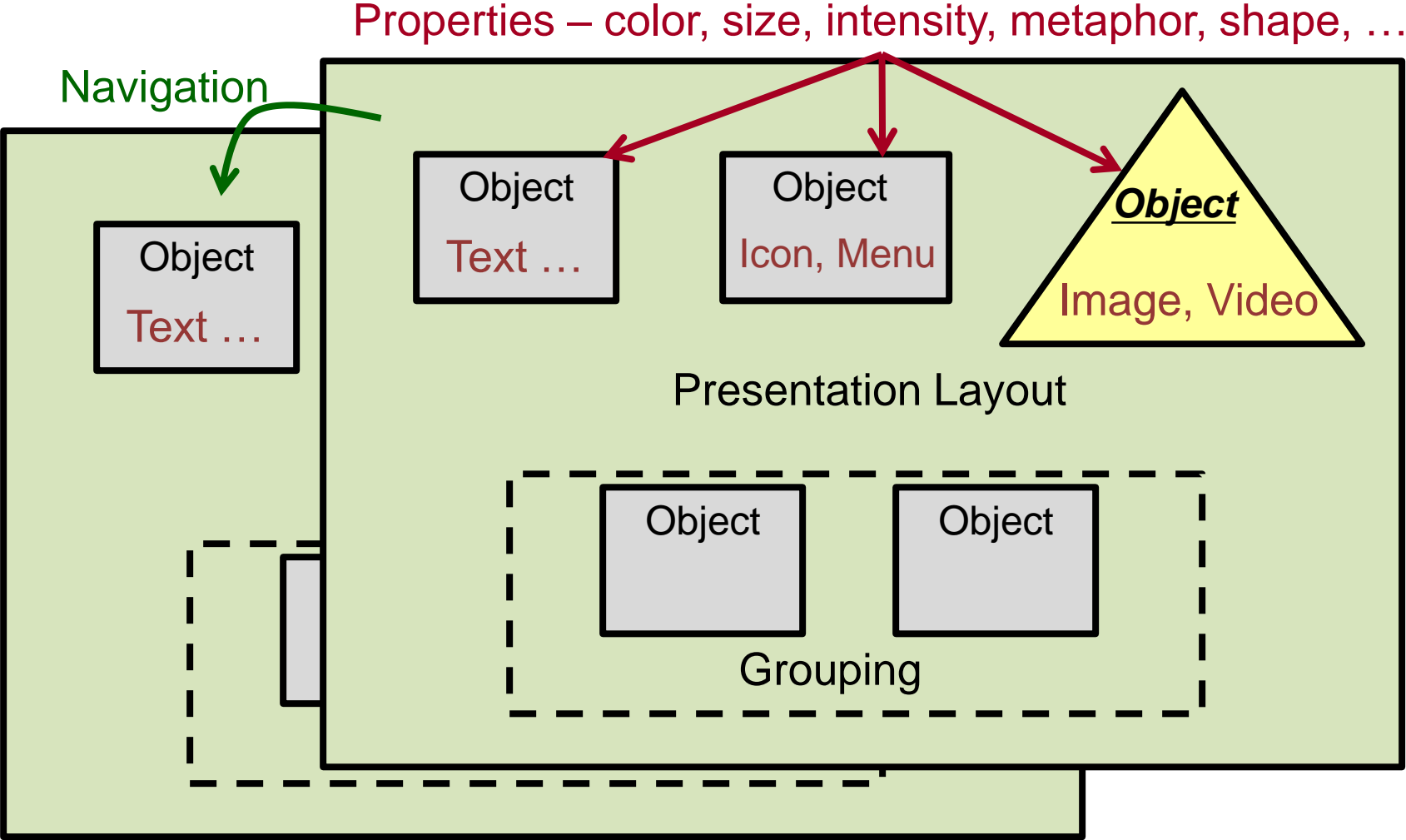


Presentation Design Principles

Grouping, Contrast, Proportion

SWEN-444

Usability Presentation Design Framework



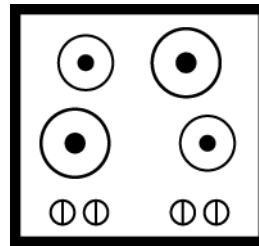
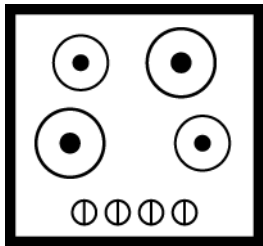
Presentation Simplicity

- **Remove** whatever **isn't essential**
- Use a **regular pattern** for elements, limit variation – same font, color, size, ...
- **Combine** element **roles** – e.g., label as a link (affordances?)
- **Balance, symmetry, alignment**
- **White space**
 - Provide white space **margins** around objects to avoid crowding
 - Crowding impacts scanning
 - **Balance** with need to use **screen real estate**

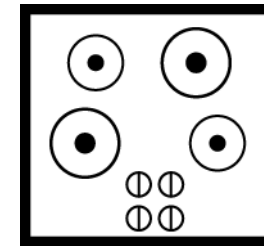
Mapping

- Mapping describes how we **make connections between things**; patterns

Proper mapping can increase the usability of an interface



Stove Top

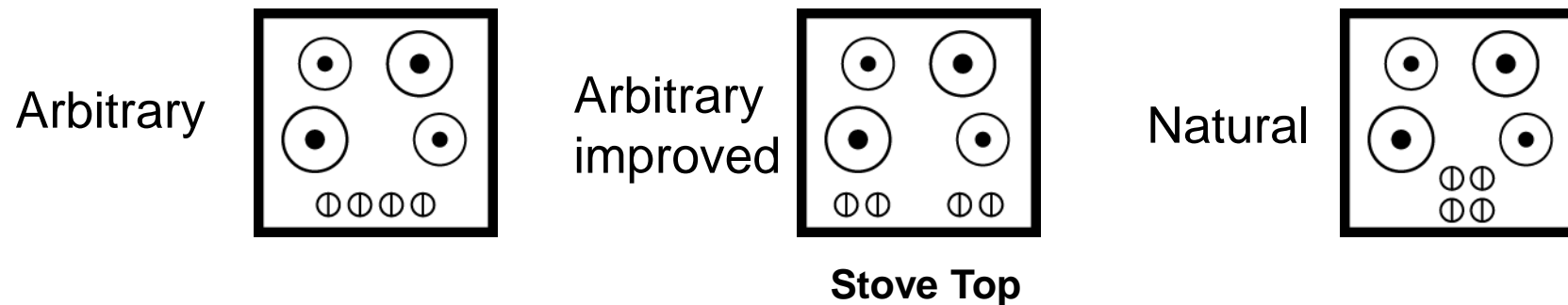


What is the best mapping of the controls?

Mapping

- Mapping describes how we **make connections between things**; patterns

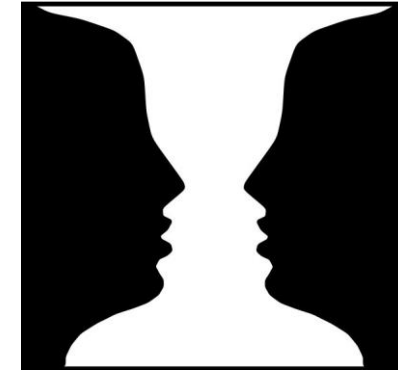
Proper mapping can increase the usability of an interface



Use natural mapping whenever possible

Grouping: Gestalt Principles of Perception

- Gestalt psychology strives to explain the factors involved in **the way we group things** :-)
 - **Perception of the environment as whole entities** even without complete information
 - Distinguish **foreground** objects from **background**
 - The viewer looks for the **simplest solutions** even when visually information is incomplete



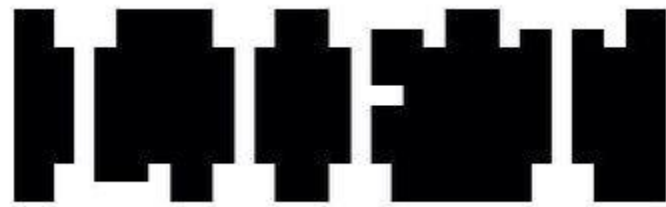
The Rubin
Face/Vase
Illusion

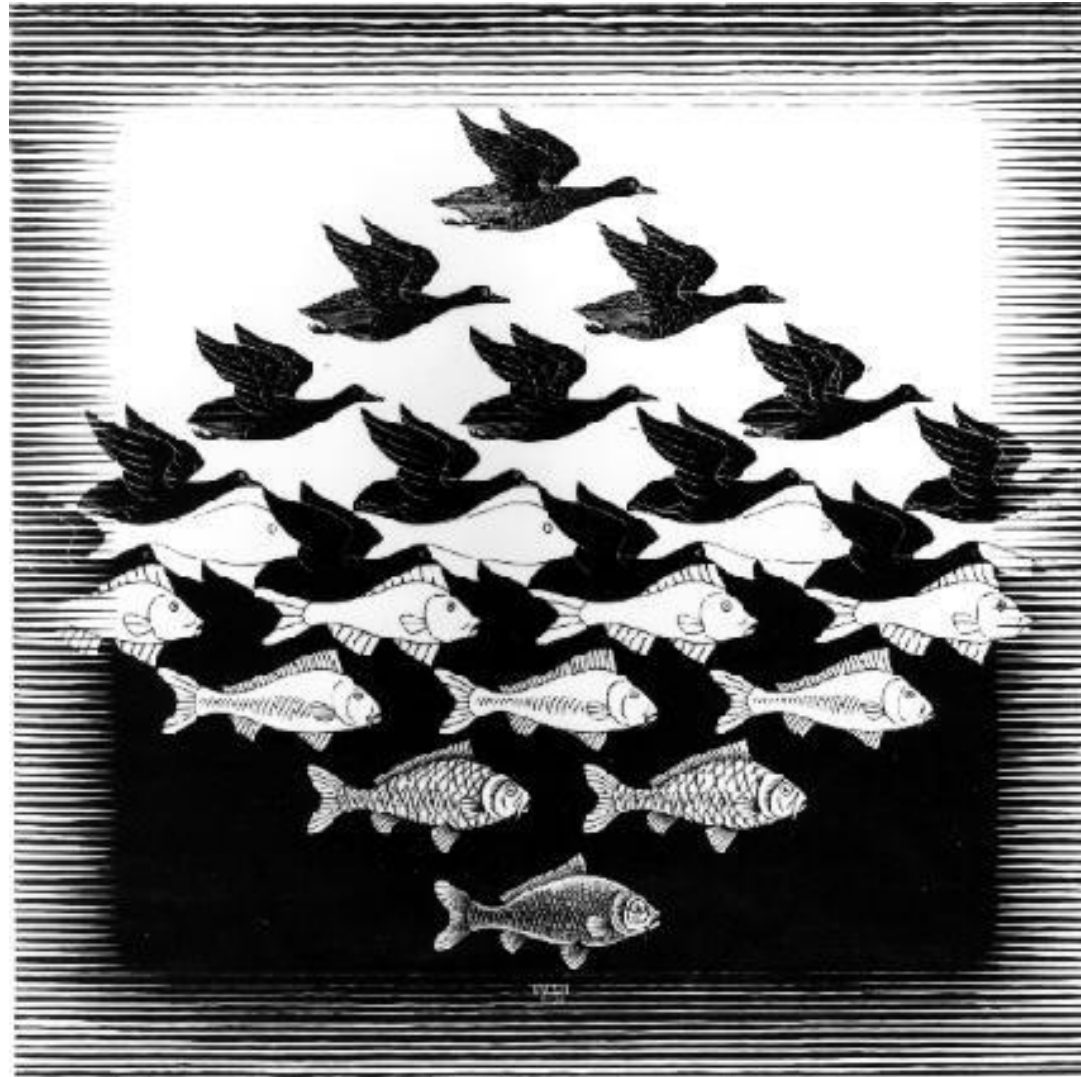
“Gestalt psychology tries to understand the laws of our ability to acquire and maintain meaningful perceptions in an apparently chaotic world. The central principle of gestalt psychology is that the mind forms a global whole with self-organizing tendencies.” Wikipedia



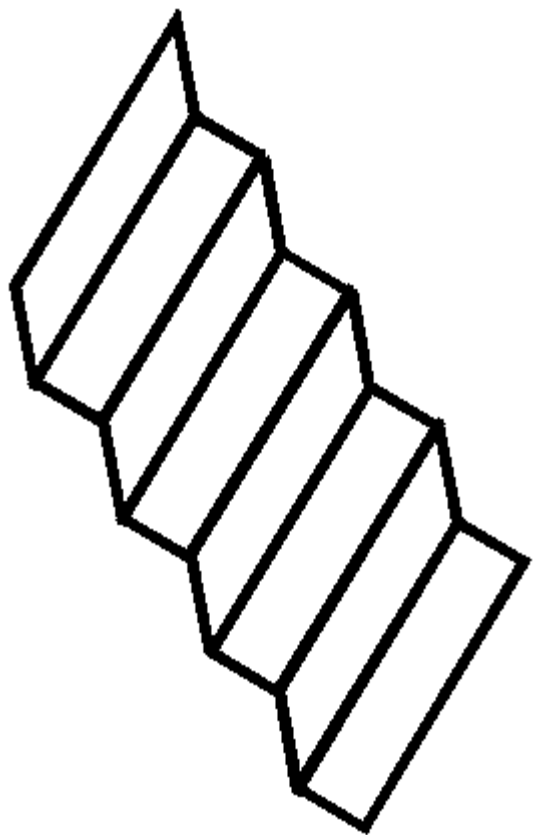
FIGURE 15.

Gödel Escher Bach: An Eternal Golden Braid

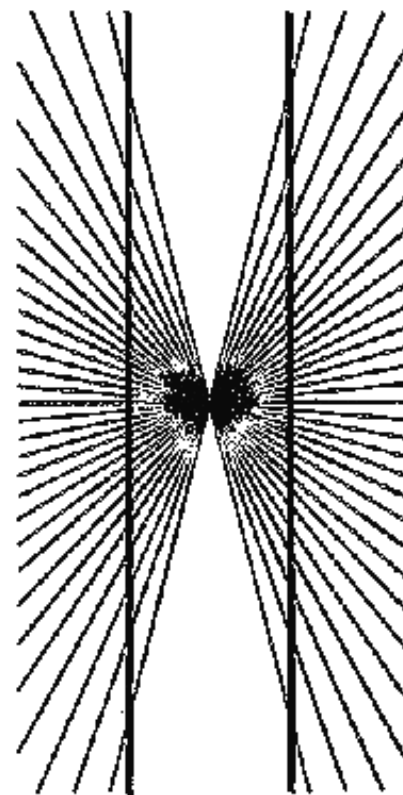




M. C. Escher (1898-1972)

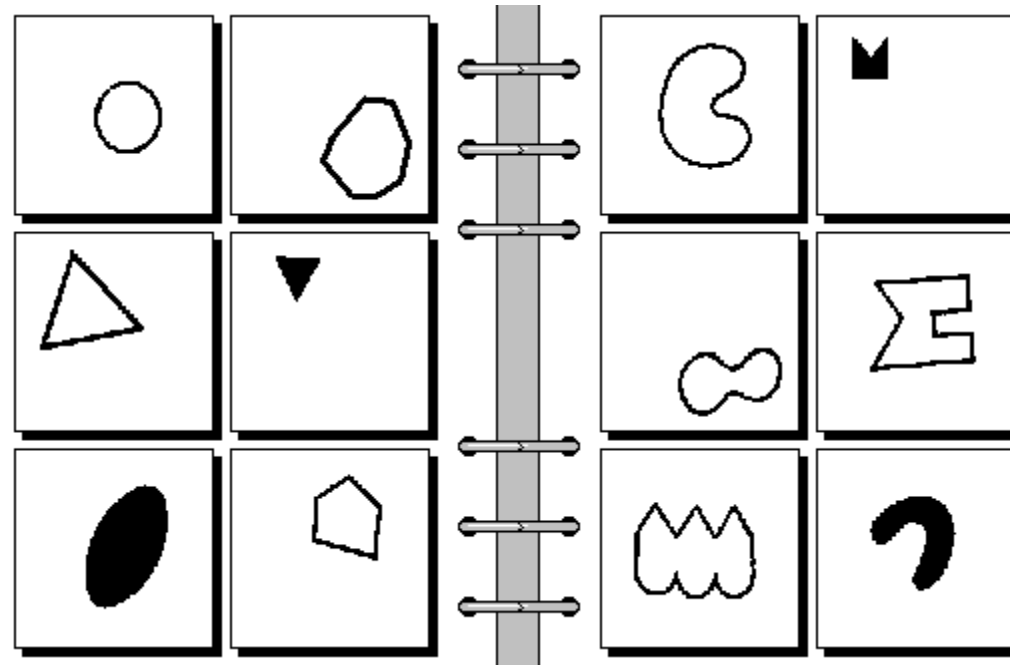


Reversing Staircase



Hering Illusion

Bongard Problems



What are the pattern rule differences between the left and right columns?

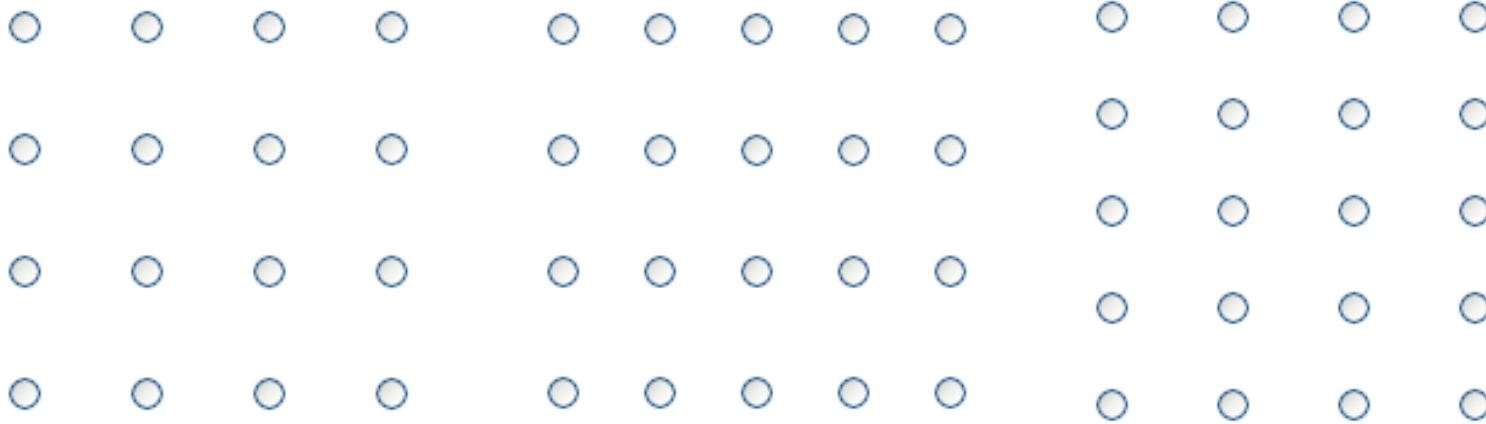
A Bongard problem is a kind of puzzle invented by the Russian computer scientist Mikhail Moiseevich Bongard, probably in the mid-1960s.

Grouping

- Gestalt perception principles are useful to guide the placement and organization of screen elements; e.g., icons, structure menu items
 - Proximity
 - Similarity
 - Common Fate
 - Closure
 - Good Continuity
 - Area
 - Symmetry
 - Surroundedness
 - Prägnanz

Gestalt Principles of Perception

- **Proximity Principle** – Objects that are **close** to each other will be seen as **belonging together**



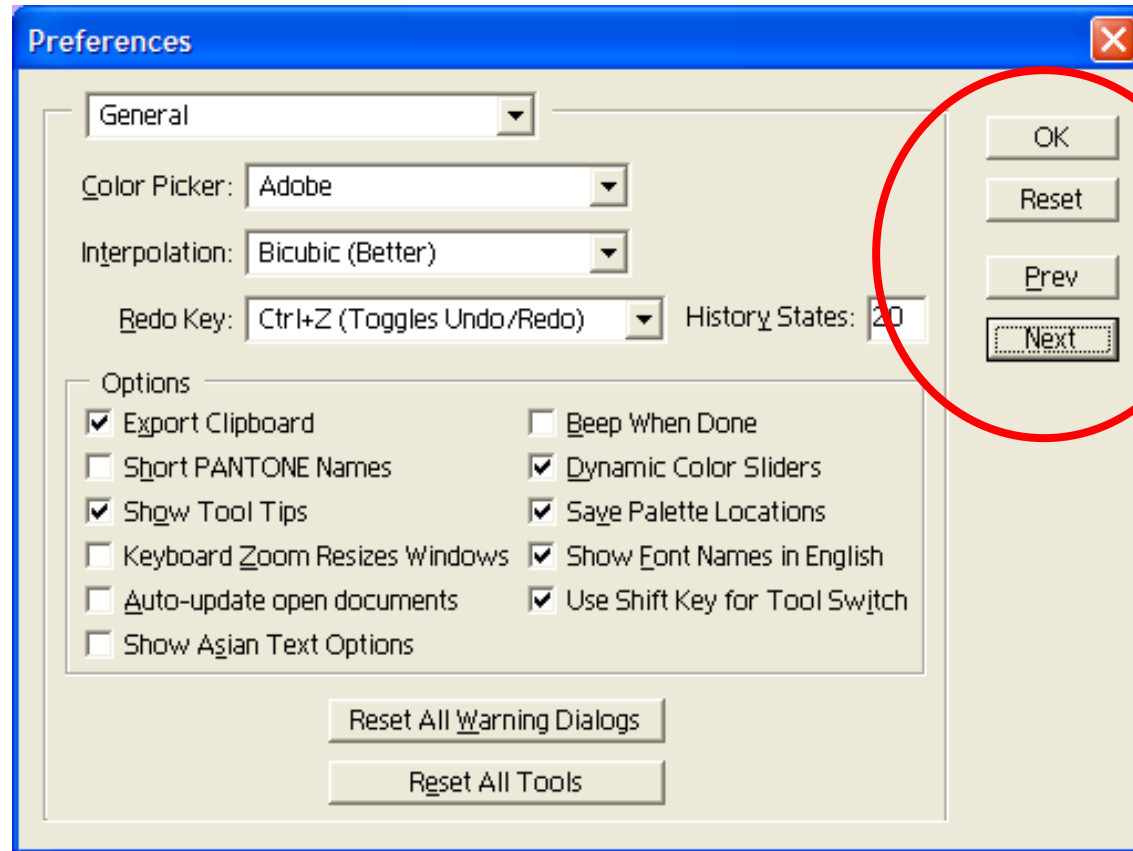
Equidistant

Horizontal Proximity

Vertical Proximity

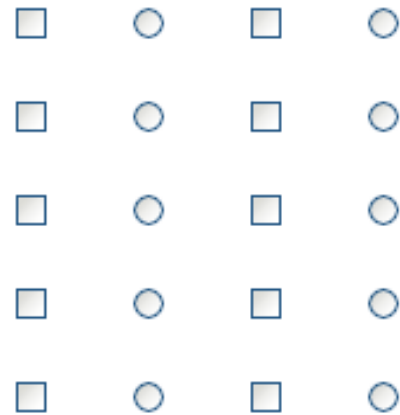
Gestalt Principles of Perception

- **Proximity** - Adobe PhotoShop Preferences Dialog



Gestalt Principles of Perception

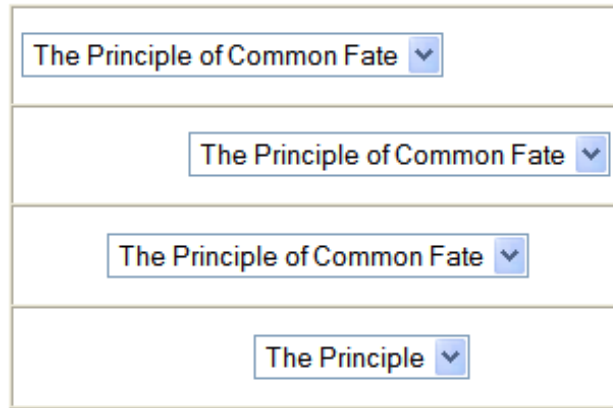
- **Similarity Principle** – Objects that have **similar visual characteristics**, such as size, shape or color will be **seen as a group** and therefore related



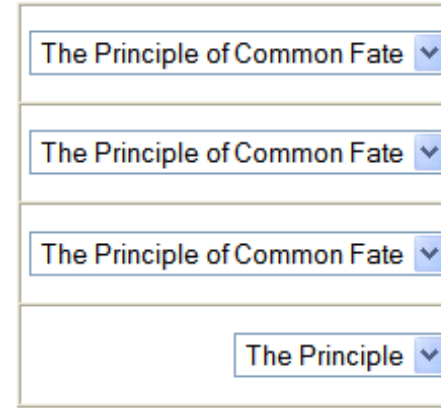
Columns of Similar Objects

Gestalt Principles of Perception

- **Common Fate Principle** – Objects that **move together** (beginning, direction, end) are seen as **related**



Unaligned Drop-Down Menus



Aligned Drop-Down Menus

OXOOXOXXXOO
(Similarity)

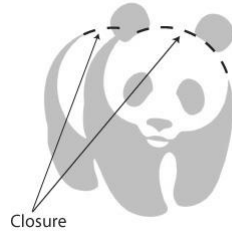
↑
O O X XX O
↓
X O OX O
(Common fate)

Common Fate Metaphor

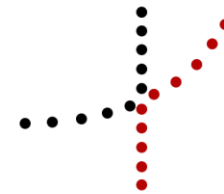
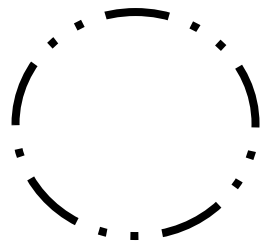


Gestalt Principles of Perception

- **Closure Principle** – We tend to **see things as complete** objects even though there may be gaps in their shape



- **Good Continuity Principle** – We tend to see things as **smooth, continuous representations; e.g.**, tendency to perceive a line continuing its established direction



Gestalt Principles of Perception

- **The Area Principle** – Objects with **small area** tend to be **seen as the figure, not the (back)ground** (also called the smallness principle)



Gestalt Principles of Perception

- **Surroundedness Principle** – An area that is **surrounded** will be seen as the **figure** and the **area that surrounds** will be seen as the **ground**

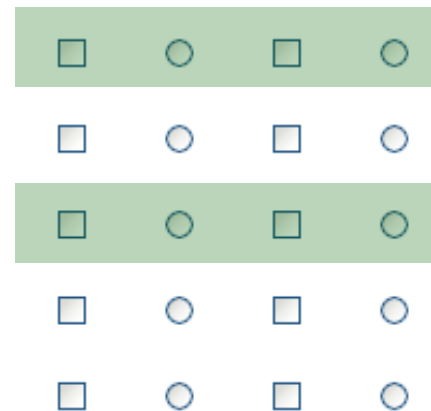


Gestalt Principles of Perception

- **Prägnanz Principle** – we tend to **order** our **experience** in a manner that is **regular, orderly, symmetric, and simple**

–An **overarching principle** evolved from the combination and interaction of the other principles

–Avoid conflicts of principles



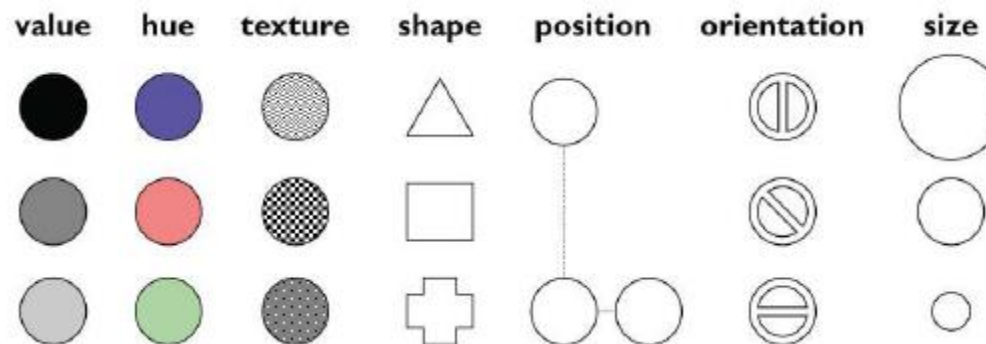
Similarity vs. common
fate or
surroundedness
perception

Contrast

- **Visual stimulus via contrast** – we perceive **visual differences** of an object **before** its meaning

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

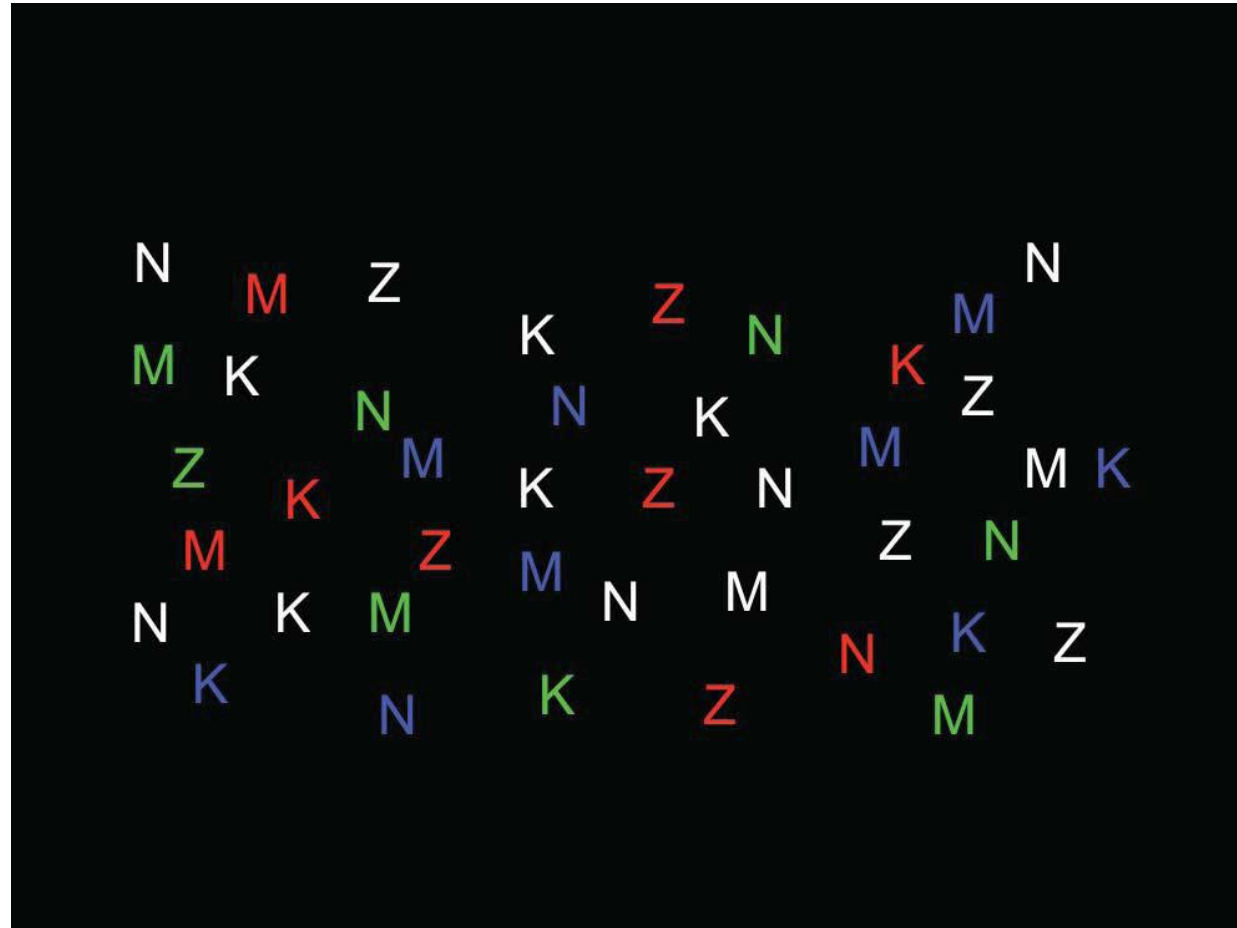
- **Visual variables** – visual dimensions of perception
 - Selective – **single value** of the variable can be **distinguished** in the visual field – **locate at a glance**



Bertin, *Graphics and Graphics Information Processing*, 1989

Contrast

- Find all letters on the left
- Find all red letters
- Find all K's
- Easiest, hardest?



Contrast in Design

- Choose **appropriate** visual variables
- Use **as much range as possible** (e.g., small to large)
- Variable **values** that make distinctions **obvious**
- **Multiple variable reinforcement**; e.g., bold and color
- Use the squint test

Proportion

- **Proportion** – relative size

- E.g. – heading element hierarchy (this slide!)

- Golden ratio** – found in nature, pleasing visual proportions

$$\phi = 1.618$$

