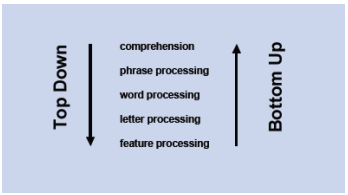
Top-Down Processing

THE MAN RAN.

Top versus Bottom



Word Superiority Effect

WORK

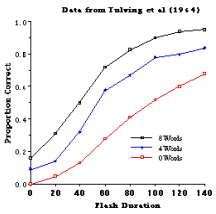
K

C/K

C/K

Sentence Superiority Effect

- Tulving, Mandler, and Baumal
- Disorder (red)
- Filled with dirt and disorder (blue)
- The huge slum was filled with dirt and disorder (black)
- Dependent Variable is Proportion Correct
  - Higher on graph means better performance



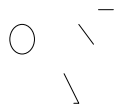
Phoneme Restoration Effect

The state governors met with their respective legi*latures convening in the capital city.

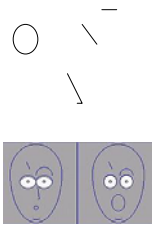
Warren & Warren (1970)

- It was found that the *eel was on the axle.
- It was found that the *eel was on the shoe.
- It was found that the *eel was on the orange.
- It was found that the *eel was on the table.

Facial Features & Context



Facial Features & Context

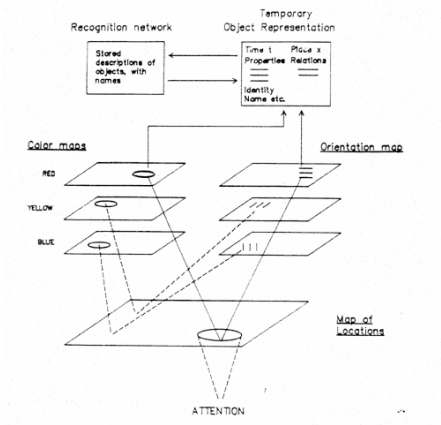


Feature Integration Theory: Basics Treisman (1988, 1993)

- Attention used to bind features together
- Code 1 object at a time based on location
- Bind together whatever features are attended at that location

FIT: Details

- Sensory “features” (color, size, orientation etc) coded in parallel by specialized modules
- Modules form two kinds of “maps”
  - Feature maps
    - Color maps, Orientation maps, etc.
  - Master map of locations



Feature Maps

- Contain 2 kinds of info
  - Presence of a feature anywhere in the field
    - There’s something red out there…
  - Implicit spatial info about the feature
- Activity in feature maps can tell us what’s out there
- Can’t tell us:
  - Where it is located
  - What other features the red thing has

Master Map of Locations

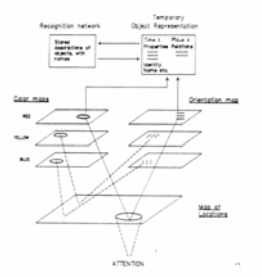
- Codes where features are located, but not which features are located where

More FIT Details

- Need some way of:
  - Locating features
  - Binding appropriate features together
- [Enter Focal Attention]

Role Attention in FIT

- Attention moves within the location map
- Selects whatever features are linked to that location
- Features of other objects are excluded
- Attended features are then entered into the current temporary object representation



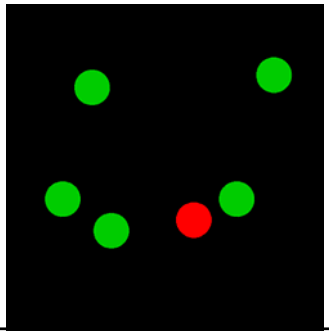
Feature Integration Theory

- Distinction btw objects and features
- Pre-attentional, parallel processing of features
- Serial process of feature integration
- Focused attention is “glue”

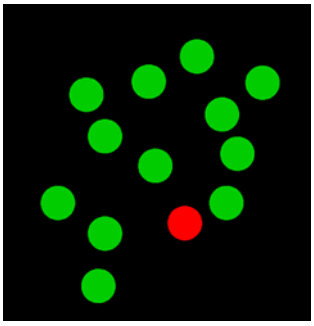
Evidence for FIT

- Visual Search Tasks
- Illusory Conjunctions

Feature Search: Find red dot



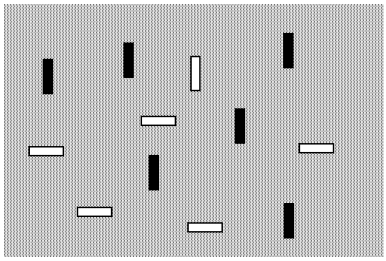
“Pop-Out Effect”



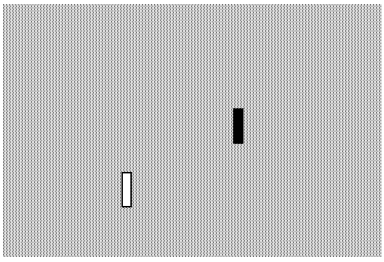
Pop-Out Effect

- In a visual search task, the pop-out effect is the finding that a feature search task (searching for an item that differs from its distracters by a single feature) takes the same amount of time regardless of the number of distracters
- Called the pop-out effect because the target seems to pop out of the array

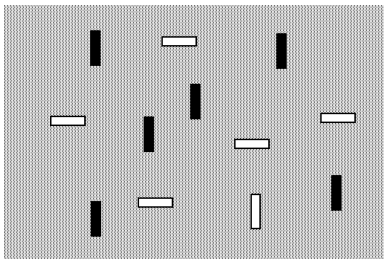
Conjunction Search



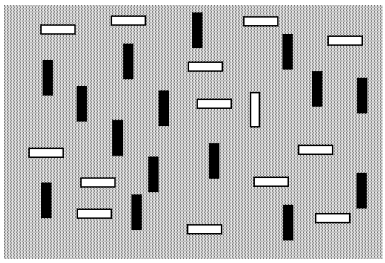
1 Distractor

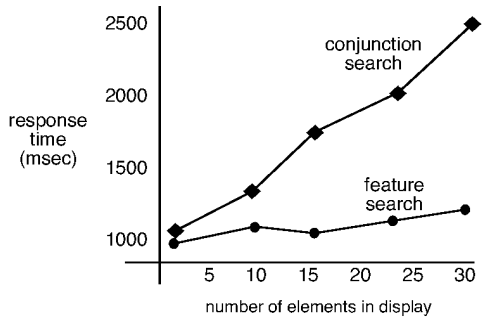


12 Distractors



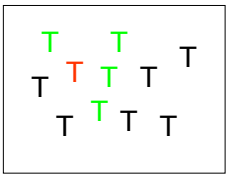
29 Distractors





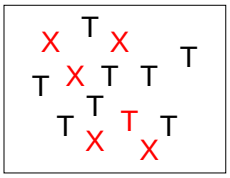
Feature Search

- Is there a red T in the display?
- Target defined by a single feature
- According to FIT this should not demand attention
- Target should "pop out"



Conjunction Search

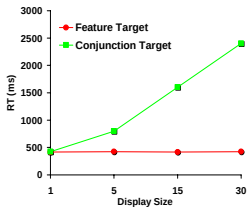
- Is there a red T in the display?
- Target defined by shape and color
- Target detection involves binding features, so demands attention
- Serial search w/focal attention



Visual Search Experiments

- Record time taken to determine whether target is present
- Vary the number of distracters
- FIT predicts that
  - Feature search should be independent of the number of distracters
  - Conjunction search should get slower w/more distracters

Typical Findings



- Feature Targets pop out
  - Flat display size function
- Conjunction Targets demand serial search
  - Non-zero slope

Illusory Conjunctions

- Without focused attention features should be combined at random
  - Illusory Conjunctions

Treisman & Schmidt (1982)

- Two responses required on each trial
  - Report black digits
  - Report color of letters
- Subs sometimes recombine features (~30% of trials)
  - E.g. report seeing a green T or a red O