



Perceptual Organization and Visual Design

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January 20, 2003



Outline

- Perceptual Organization: Theory
- Gestalt Laws
- Transparency
- Summary



Perceptual Organization

- How all the bits and pieces of visual information are structured into the larger units of perceived objects and their interrelations
- Objects are extracted from patterns of features

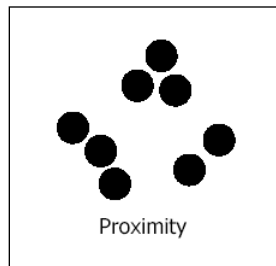


Perceptual Organization

- Early feature abstraction stages
 - Primitive elements—visual image analysis
 - Parallel processing of the entire image
- 2D pattern perception stage
 - Contours—visual image into regions
 - Structures—connections between parts
 - Serial processing of smaller amount of objects

Proximity

- Things that are close together are perceived as grouped together



Proximity

- It is hard to find things if they are not spatially grouped

LIBRARY OF CONGRESS HELP & FAQ's

General Information About the Library

- | | |
|---------------------------------------|--|
| - The Library's Mission | - General Public Hours |
| - A History of the Library | - A Tours & Visitor Information |
| - LC Associates Program | - Reading Room Hours |
| - Recorded Information Numbers | - Library Maps & Floor Plans |
| - Library Publications | - Travel, Lodging & Dining |
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| - Staff Online Directory | - About Our Site |
| - Current Job Opportunity | - CILIC Web Style Guide |
| - CILIC Job Opportunities | - Usage Statistics |
| - Junior Fellows Program | - CILIC Web Appraisal |
| - LIL Russian Leadership Program | |
| - CILIC-Soros Visiting Fellow Program | |



Proximity

- Better Design

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Proximity

- Even better design

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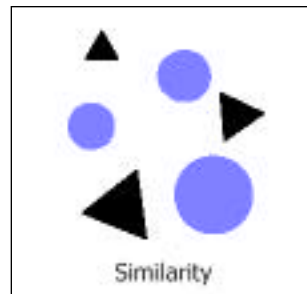
Proximity

- Study shows that labelled visual hierarchies can be searched much more efficiently than unlabelled visual hierarchies

<Visual Search and Mouse-Pointing in Labelled versus Unlabelled Two-Dimensional Visual Hierarchies, HORNOF, TOCHI 8(3), 2001>

Similarity

- Similar elements tend to be grouped together
 - Colour
 - Size
 - Orientation



Similarity

- When displays are the same, make them look the **same**
- When displays are different, make them look **different**

Similarity

- Microsoft Calculator (Windows 2000)
- Which are the **operators** (+, -, x, sqrt, %)?
- Which are the **operands** (1, 2, 3...)?



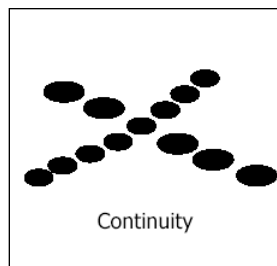
Similarity

- Better design
- Can easily distinguish operators and operands



Continuity

- More likely to perceive visual element as **smooth** and **continuous**, than with abrupt changes



Continuity

- Continuity may be the reason behind the rule of **alignment**
 - Alignment refers to items on a page being lined up with each other
 - Effective alignment makes multiple lines of text easier to read, and easier to search

Continuity

- Left alignments are usually better

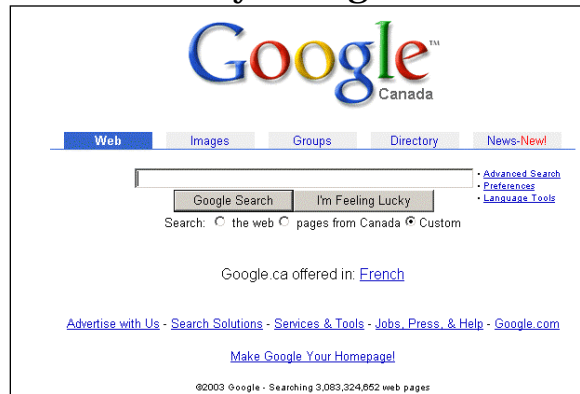


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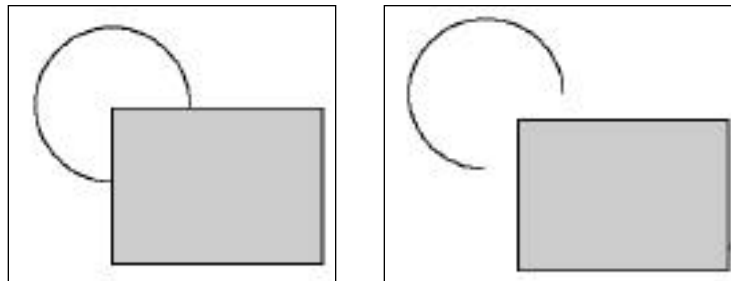
Continuity

- Centred alignment provides visual balance, but is less visually strong



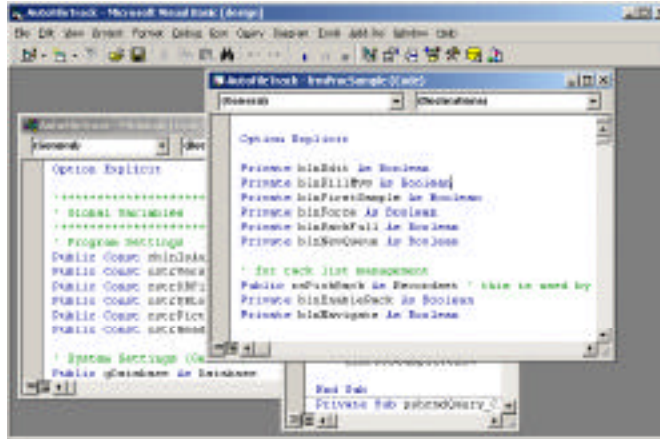
Closure

- Closed contour tends to be seen as an object



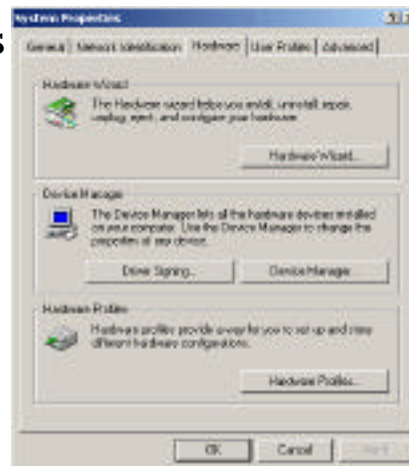
Closure

- Basis for multi-document interfaces



Closure

- Closed contour divides region into “inside” and “outside”
-> works to enhance proximity
- Usually a good idea to group related displays using frames



Figure/Ground

- Due to all Gestalt laws, and textual segmentation
- Vase or Faces?



Figure/Ground

- Effectiveness depends on
 - Surroundedness
 - Orientation
 - Size

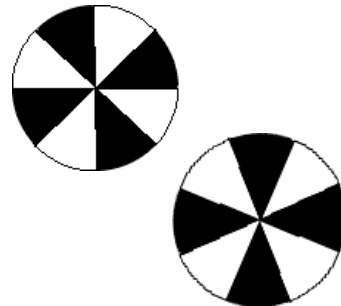


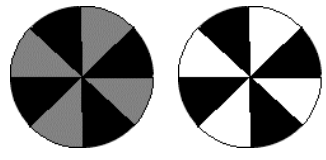
Figure Ground

- Effectiveness depends (cont'd):

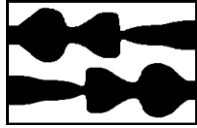
- Concavity



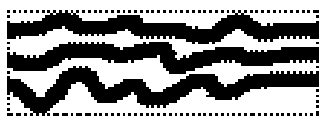
- Contrast



- Symmetry

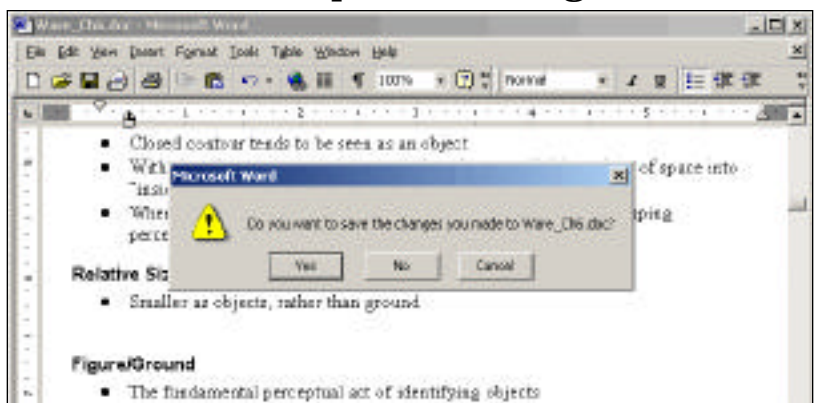


- Parallelism



Figure/Ground

- More attention paid to dialog boxes



Figure/Ground

- In small screen displays, things may not be that obvious...
 - Surroundedness
 - Size
 - Contrast



Pocket PC 2000

Figure/Ground

- Guideline for Pocket PC 2002: Minimize the use of floating dialog boxes



Pocket PC 2000



Pocket PC 2002

Figure/Ground

- Text or picture?
 - The “Hallmark moments” in web page design...



Perception of Transparency: Overlapping Data

- One layer over another
- Problems
 - Interference between the overlapped layers
 - Fusion of layers—which is which?
- Requires
 - Good continuity
 - Adequate contrast

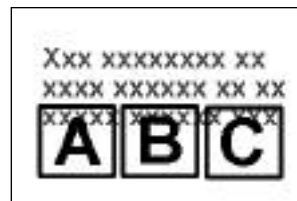
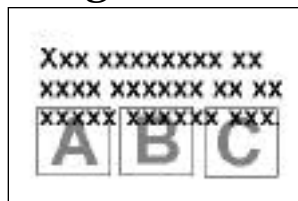


Transparency

- Innovative way to overcome screen size constraint in small devices?
 - Visual design in small devices
 - Small screen size: 6cm x 6cm
 - Low resolution: 1/15 – 1/10 of desktop
- > Cannot display a lot of information

Transparency

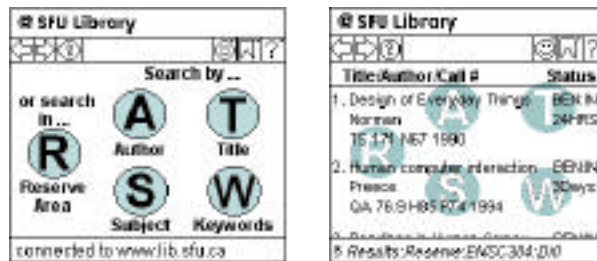
- Transparency can use screen real estate more effectively
- E.g.: Overlapping semi-transparent “widgets” and text



<Using Small Screen Space More Efficiently, KAMBA, CHI 96>

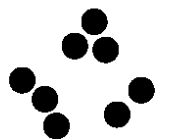
Transparency

- Applying the idea of semi-transparent “widgets” to a small-device online library catalogue



Summary

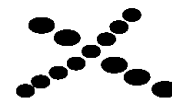
- Gestalt Laws are very useful in visual design



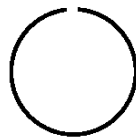
Proximity
Grouping
Visual Search



Similarity
Functional association



Continuity
Alignment



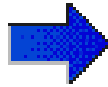
Closure
MDI, Grouping



Figure/Ground
Readability, Attention

Summary

- Insights in perception organization may lead to innovative ways in visual design



SFU Library	
Title/Author/Call #	Status
1. Design of Everyday Things Norman TS 371 N67 1990	BEN IN 24HRS
2. Human computer interaction Proccs QA 76.9 H85 P74 1994	BEN IN 30days

5 Results/Reveal: ENSC304:DW