And here the opposite is true.

Combine multiple factors

- To make text stand out, don't just change color or SiZe or boldness (weight);
 use a combination of these
- This can help for users who can't perceive one (like on a screen under bright sunlight or a black&white printout)
- Gives us an alternative to <u>underlining</u> and italics, which can be unattractive or distracting

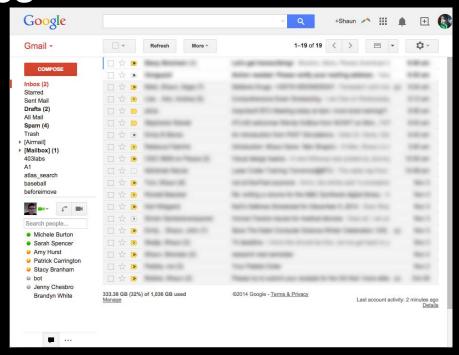
Visual hierarchy

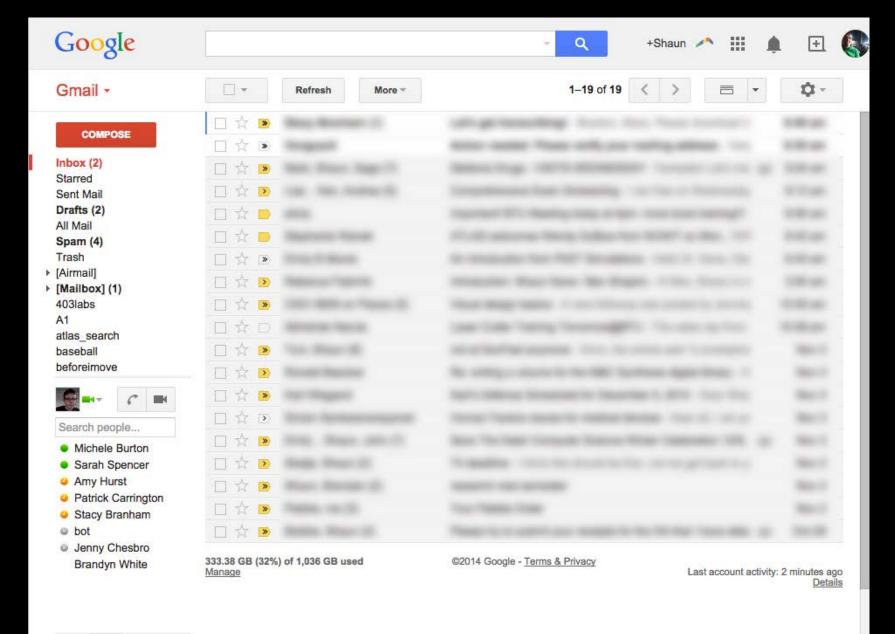
 One of our goals in visual design is to communicate the relationships between elements using contrast and spacing

One part of this is to communicate groups of things

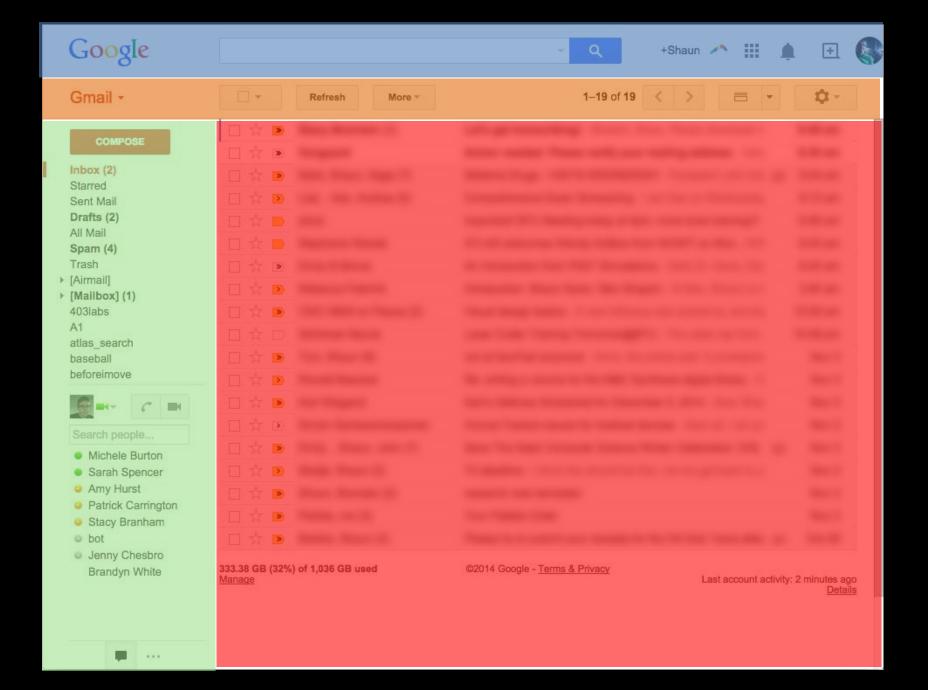
Visual hierarchy

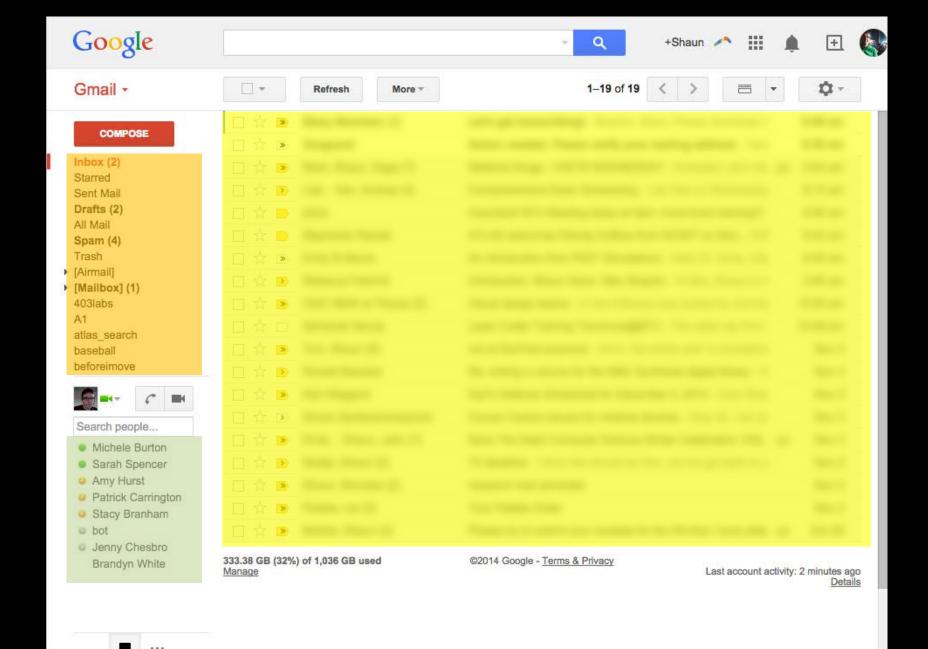
 At a more advanced level, we communicate a hierarchy of nested structures

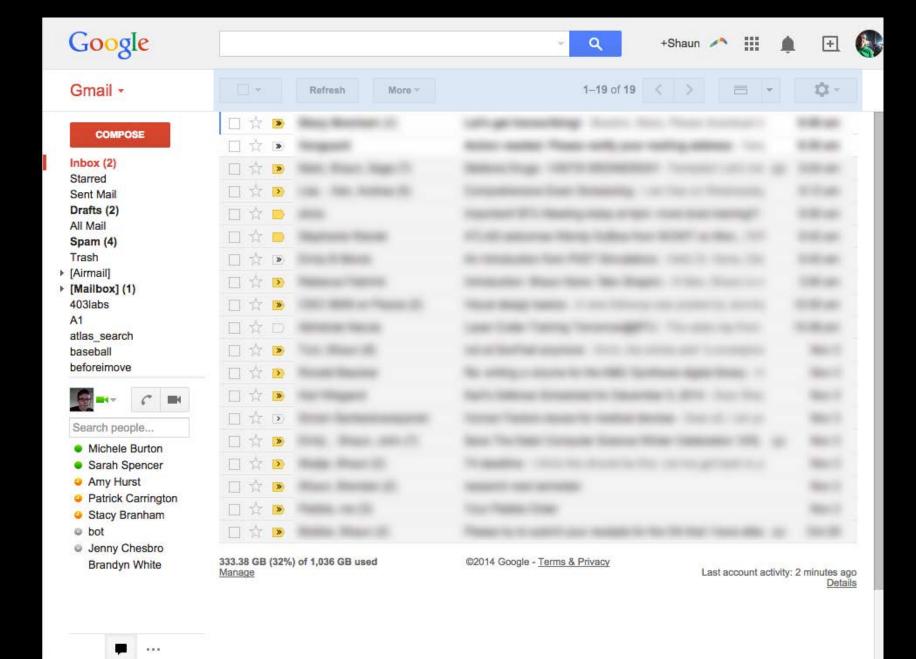




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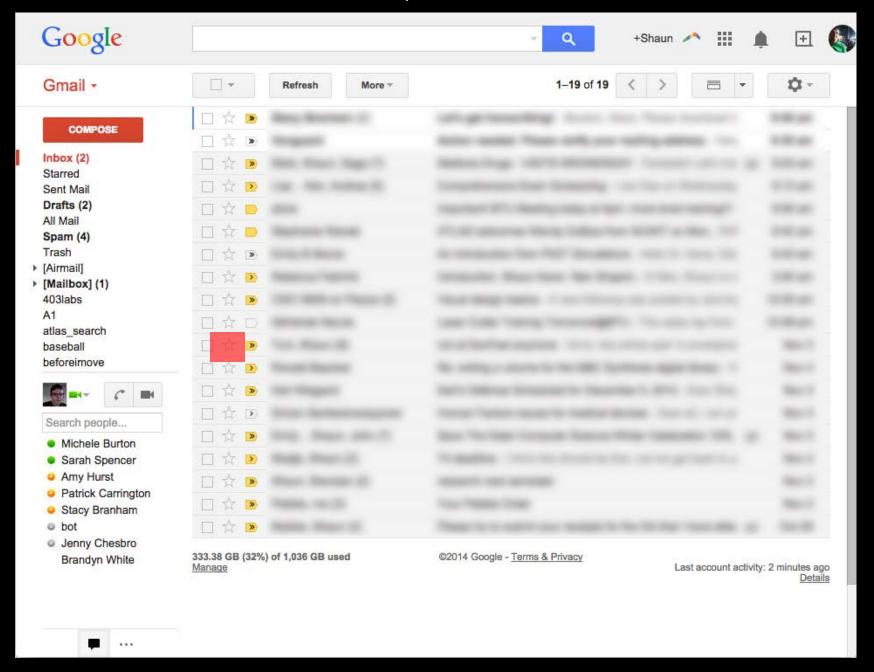


□ ▼ Refresh More ▼ 1–19 of 19 〈 〉 🗏 ▼

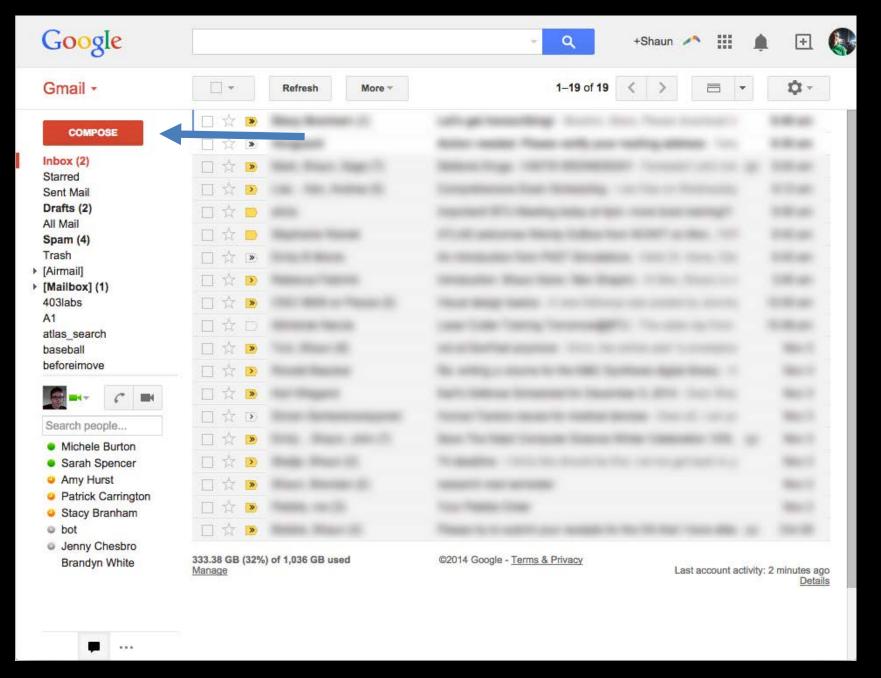


So what?

What does this button affect? How do you know?



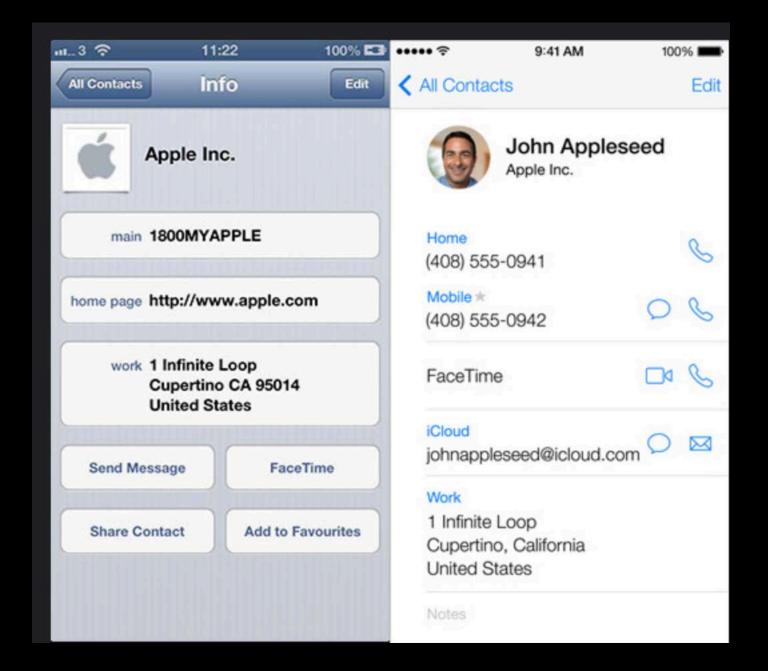
How about this one?



Quick note on minimalist design

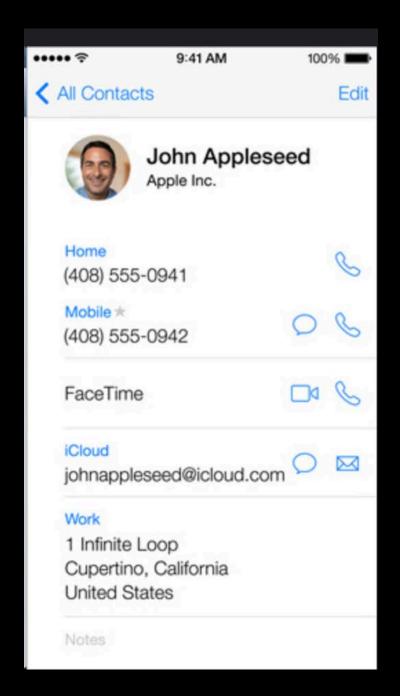
- It's very common to argue that a design is the way it is because of "simplicity" and "minimalism"
- Good designs can be minimalist
- But *good* minimalist design is hard, and minimalism can be an excuse to be lazy

When info is lost

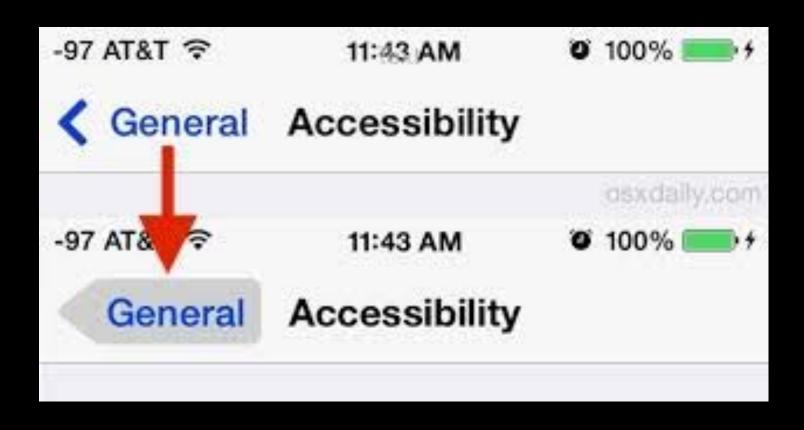


Critiquing iOS buttons

- How big is the button?
- Which blue text is a button and which isn't?
- Should buttons look the same as HTML links?



iOS button shapes accessibility feature



Convention vs. UI design

- Sometimes we know how a UI woks because we've seen it before
 - e.g. close buttons in the op left
- Other aspects are communicated in design
 - Color contrast
 - Red = important?
 - Visual hierarchy



Visual perception

 Some slides from Jon Froehlich @ UMD: <u>http://www.cs.umd.edu/~jonf/index.html</u>

Slides:

http://www.cs.umd.edu/class/fall2014/cmsc434-0101/CMSC434_Fall2014_Lecture22-VisualProcessingEmotionalDesignAesthetics.pdf

Clicker warm up

What's new and exciting?

A: something

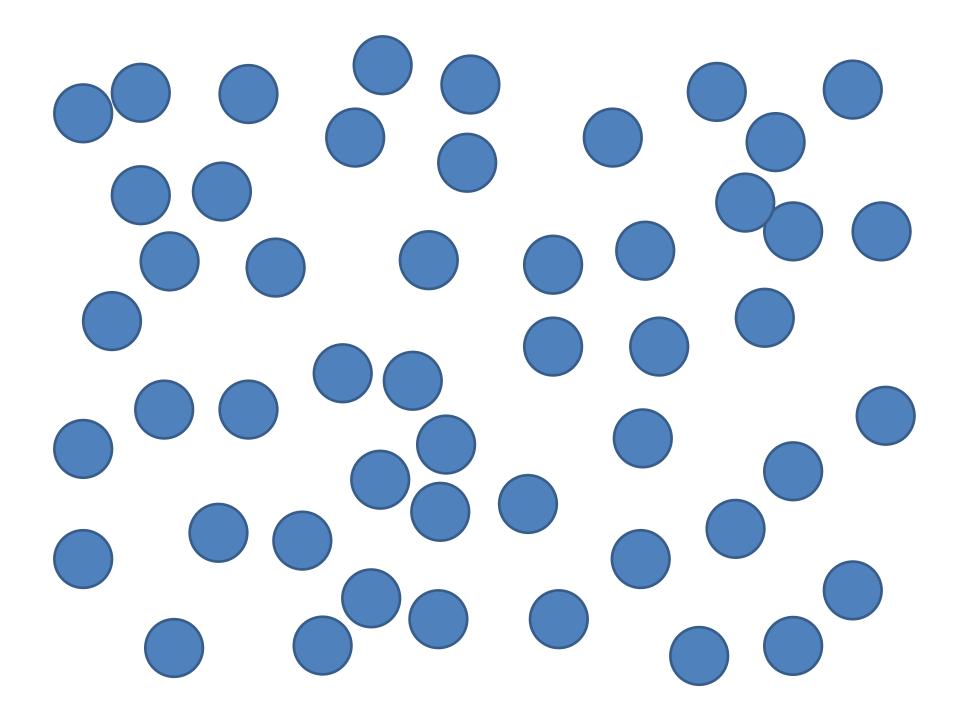
B: nothing

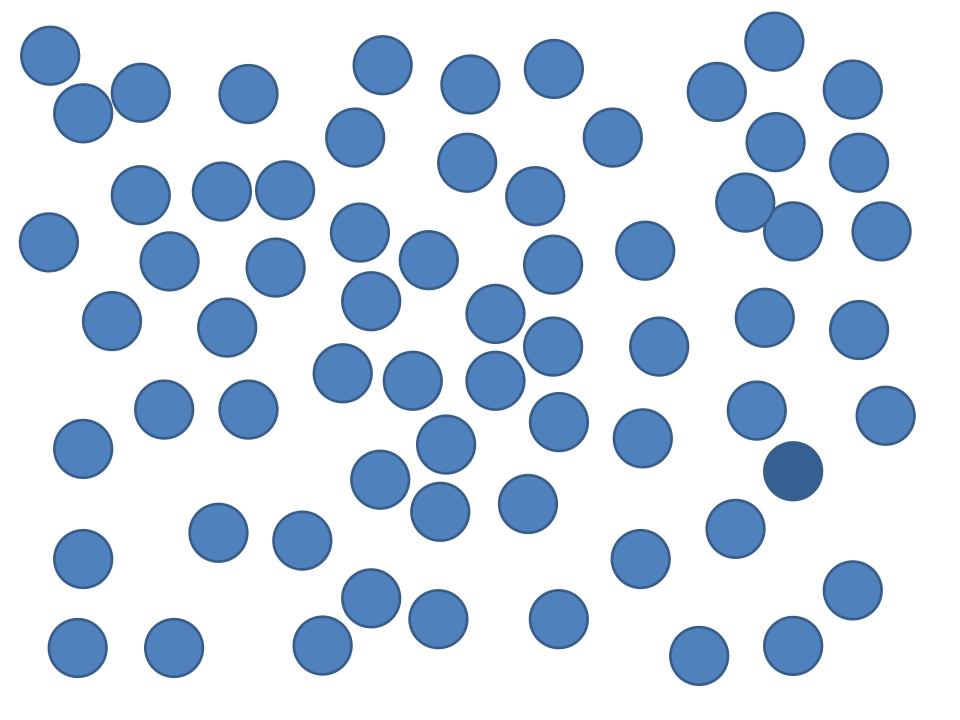
Human perception plays an important role in the area of visualization. An understanding of perception can significantly improve both the quality and the quantity of information being displayed.

- Ware, 2000

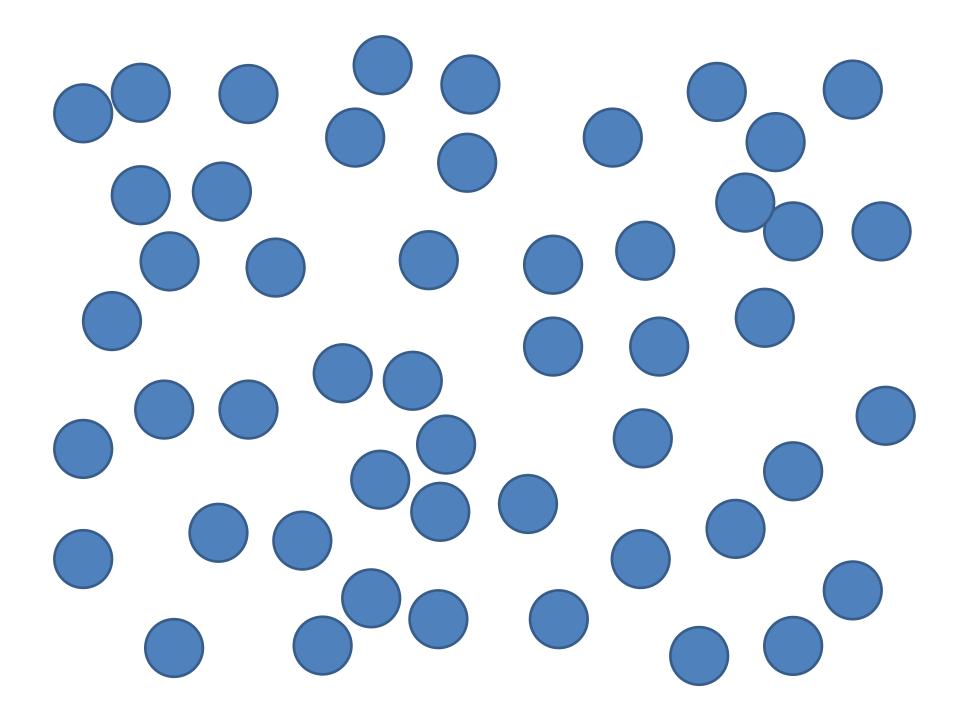
Ware, C. Information Visualization: Perception for Design. Morgan Kaufmann Publishers, Inc., San Francisco, California, 2000.

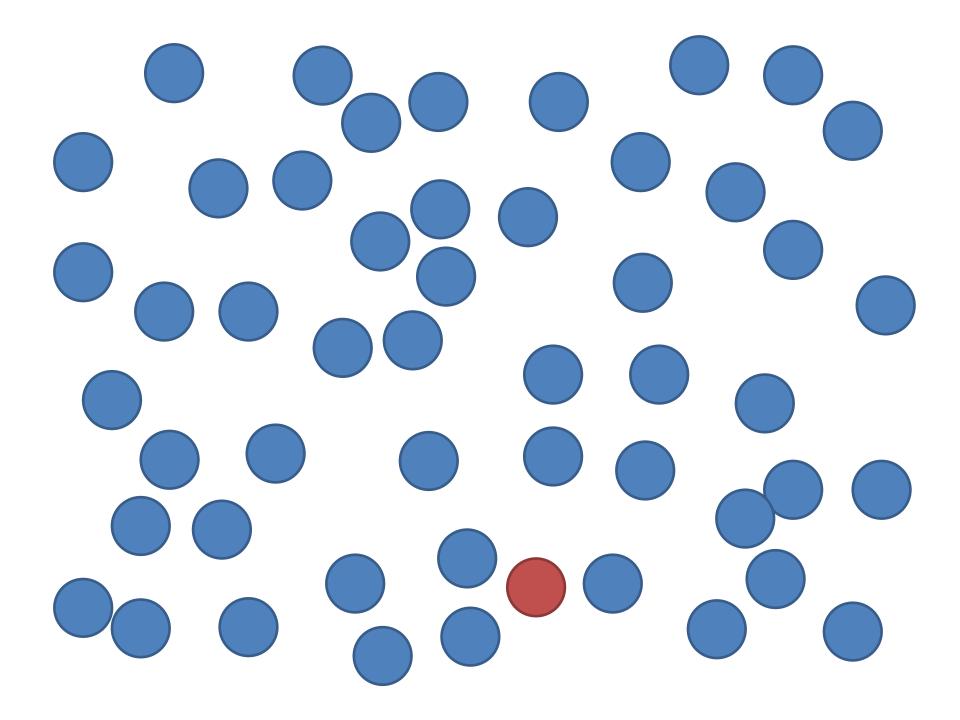
Press A on your clicker when you see the element that is a different color than the rest





Let's try again.

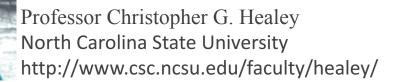




Pre-attentive Processing

a limited set of visual properties that are detected very rapidly and accurately by the low-level visual system

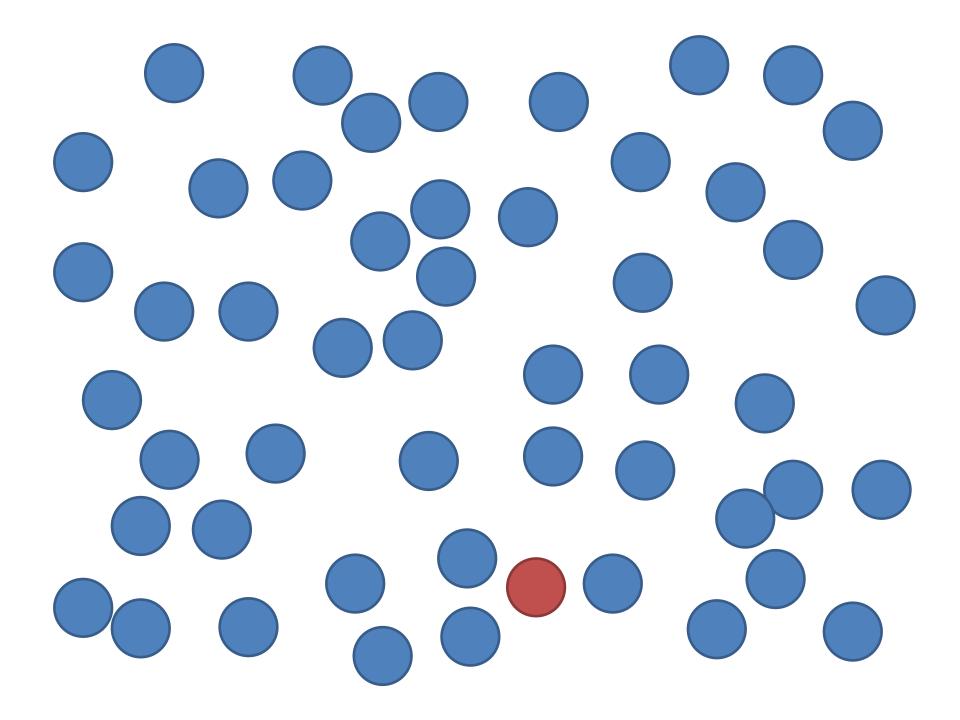
Actually, not really preattentive... these visual properties were initially called preattentive, since their detection seemed to precede focused attention. We now know that attention plays a critical role in what we see, even at this early stage of vision. The term preattentive continues to be used, however, since it conveys an intuitive notion of the speed and ease with which these properties are identified.

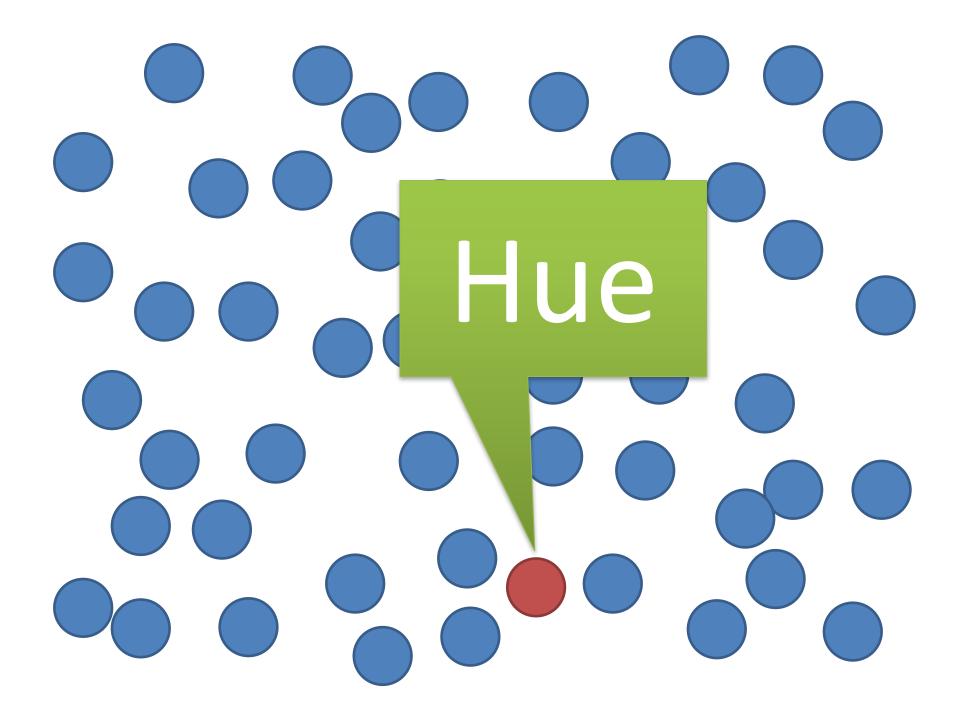


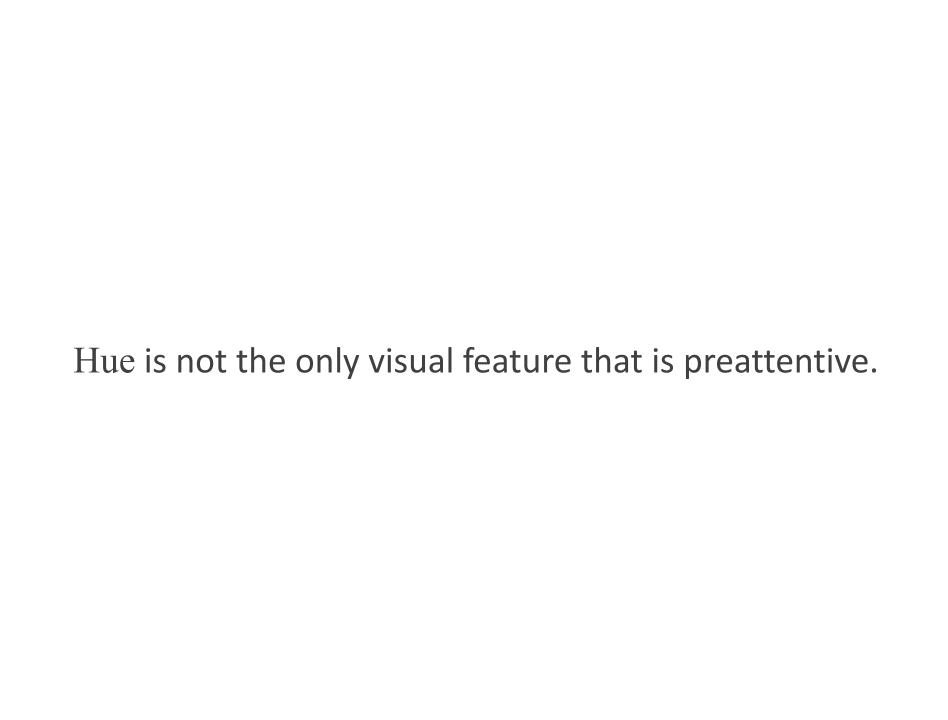
What can be considered preattentive?

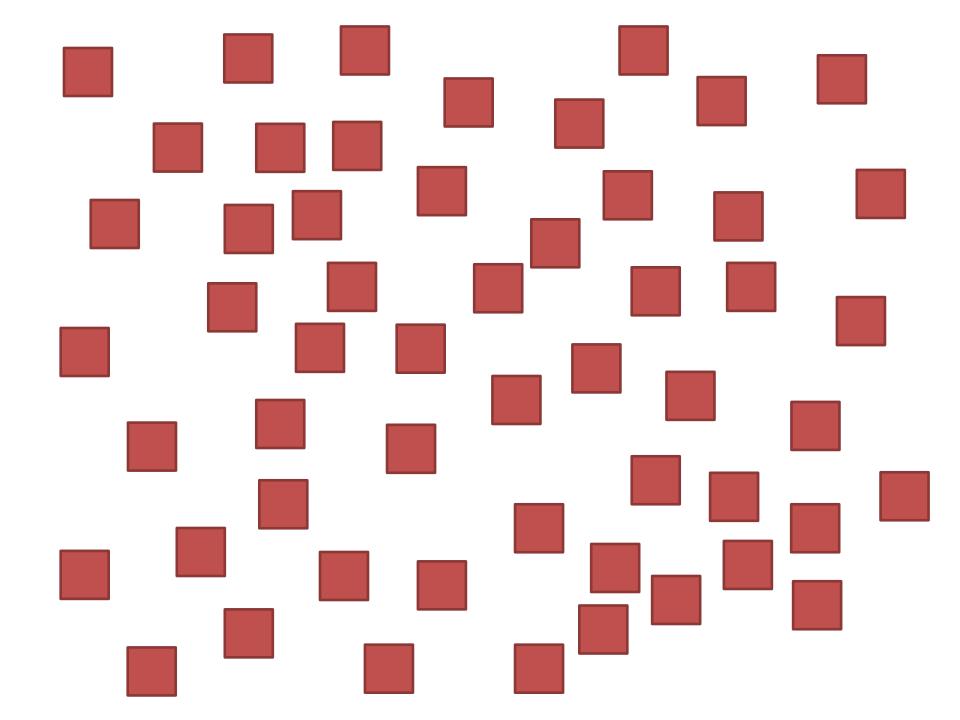
Typically, tasks that can be performed on large multielement displays in < 200-250 ms

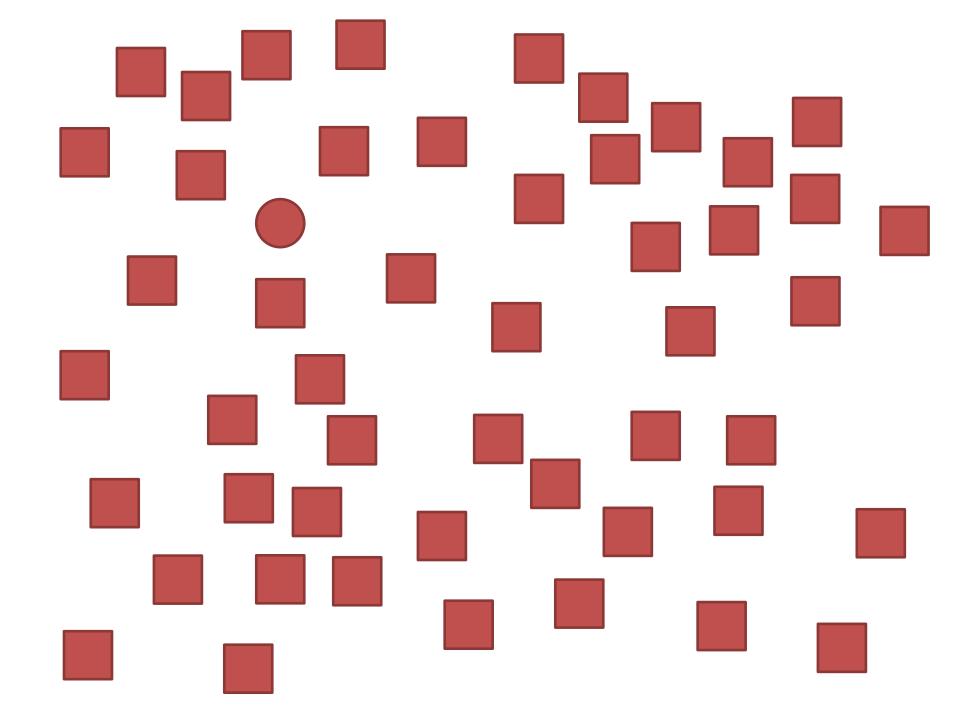
Eye movements take at least 200ms to initiate. In experiments, viewers are able to accomplish tasks in ~200ms, which suggests parallel processing of information by low-level visual system

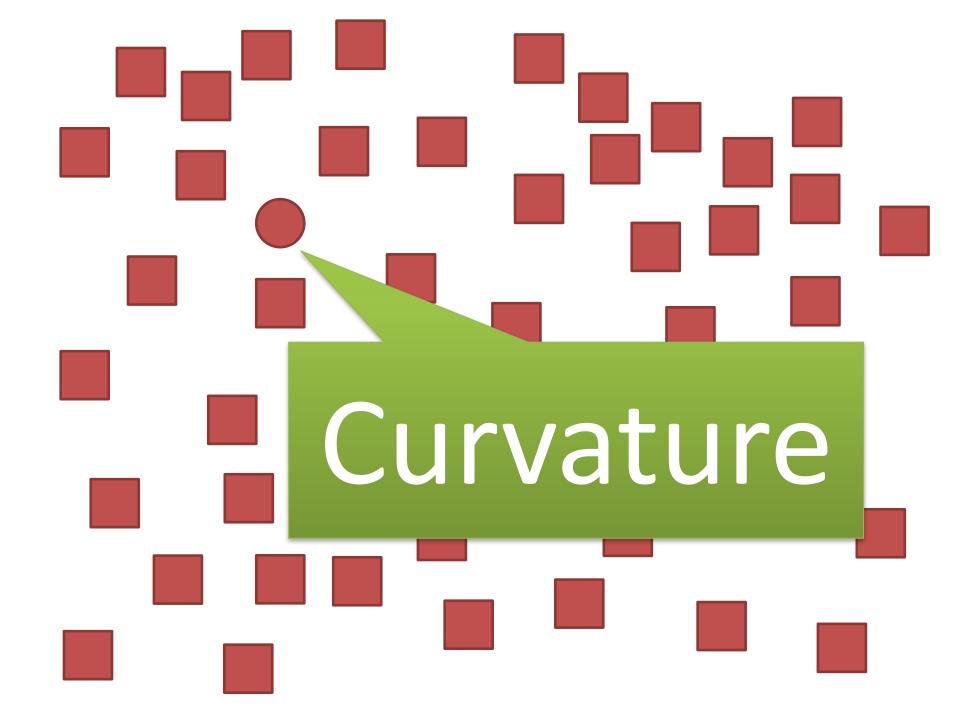






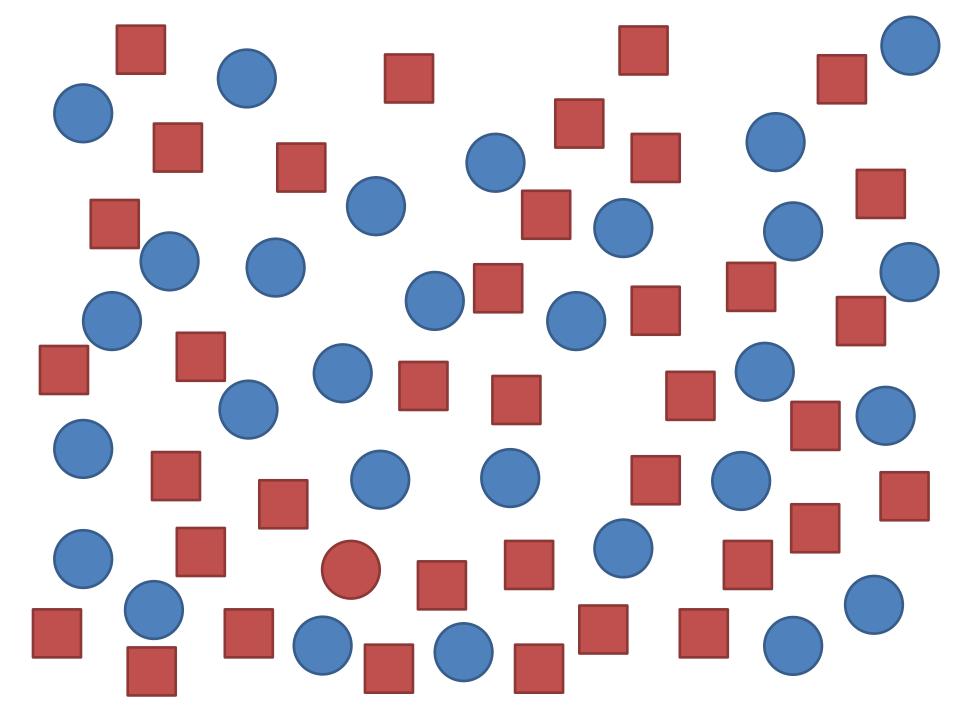


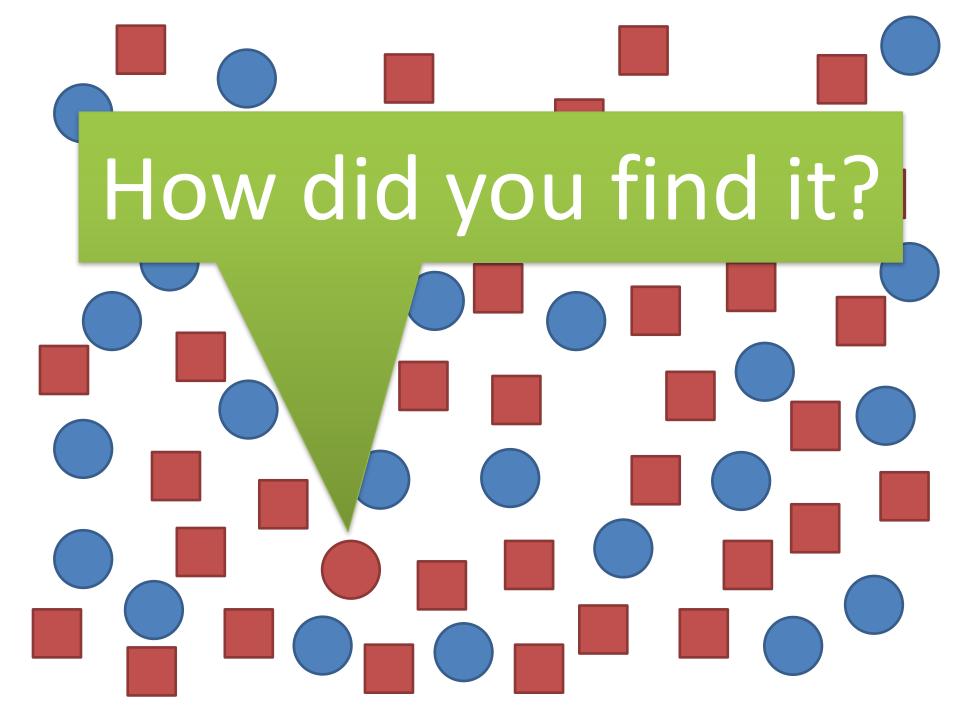




Ah, interesting, so a unique visual property in the target allows it to "pop out" of the display...

Find the red ball...



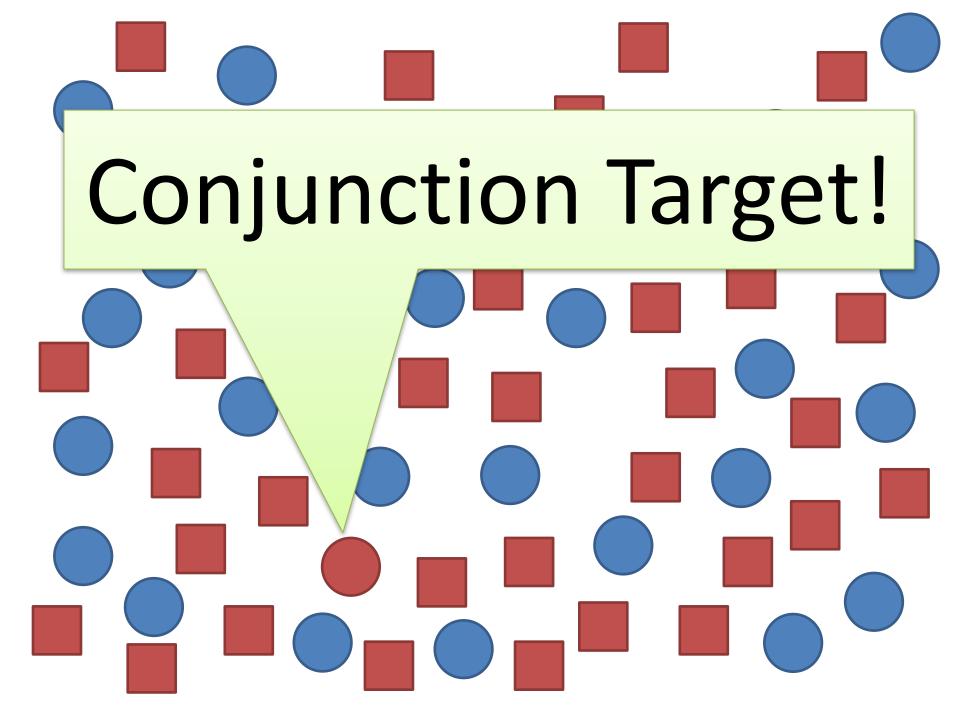


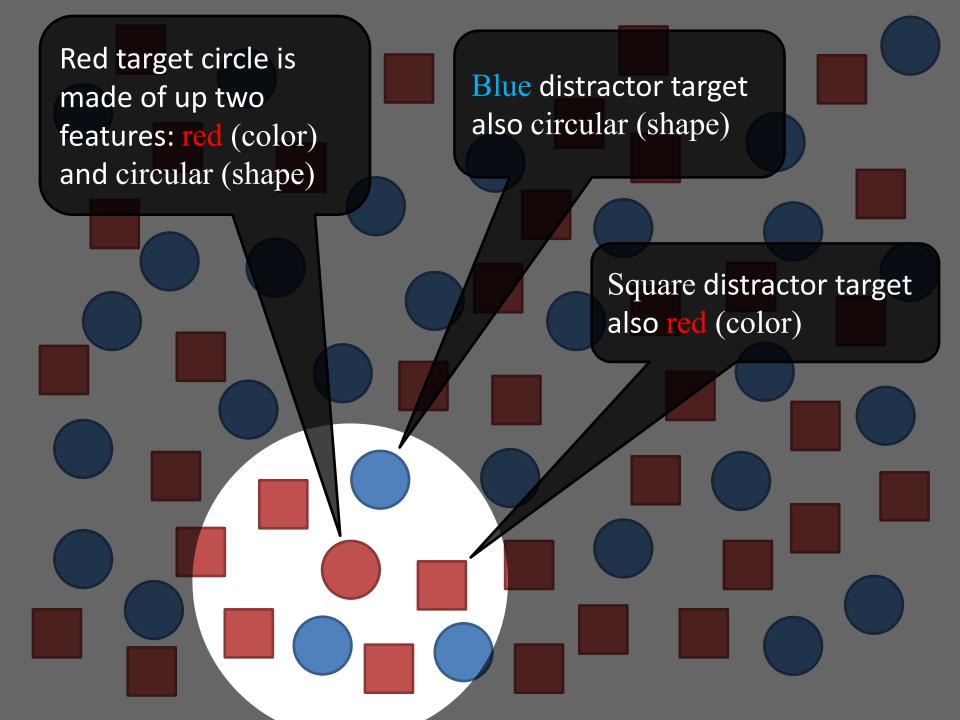
Why didn't this work?

A conjuction target is a target made up of a combination of non-unique features and typically cannot be detected preattentively.



The red circle is made up of two visual features: red and circular. One of these features is present in each of the distractor objects (red squares, blue circles)

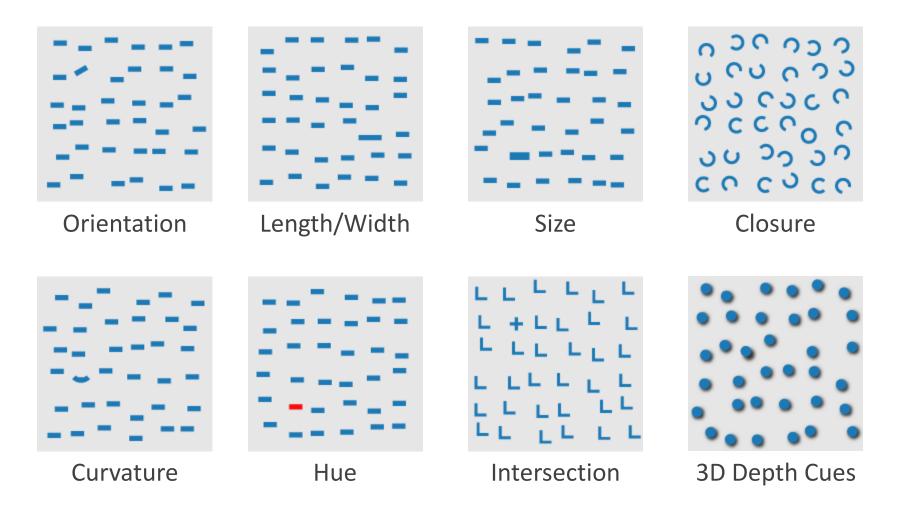




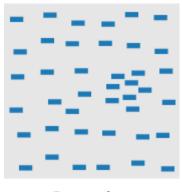


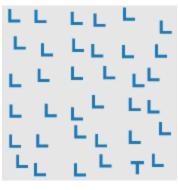
Numerous studies have shown that this target cannot be detected preattentively. Instead, viewers must perform a time-consuming serial search to confirm the presence or absence of the red circle.

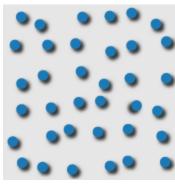
Preattentive (Static) Visual Features



Preattentive (Static) Visual Features





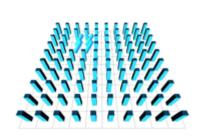


Density

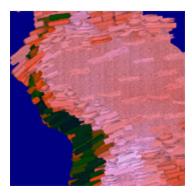
Number, Estimation

Terminators

Lighting Direction



3D Orientation



Artistic Properties