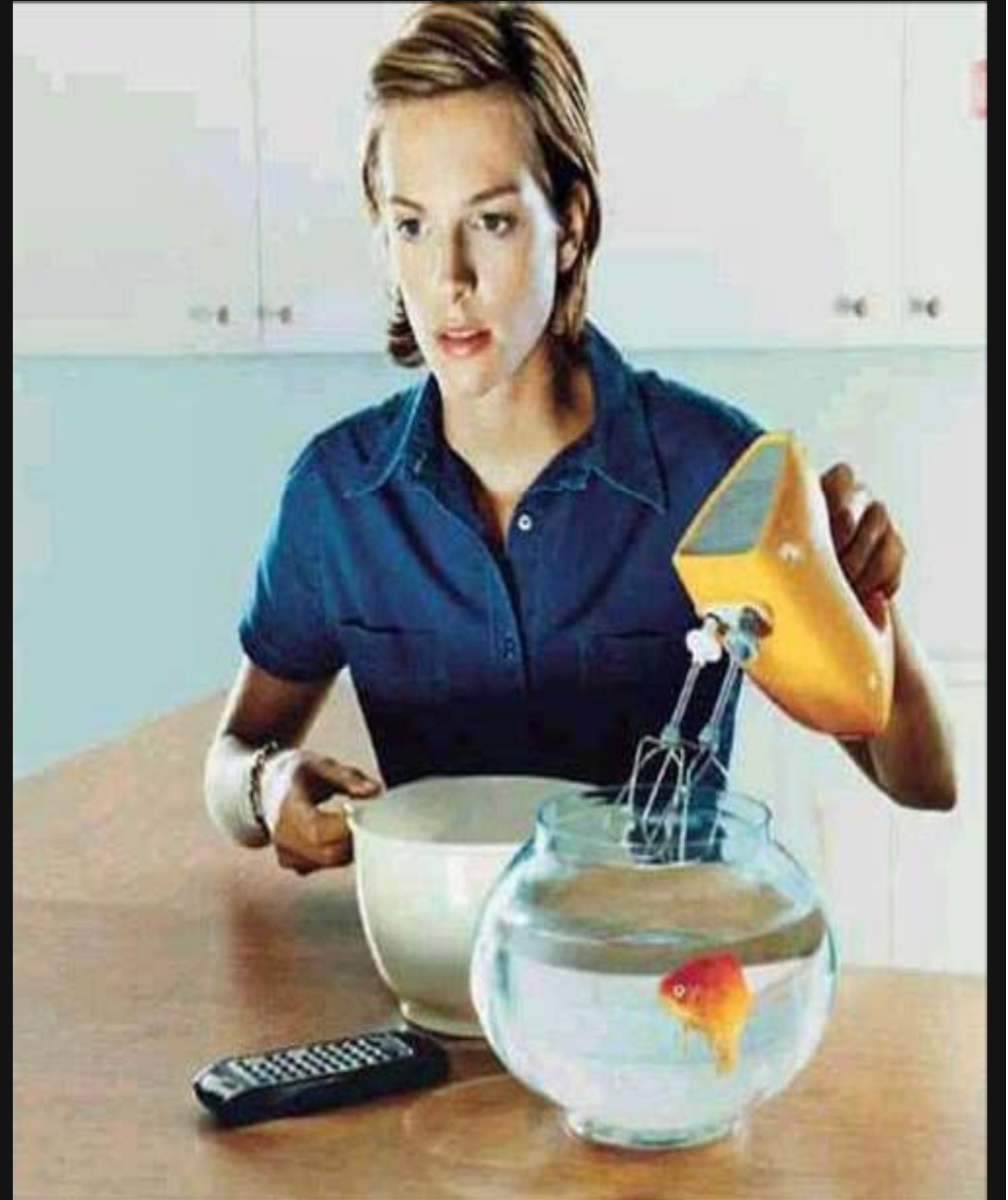
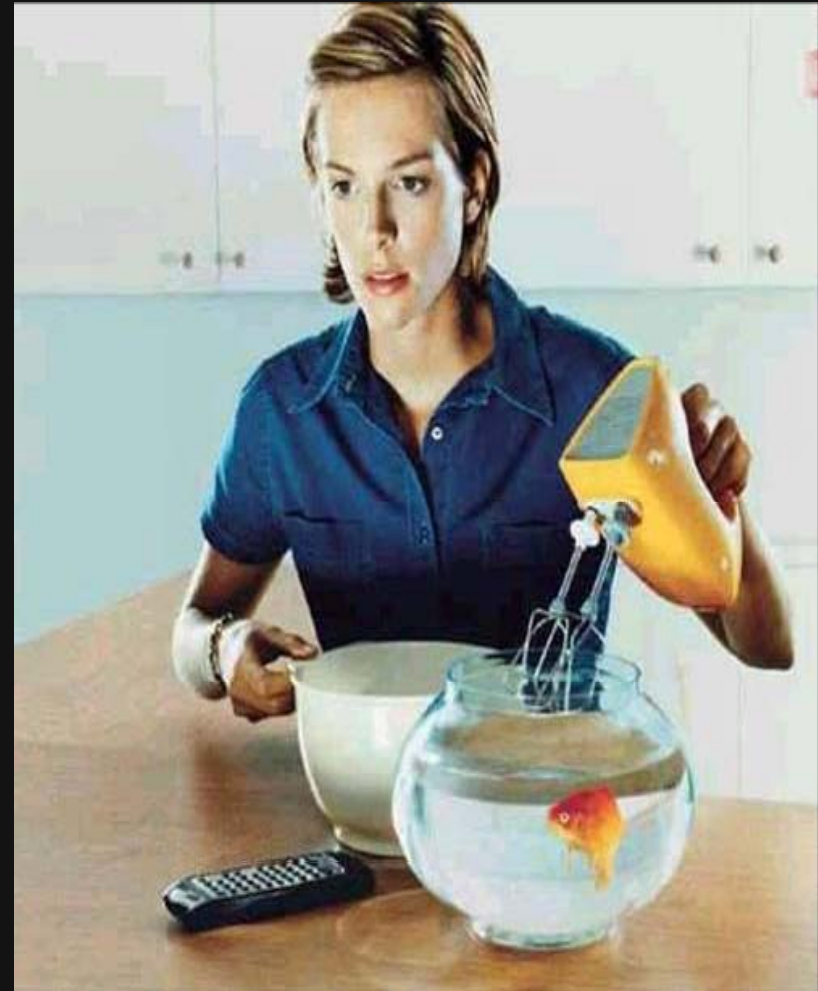


ATTENTION



What is Attention?

- The process whereby a person concentrates on some features of the environment



Divided Attention

When we need to attend to more than one task at once our attention is divided.

Cell Phones & Driving

- Cell phone conversations create inattention blindness for traffic related events/scenes
- Cell phone drivers look but fail to see up to **half** of the information in the driving environment
- Attention plays a critical role in seeing and remembering information in dynamic naturalistic environments

How Significant is the Interference?

➤ Cell-phone vs. drunk-driver

- Redelmeier and Tibshirani (1997) reported epidemiological evidence suggesting that “the relative risk [of being in a traffic accident while using a cell-phone] is similar to the hazard associated with driving with a blood alcohol level at the legal limit” (p. 465).



How Significant is the Interference?

- Compared to drunk driver, cell-phone driver's reactions
 - Slower reaction times
 - Longer to recover lost speed following braking
 - Drivers compensate by increasing following distance
 - Increase in rear-end accidents

Selective Attention

- The ability to maintain alertness to specific stimuli in the environment despite the presence of internal or external distracters.



Selective Attention

- Makes our life easier
- Information is more manageable

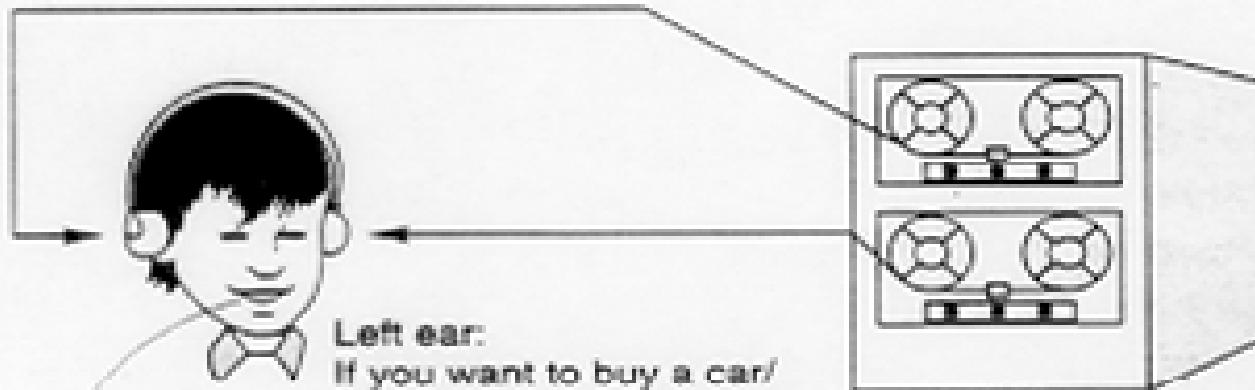


Dichotic Listening

- Listening to two things at once

Right ear:

While Bill was walking through the forest/
a bank can lend you the money.



Left ear:

If you want to buy a car/
a tree fell across his path.

"through the forest, a tree fell—uh..."

Cherry's (1953) Study Results

- Noticed in unattended ear:
 - Change in gender
 - Change to a tone
- Did not notice in unattended ear:
 - Changed language
 - Changed topic, same speaker
 - If speech was played backwards

Cocktail Party Effect

- When engaged in a certain conversation, you can still hear your name from another conversation

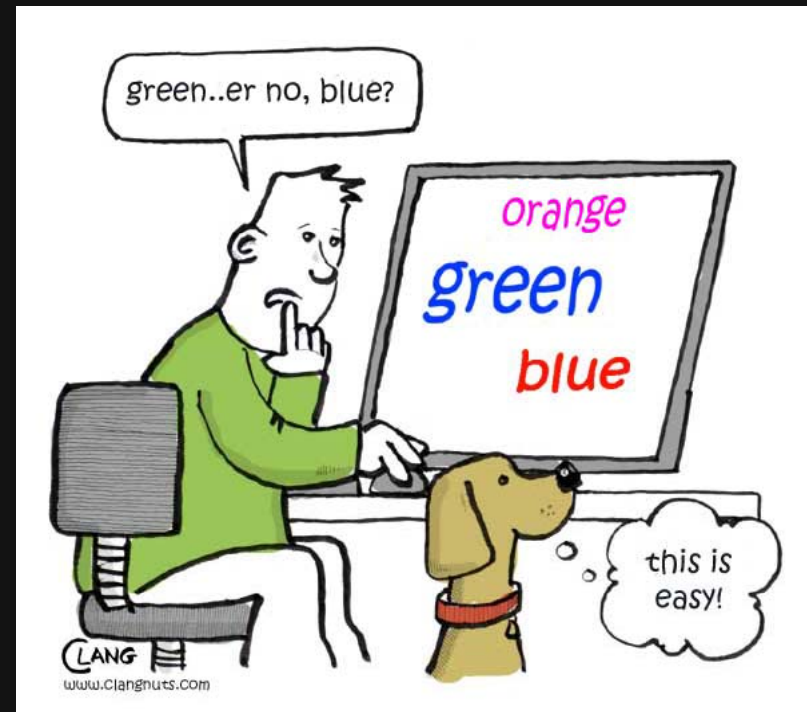


Let's do a quick experiment

- Name the color of the ink

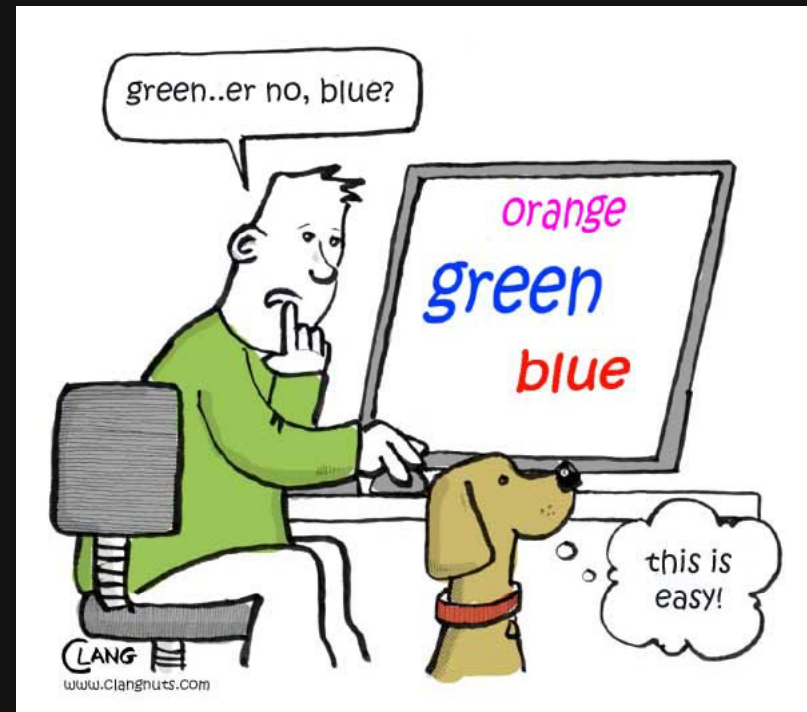
The Stroop Task

- The problem we have in naming the color of the ink, when the word itself names another color.



The Stroop Task

- What is the reason for the Stroop Effect?

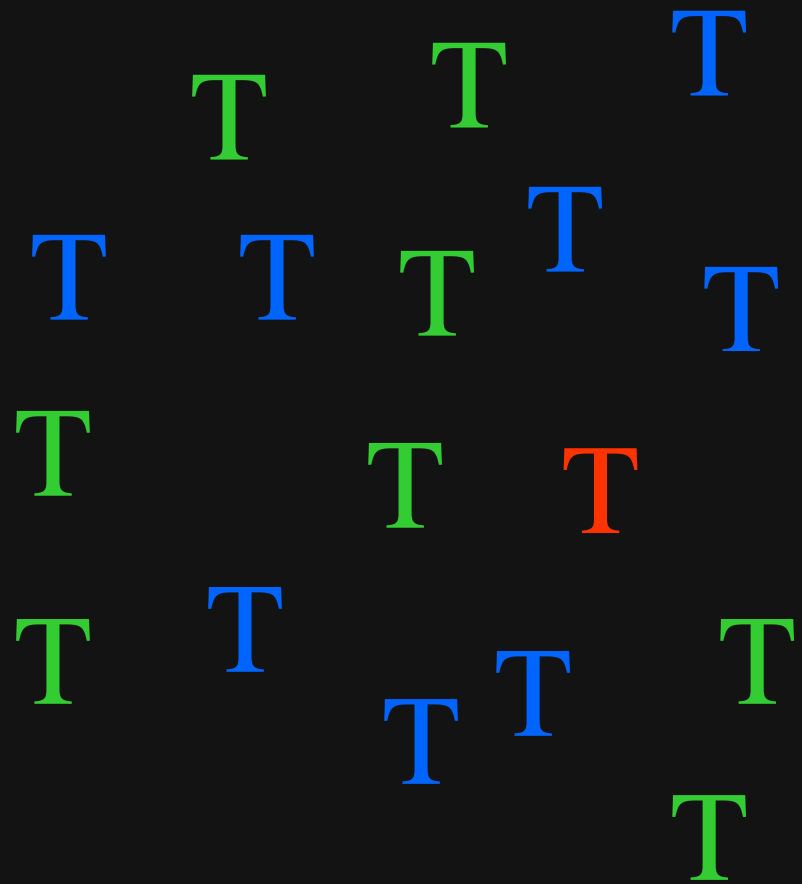


Feature Search

Is there a red T in the Display?

Target is defined by a single feature

No attention required

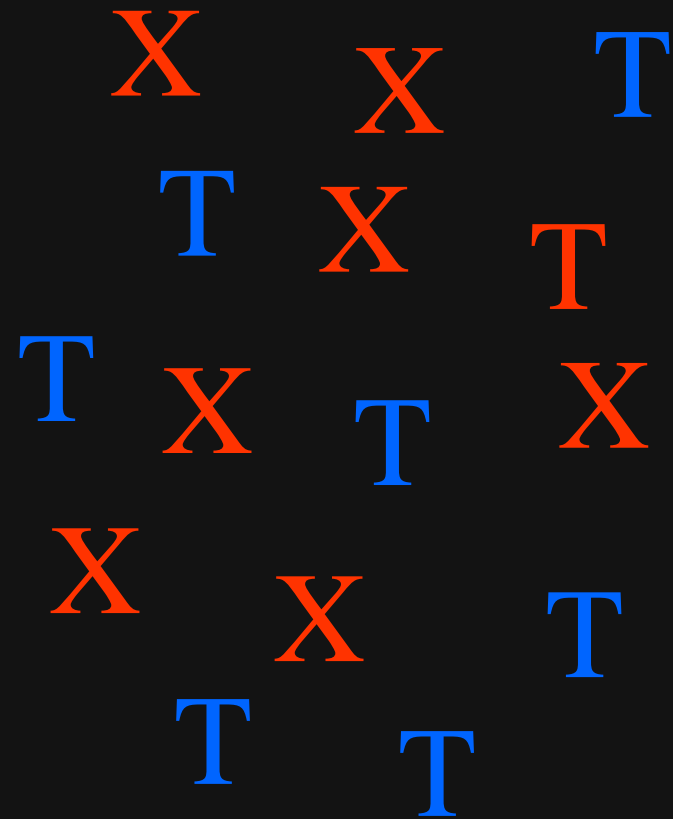


Conjunction Search

Is there a red T in the
Display?

Target is defined by two
Features: shape and color

Need to examine one by one



Present-Absent Effect

- Find the Q

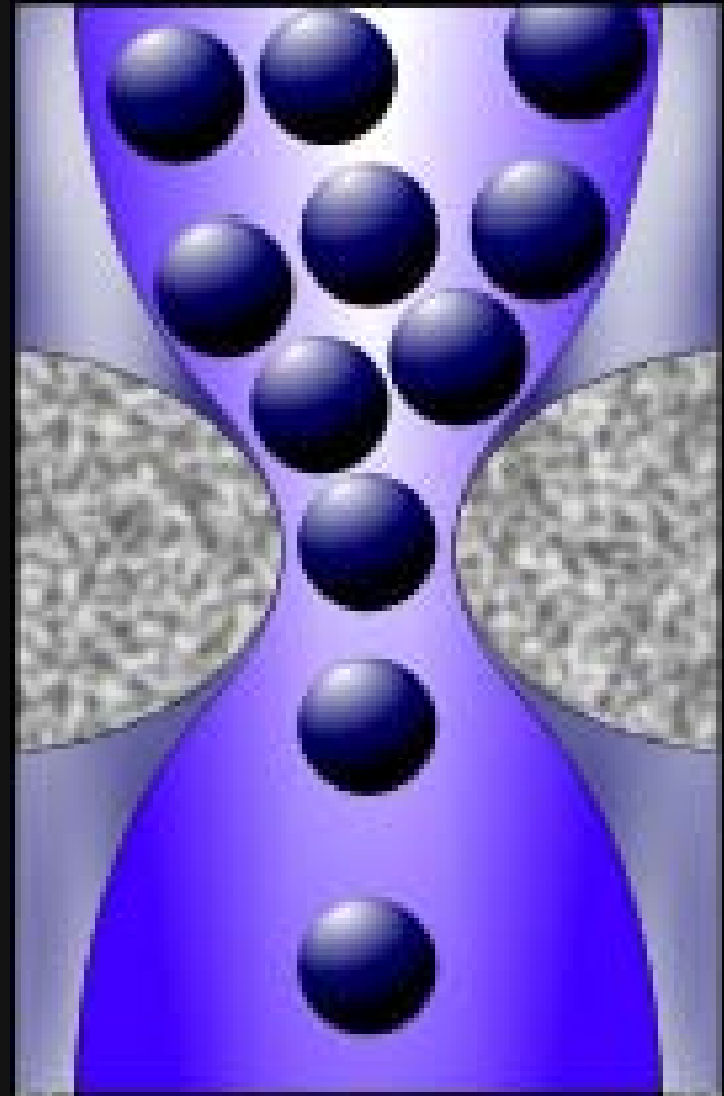
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOQOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

Theories of Attention

- Bottleneck Theory
- Automatic vs. Controlled Processing
- Feature-Integration Theory (FIT)

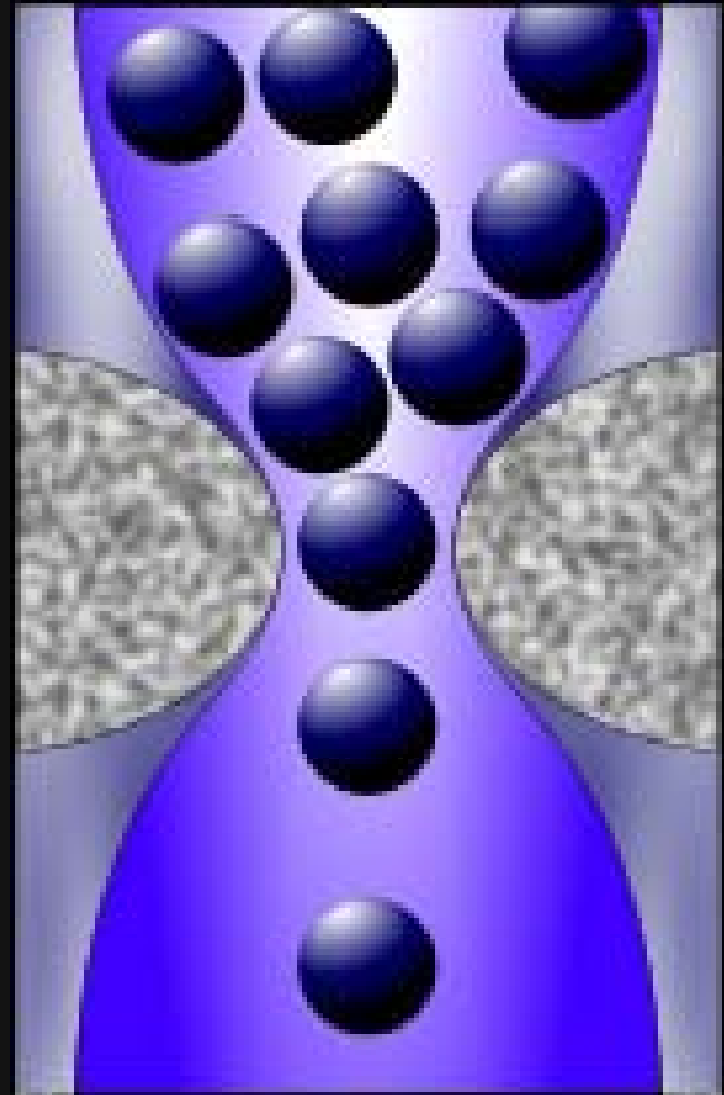
Bottleneck Theory (Broadbent)

- The quantity of information to which we can pay attention to is limited



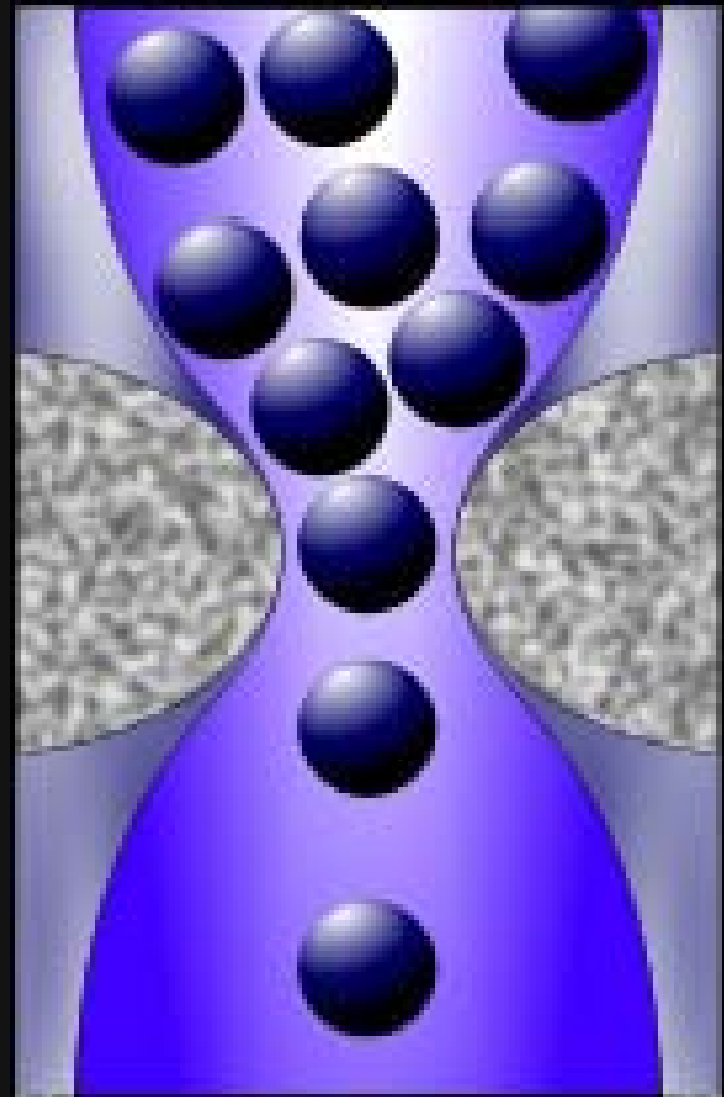
Bottleneck Theory

- A filter
 - The stimulus that is attended to, is let in
 - All other information is rejected.



Bottleneck Theory

- What kind of filter?
 - Peripheral?
 - Blocks out everything not attended, so that you do not even hear them.
 - More central?
 - Not attended stimuli still get some kind of primitive processing.



Evidence from Dichotic Listening

- **Moray:**
 - Played the same word over and over again to the unattended ear
 - **NOT** detected, unless
 - It was your name
 - It was an exclamation remark

Evidence from Dichotic Listening

- **Treisman:**
 - A story is played to the attended ear
 - Sometime the story jumps to the other ear.
 - Subjects also jump while shadowing

Indicates preliminary analysis of semantic information

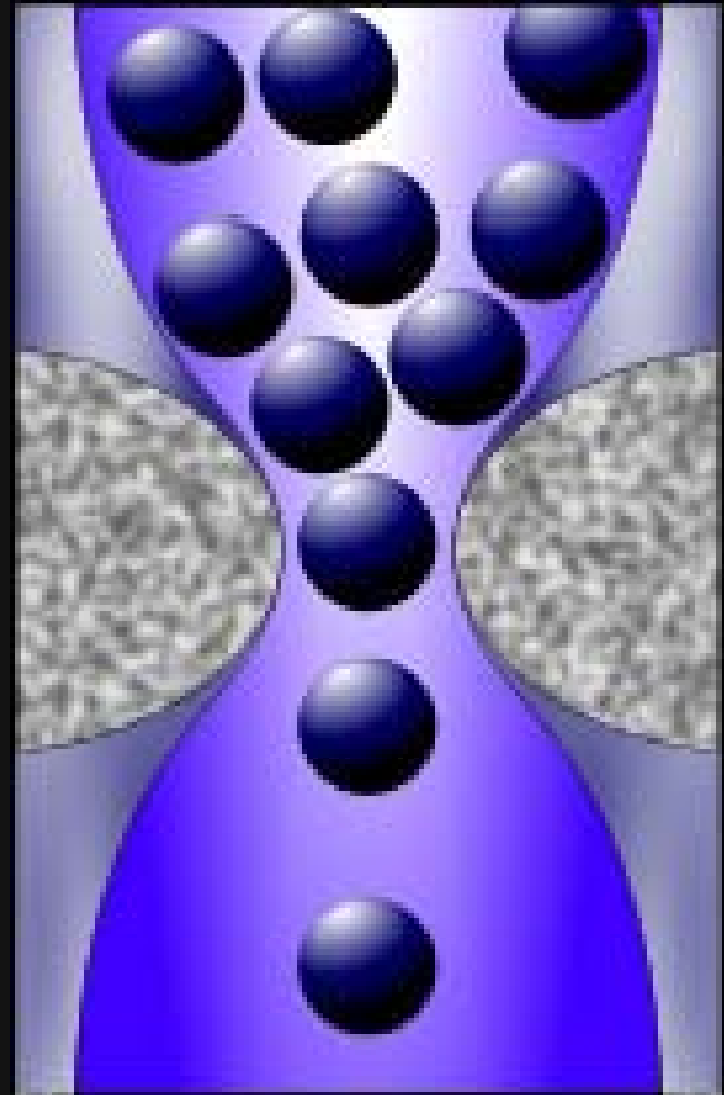
Evidence from Dichotic Listening

- **MacKay:**
 - Homographs were used
 - An ambiguous sentence is presented to the attended ear.
 - The sentence is disambiguated by information presented to the unattended ear.
 - Recognition performance was measured for both versions.

Indicates preliminary analysis of semantic information

Bottleneck Theory

- So the filter cannot be that rigid after all
 - We process things to some extent initially
 - If it is important we further process them
- Filter has to be a central filter, if it exists



Automatic vs. Controlled Processing

- According to Norman, we need not worry about filters.
 - Components of attention are the important thing
 - Automatic Component
 - Attentional (Controlled) Component

Automatic vs. Control Processing

Automatic

- Parallel
- Unintentionally
- Out of awareness
- Easy and/or familiar tasks

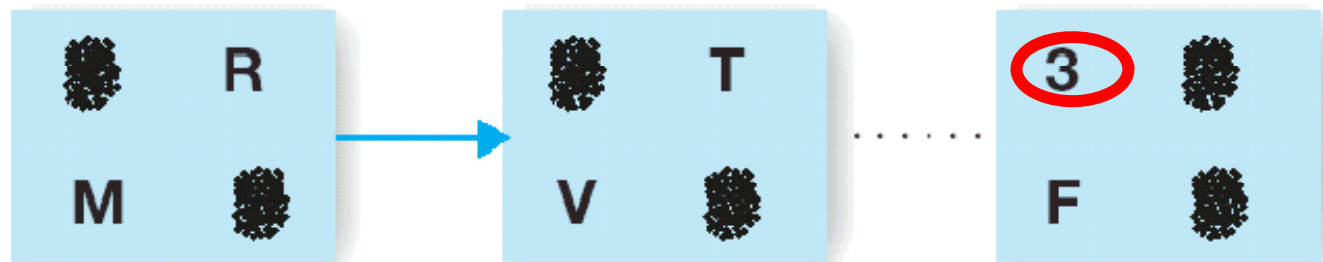
Controlled

- Serial
- Intentional
- In awareness
- Difficult and/or unfamiliar tasks

Shiffrin and Schneider



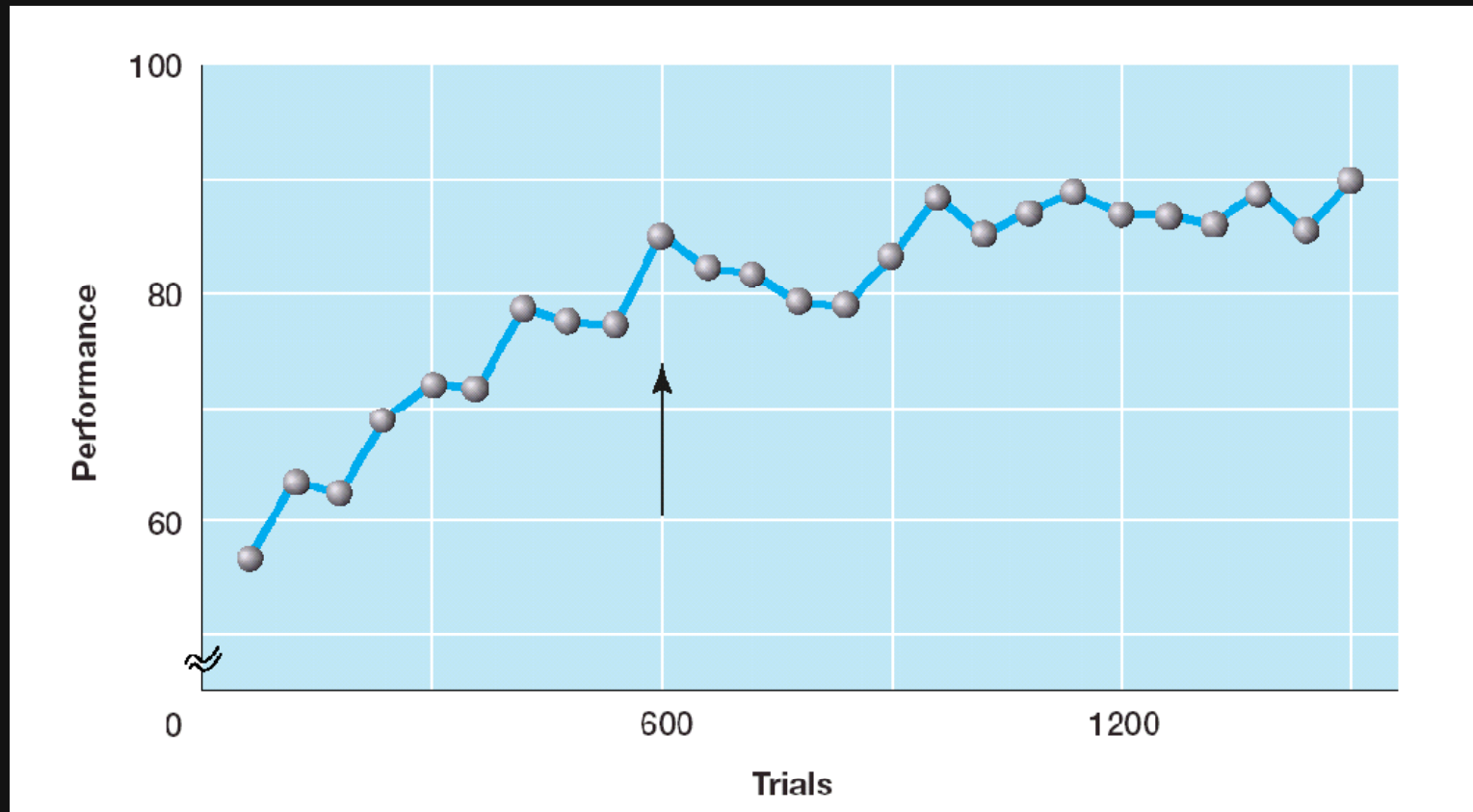
(a) Present memory set



(b) Present series of 20 frames (fast!)

(c) Was target from memory set present in a frame?

- Performance was automatized after 600 trials according to the subject reports



Feature-Integration Theory

Distributed Attention:

- Low-level
- Similar to automatic processes
- Uses parallel search

Focused Attention:

- Higher level
- Similar to controlled processing
- Uses serial search

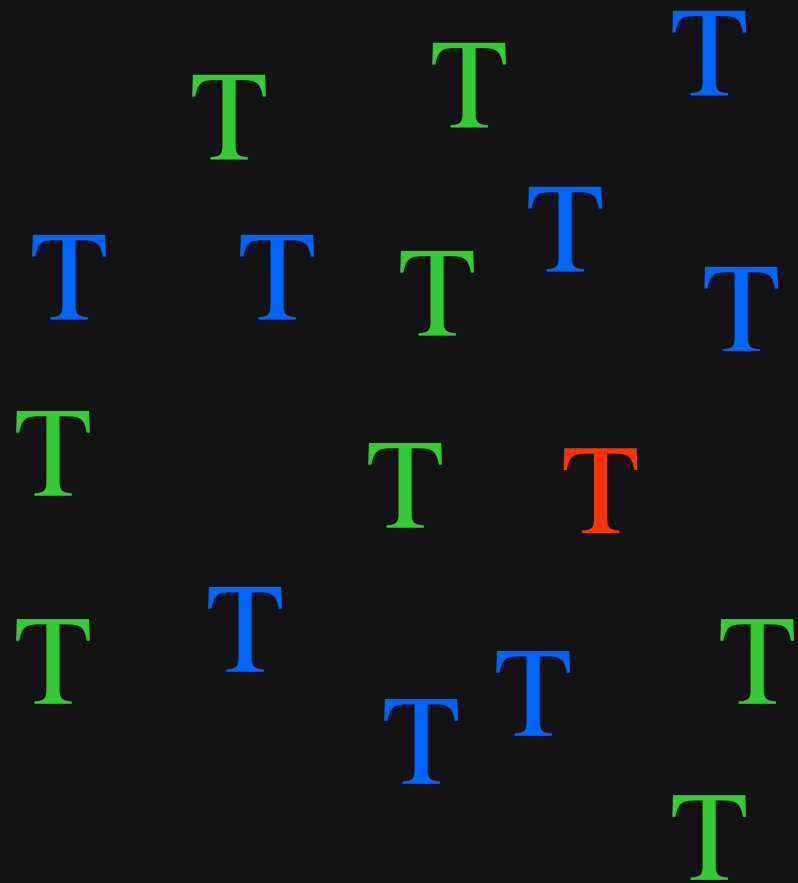
Feature Search

Is there a red T in the Display?

Target is defined by a single feature

According to feature integration theory the Target should “pop out”

No attention required



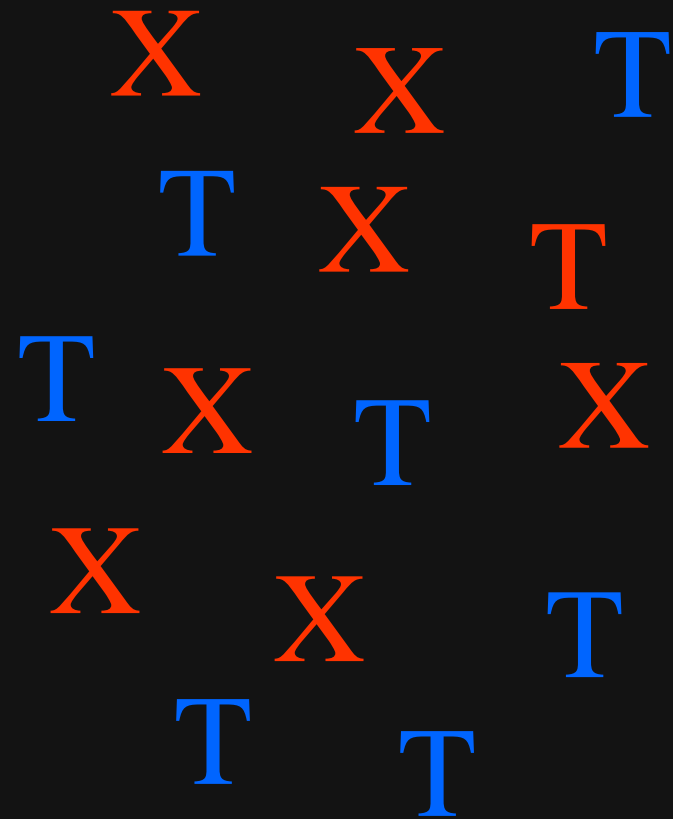
Conjunction Search

Is there a red T in the Display?

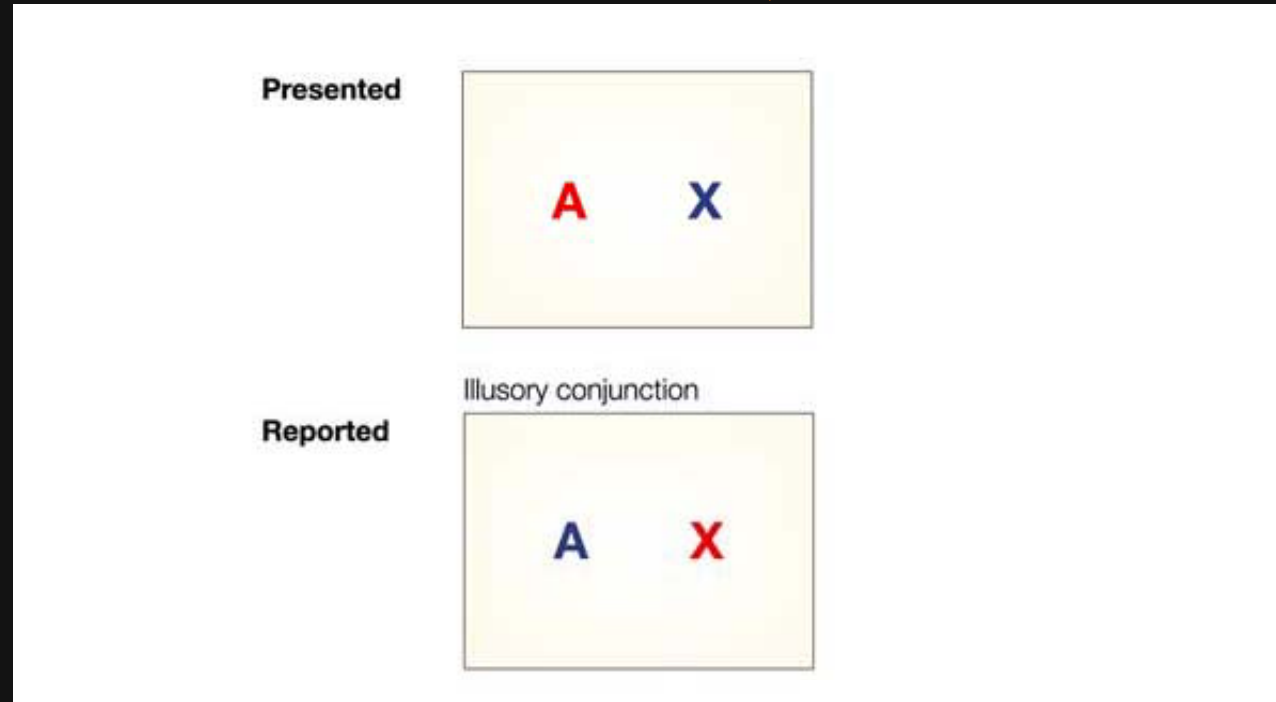
Target is defined by two Features: shape and color

According FIT, the features must be combined and so attention is required

Need to examine one by one



Illusory Conjunction



Evidence for processing features separately to some extent



Viewer

THE END