

B. BEHAVING: WHAT HUMANS DO THAT NEUROPSYCHOLOGISTS EVALUATE

1. Dimensions of Behavior (Lezak, 1995)

A. Cognition: Information-handling aspect of behavior

B. Emotionality: Feelings and motivation

C. Executive Functions: How behavior is expressed

A. Cognition: Information-Handling Aspect of Behavior

1. **Receptive Functions** The abilities to select, acquire, classify & integrate information

Sensory Reception An arousal process that triggers central registering, analyzing, encoding, & integrating activities

Perceptual Functions Active processing of the continuous torrent of sensations by means of awareness, recognition, discrimination, patterning, and orientation

Agnosias Disorders of recognition from impairments of perceptual interpretation

[A- + **gnosis** = **not** + **knowledge**]

2. **Memory & Learning** Processes by which information is stored & recalled

Declarative Memory Abilities to learn about and remember information, objects, & events

- Semantic
- Episodic
- Autobiographical (?)

Procedural Memory

- Skill memory
- Priming
- Classical conditioning

Retrograde Amnesia ↔ Event/Accident ↔ Anterograde amnesia ↔ Current time

3. **Thinking** The mental organization and reorganization of information

- Computation
- Reasoning & judgment
- Concept formation
- Abstracting & generalizing (analysis & synthesis)
- Ordering
- Organizing
- Planning

- 4. Expressive Functions** The abilities through which information is communicated or acted upon
- Speaking
 - Drawing or Writing
 - Manipulating
 - Physical Gestures
 - Facial Expressions
 - Movements
- Apraxias** Disturbances of purposeful expressive functions; typically involves impairment of learned voluntary acts despite adequate motor innervation of capable muscles, adequate sensorimotor coordination for complex acts carried out without conscious intent, and comprehension of the elements and goals of desired activity.
[A- + **praxis** = **not** + **doing**]
- Constructional Disorders (dyspraxias)** Disturbances in "formulative activities such as assembling, building, drawing, in which the spatial form of the product proves to be unsuccessful without there being an apraxia of single movements"
- Two types: **2-dimensional** construction & **3-dimensional** building tasks
- Aphasia** Defects of symbol formation of five types as follows:
- **Expressive** = defects (dysfluency) with relatively intact comprehension (Broca's/motor/syntactic aphasia)
 - **Memory/retrieval** = problems with relatively intact comprehension (anomic/aphasia)
 - **Programming sequences** = repetition defects, some garbled words, intact comprehension (conduction aphasia)
 - **Comprehension** = defects with fluent garbled/jargon speech (Wernicke's or fluent aphasia)
 - **Global** = expressive and comprehension defects in all modalities (global aphasia)
- 5. Mental Activity Variables** Behavior characteristics that concern the efficiency of mental processes
- A. Attentional activities** Attention, concentration, tracking
- Attention = capacity for selective perception
 - Concentration = effortful, usually deliberate and heightened state of attention in which irrelevant stimuli are selectively excluded from conscious awareness, i.e., inhibited

- Tracking = Attentively following or tracing a stimulus, e.g., visual stimulus or train of thought (conceptual tracking) over a period of time

B. Consciousness Psychological awareness of the self and the environment

Level of consciousness, an organismic state, ranges over a continuum from **full alertness through drowsiness, somnolence, stupor, to coma**

C. Activity rate Both **the speed at which mental activities are performed** and **motor response speed**

B. Emotionality: Feelings and motivation

Personality changes following brain injury may include

- Emotional dulling
- Disinhibition
- Diminution of anxiety (blandness or mild euphoria)
- Decreased social sensitivity
- Heightened anxiety
- Depressed mood
- Irritability, restlessness, low frustration tolerance
- Apathy
- Increased/decreased sexuality

C. Executive Functions: How behavior is expressed

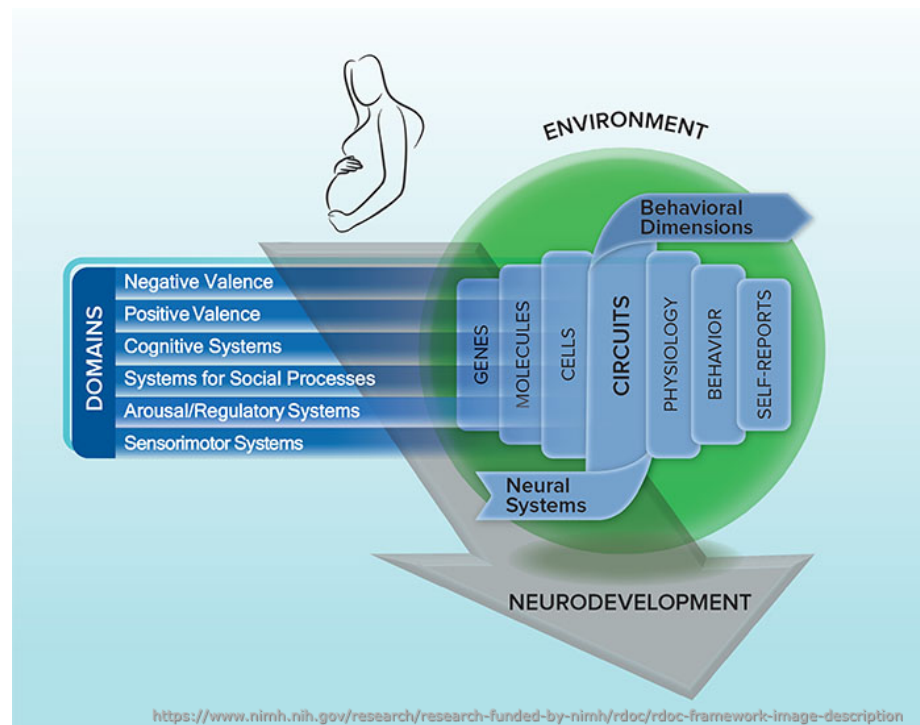
Capacities which permit a person to engage successfully in independent, purposive, self-serving behavior. Defects of executive function include

- defective self-control
- impulsivity
- loss/lack of initiation of activity (anergia)
- defective planning
- perseveration in behavior
- loss of goal-direction

Lezak, M. (1995). *Neuropsychological assessment* (3rd ed.). New York: Oxford University Press.

2. Research Domain Criteria (RDoC) • National Institute of Mental Health

<https://www.nimh.nih.gov/research/research-funded-by-nimh/rdoc>



Functional Constructs (concepts representing a specified functional dimension of behavior)

- **Negative Valence Systems**
- **Positive Valence Systems**
- **Cognitive Systems**
- **Systems for Social Processes**
- **Arousal/Regulatory Systems**

Negative Valence Systems = Systems primarily responsible for responses to aversive situations or context, such as fear, anxiety, and loss

- Responses to acute threat (Fear)
- Response to potential harm (Anxiety)
- Responses to sustained threat
- Frustrative non-reward
- Loss

Positive Valence systems = Systems primarily responsible for responses to positive motivational situations or contexts, such as reward seeking, consummatory behavior, and reward/habit learning

- Approach motivation
 - Reward valuation
 - Effort valuation/Willingness to work

- Expectancy/Reward prediction error
- Action selection/Preference based decision making
- Initial responsiveness to reward attainment
- Sustained/Longer-term responsiveness to reward attainment
- Reward learning
- Habit

Cognitive Systems = Systems responsible for various cognitive processes.

- Attention
- Perception
- Declarative Memory
- Language
- Cognitive Control
- Working Memory

Systems for Social Processes = Systems that mediate responses to interpersonal settings of various types, including perception and interpretation of others' actions

- Affiliation & Attachment
- Social Communication
 - Reception of Facial Communication
 - Production of Facial Communication
 - Reception of Non-Facial Communication
 - Production of Non-Facial Communication
- Perception & Understanding of Self
 - Agency
 - Self-Knowledge
- Perception & Understanding of Others
 - Animacy Perception
 - Action Perception
 - Understanding Mental States

Arousal/Regulatory Systems = Systems responsible for generating activation of neural systems as appropriate for various contexts, and providing appropriate homeostatic regulation of such systems as energy balance and sleep.

- Arousal
- Circadian Rhythms
- Sleep & wakefulness