L380.20
Understanding and serving users

Class 4:

Users as psychological beings (1)

Understanding users - phase 1

- What is user-centeredness and how can we learn to be truly user-centered?
  - Methods
  - Process
  - Orientation

- Goal for you: be able to define the many facets of user-centeredness and apply specific methods to phases of a process

the psychology of the user (phase 2 of the semester)

- How should we think of “users”?
- User as a psychological being
- Parameters of human information processing
- Emergence of skilled behavior
- Individual differences

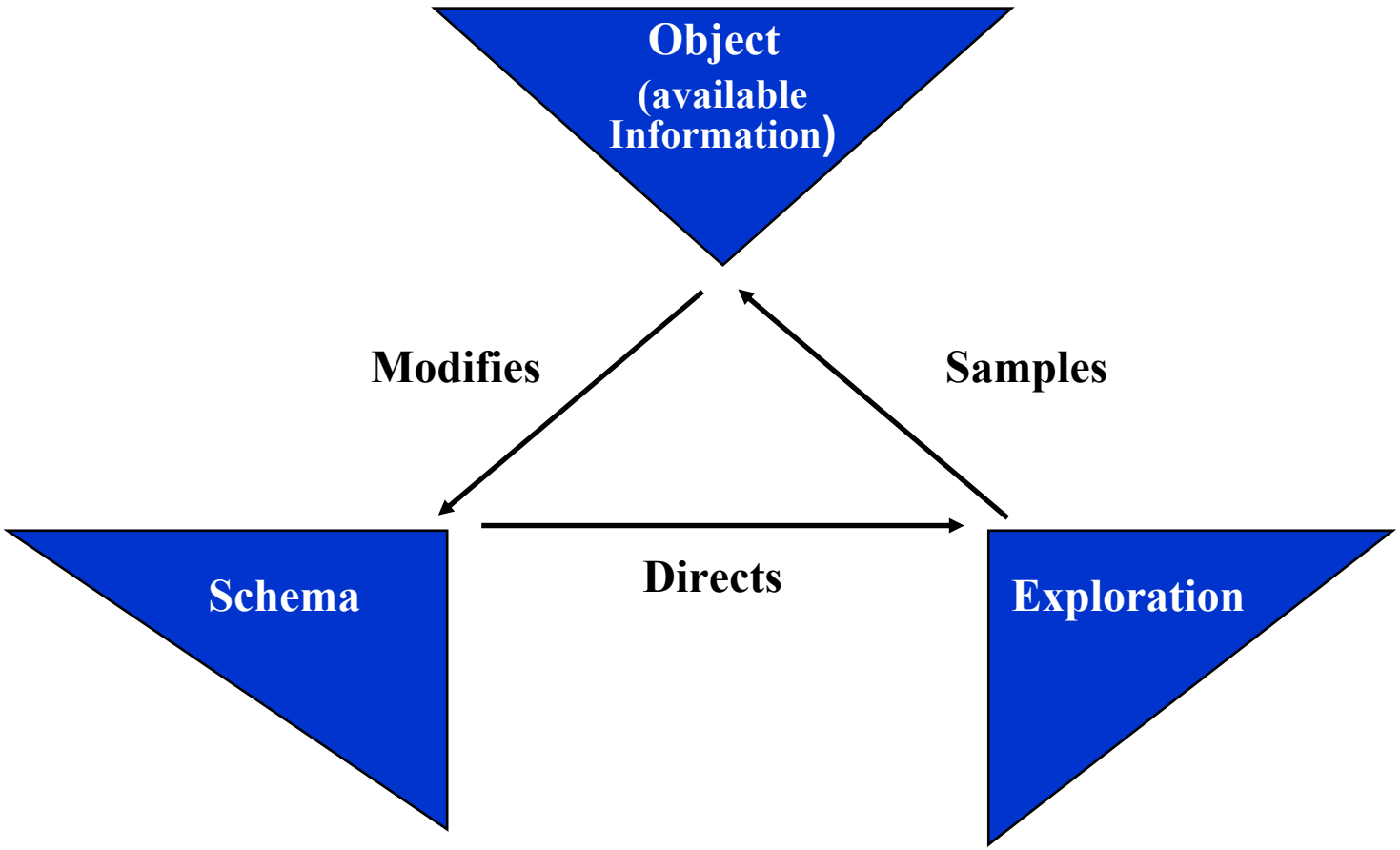
Four Levels of the User:

- Psychophysiological
  - Human as physical mechanism
- Perceptual
  - Human as sensing organism
- Cognitive
  - Human as thinking and feeling individual
- Social
  - Human as member of group, organization and culture

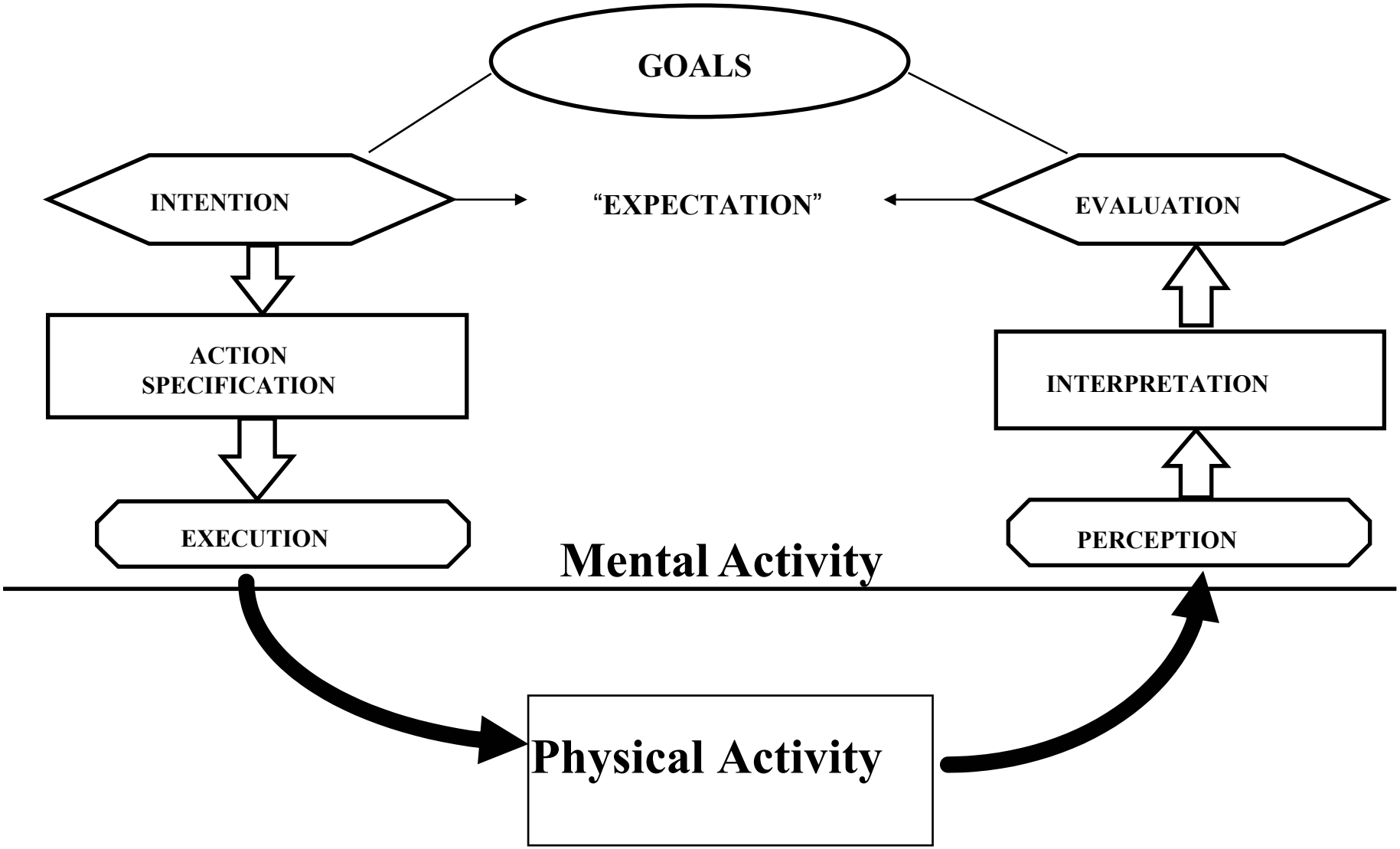
Basic properties of all users

- Changes with experience
- Actively learns
- Limited attention
- Makes mistakes
- Models the system in their mind
- Remains unique
- Goal oriented

The User as a Psychological Being



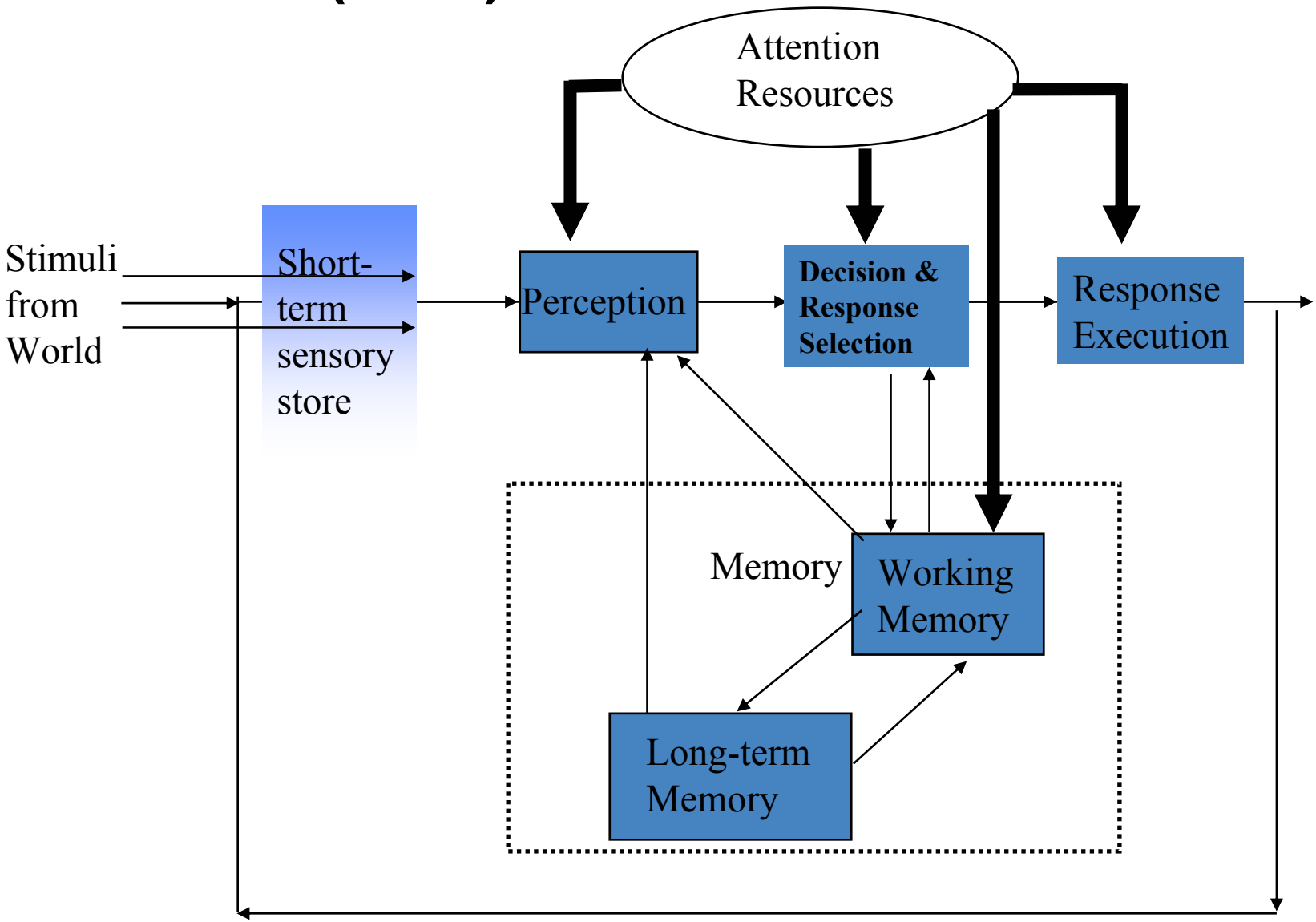
U. Neisser (1976) Cognition & Reality



Seven stages of user activities involved in the performance of a task

Don Norman (1987) ***The Design of Everyday Things.***

Wickens (1992)



Basic attributes

- Human cognitive system consists of structures
  - memory, (short and long term) schemata,etc.

and processes

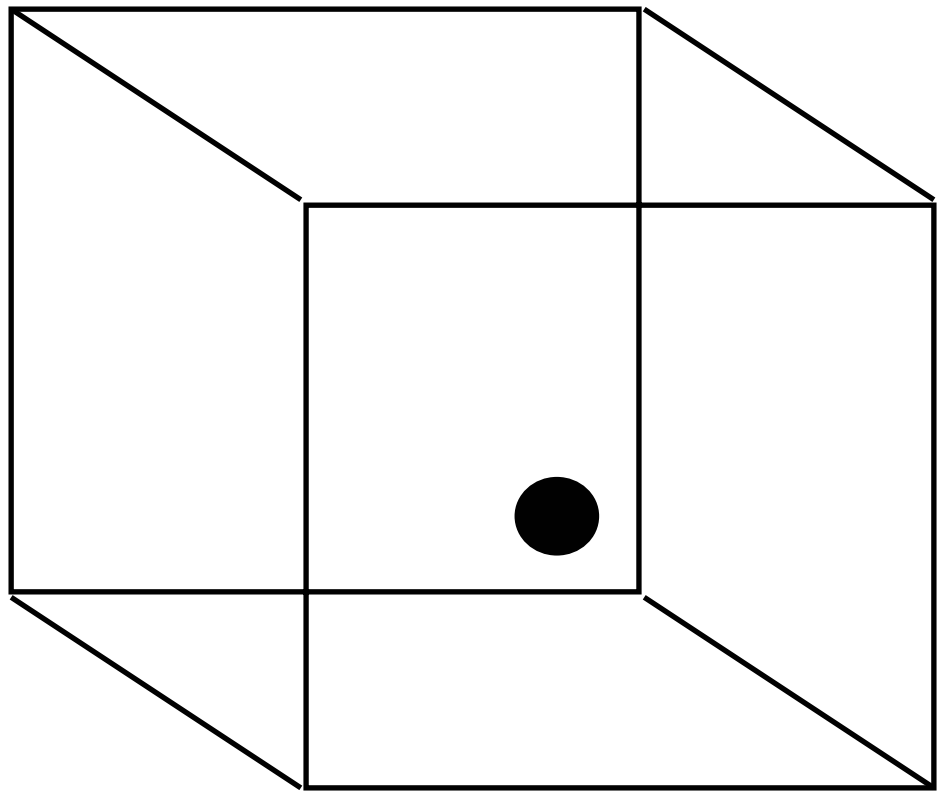
  - encoding, retrieval, assimilation etc.
- Human cognition is active:
  - we seek meaning, patterns and regularity

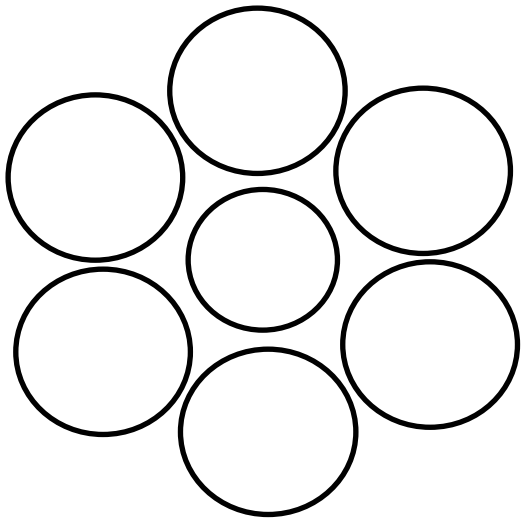
Cognition is fast & orderly

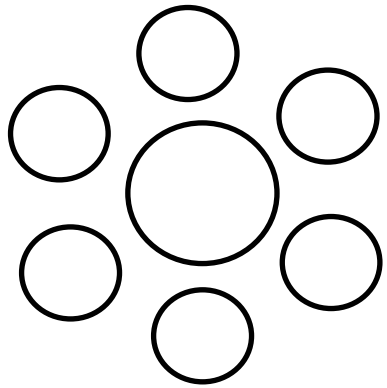
- Short-term sensory store
  - rapidly decays (<1sec)
  - sensitive to physical characteristics of signal
  - Pre-attentive (unconscious)
- Perception
  - many-to-one category mapping
  - detection, recognition, categorization cycle
  - stimulus is consciously attended to here

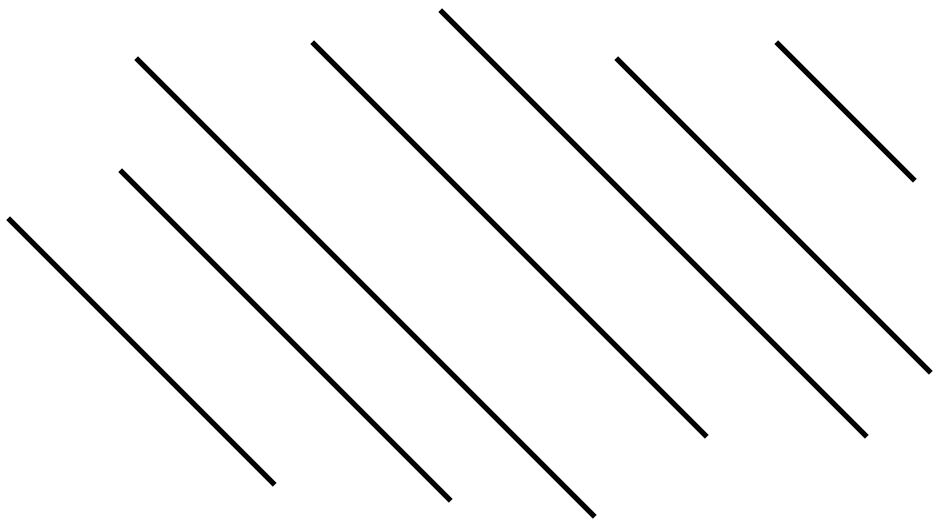
And then....

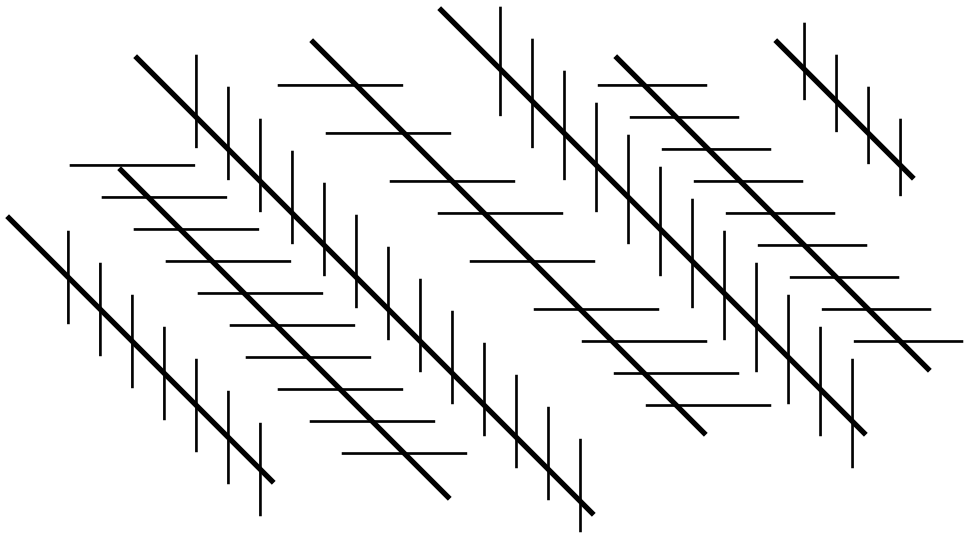
- Decision and Response selection
  - Once encoded, human must react
  - Can be automatic or controlled response
- Response execution
  - Sequence of behavior follows,
- Feedback
  - We monitor events and our actions
- Attention is usually required after STSS

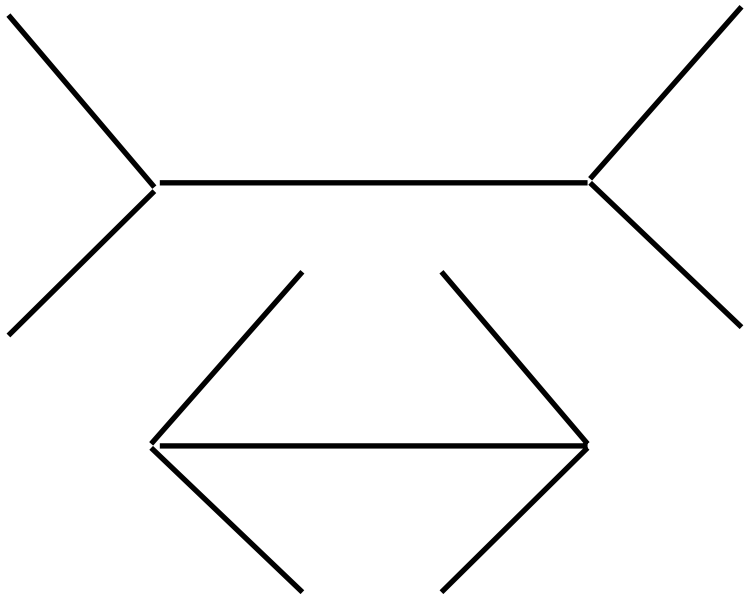


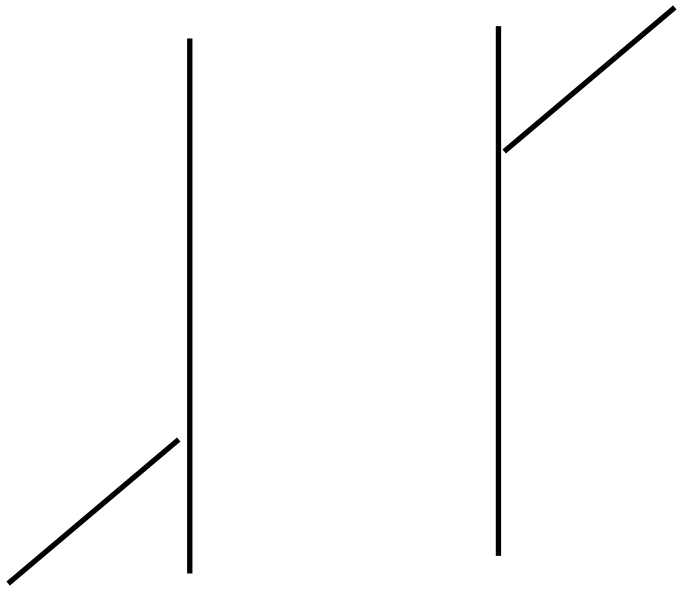


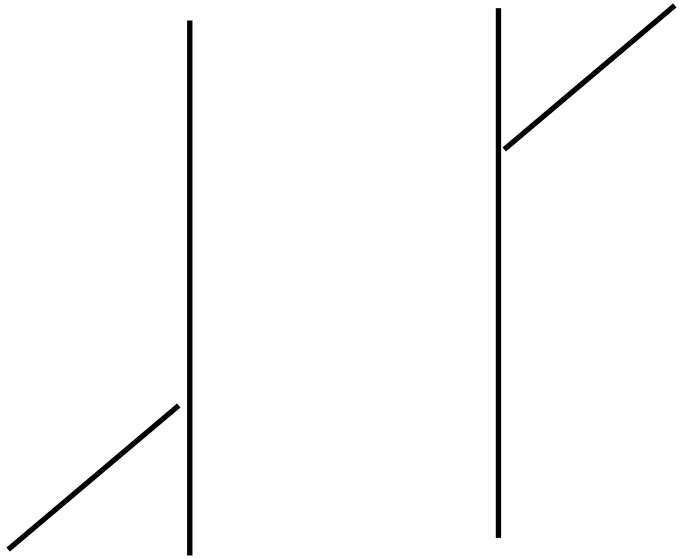












So?

- Perception is active and interpretative
- Interpretation is based on the visual data (“bottom-up”) and experience (“top-down”)
- You can partly choose the interpretation
- Interpretation of regular stimuli quickly becomes automatic
- Interpretation of irregular stimuli is heavily knowledge-based

Implications for design:

- Designer *never* sees exactly what the user sees
- Experience and repeated use narrow the interpretations of users
- Differences among users can lead to radically different perceptions of the information space

Gestalt principles of organization

- Proximity - 000 000 000
- Similarity - AAABBBCCC
- Closure - [] [] []

Grouping elements accordingly establishes perceptual structure and can improve visual search

Combine principles logically

- Proximity and similarity AAA BBB
- Proximity and closure [] [] []

- Avoid conflicting two principles

- Proximity opposing closure][ ][ ][
- Proximity opposing similarity AAA BBB BBC

- Space is an element of structure too.

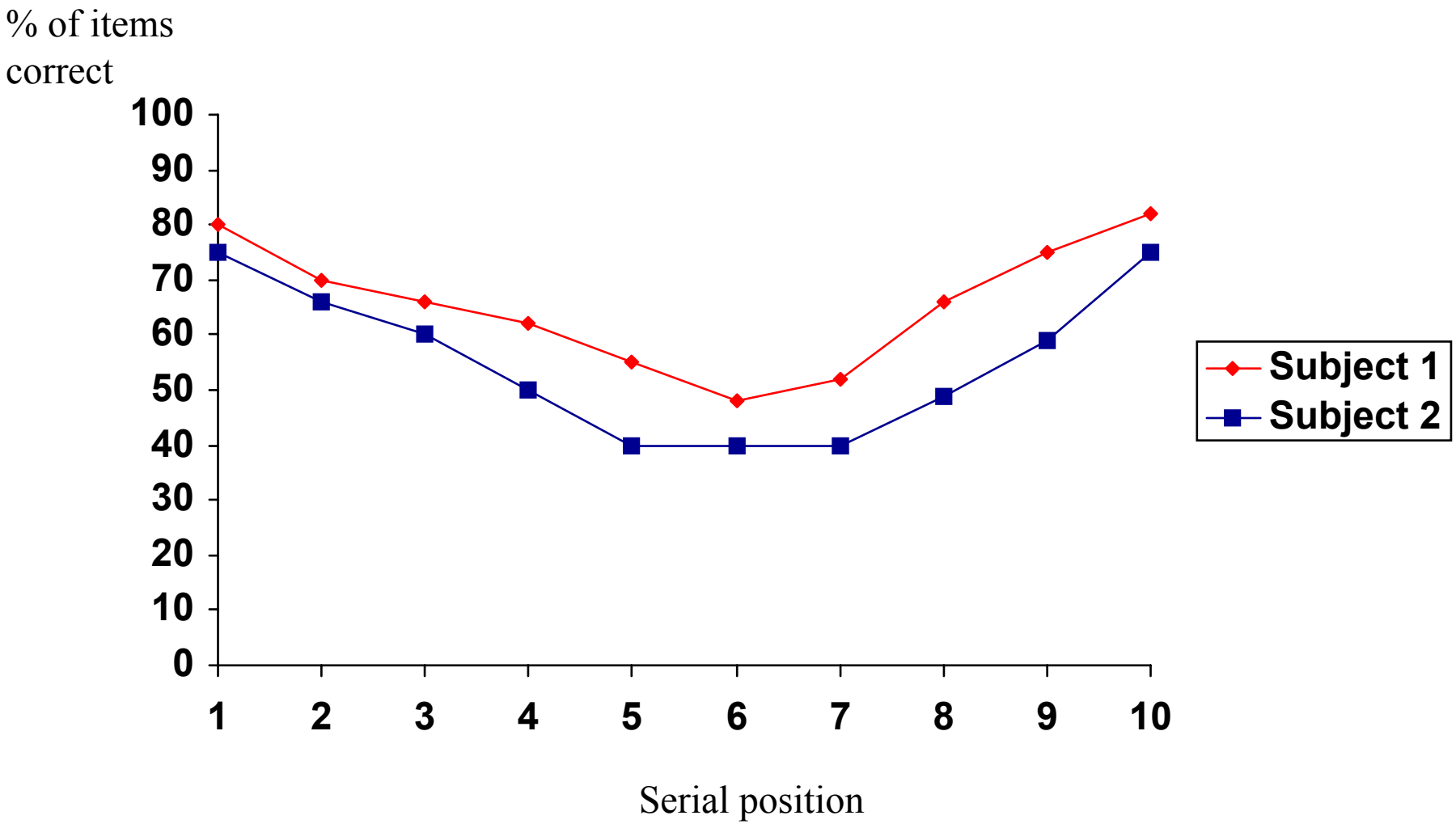
In interface design terms:

- Layout and structure of screens should
  - support perceptual grouping
    - -navigation and content
  - aid visual scanning
    - Use whitespace, color and headings to guide the eyes
  - aid location
    - Consistency of location matters
  - improve aesthetics
    - Interface beauty matters!

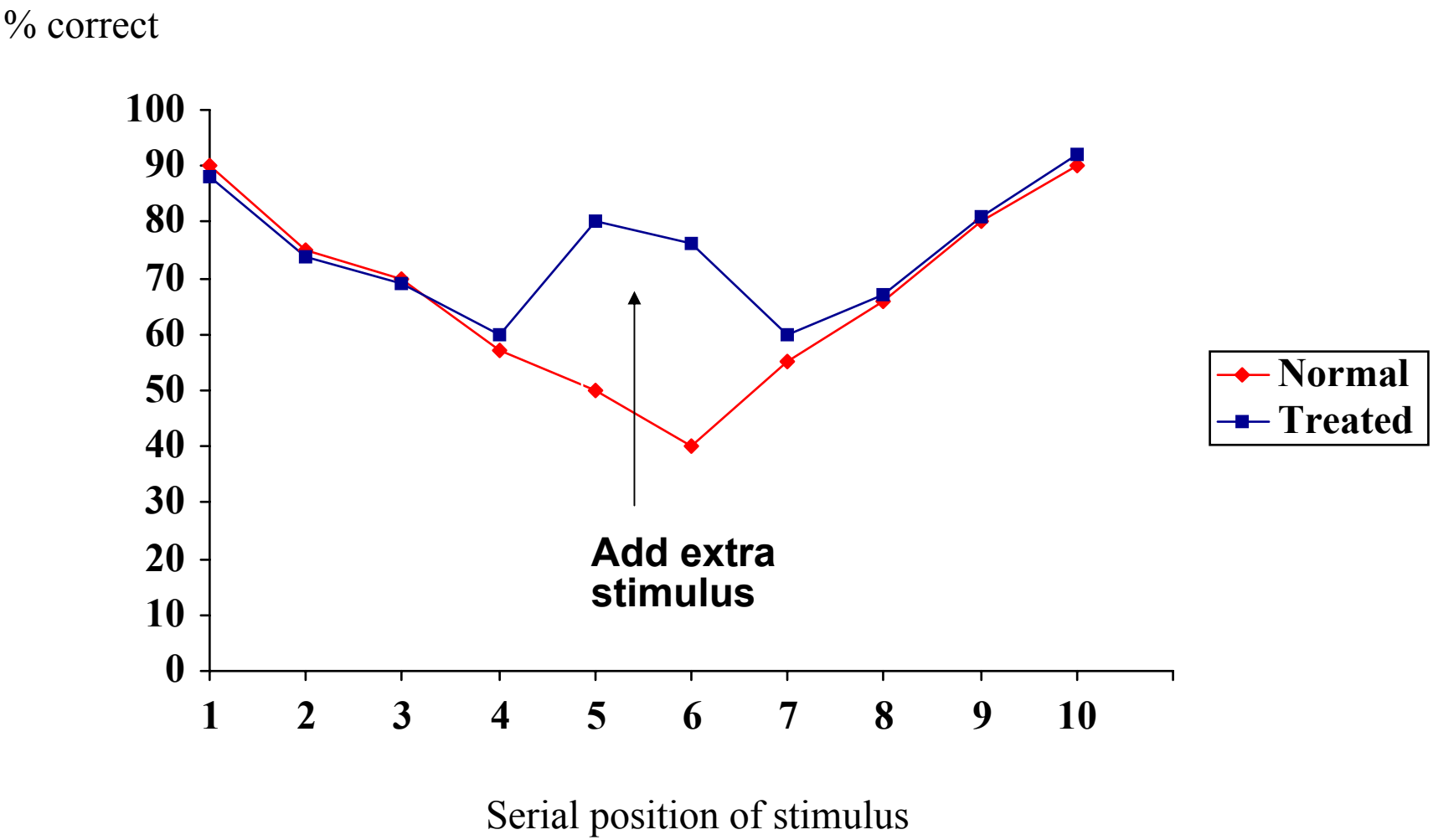
Working or Short-term memory (STM)

- Finite capacity buffer zone ($7^{+}/-2$ chunks)
- Limited duration (10-30 secs. decay rate)
- New information displaces old
- Rehearsal can maintain contents
- Chunking extends STM capacity

Primacy and Recency effects



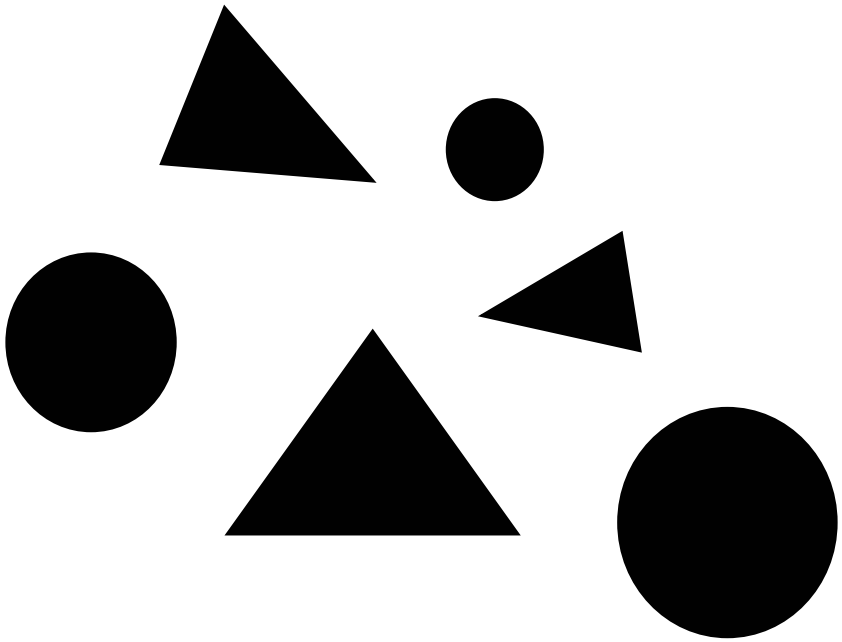
Added cues improve recall



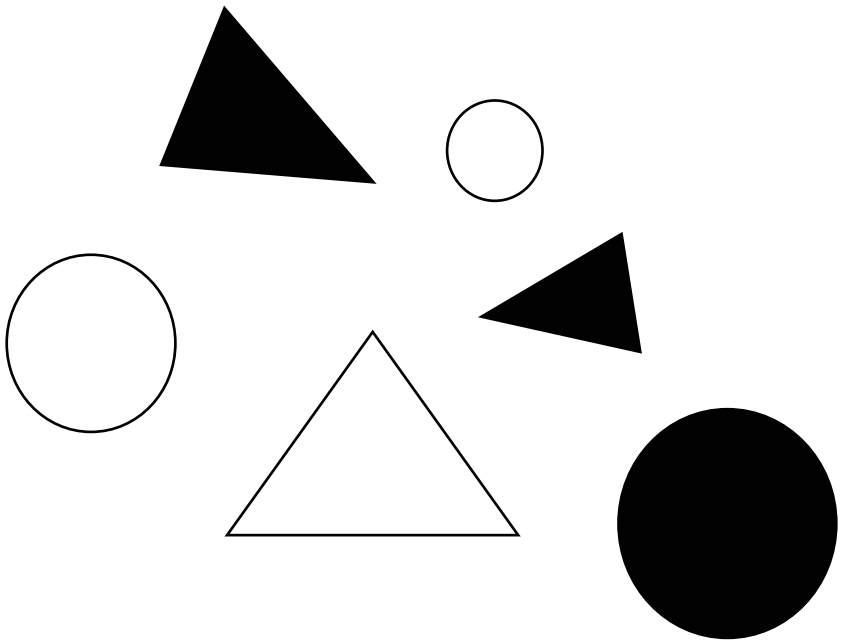
What cues are extra?

- For speech
  - accent,
  - intonation,
  - familiarity (enables chunking)
- For vision
  - color,
  - labels,
  - size,
  - emergent properties

Gestalt principle of Similarity



Which is dominant attribute?



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The value of chunking

- Expands capacity of working memory
  - The larger the chunk, the more you can recall

- Example :
  - S,U,N,I,B,M,M,A,C (9 units)

  - 3.1.7.8.5.4.3.2.7.2 (10 units)

The value of chunking for recall

- Become:
  - SUN, IBM, MAC (3 chunks)
  - 317- 854 3272 (1 chunk)
- Chunks must be meaningful for you

Meaningful chunking example

- Try to memorize the following:

onp, rph, dcb, sfb, itw,aso, src, aus, aat, t

Becomes more memorable as:

- npr, phd, cbs, fbi, twa, sos, rca, usa, att..

For next week

- Read!
- Observe chunking in your own behavior
- Test your working memory span
- Think how these issues apply in information contexts that you study