

Cognitive Functions

- · Orientation
 - Ability to know one's self, time and place
- Attention
 - Ability to concentrate
- Memory
 - Immediate recall
 - Short-term memory
 - Remote or long-term memory
- Judgment
- Perception
- Language

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Individual- Developmental Stage -Environment

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- The interrelationships between the individual, the developmental stage and the environment are extremely important.
 - Decreased levels of cognition or perception require increased levels of environmental control.
 - Developmental stages play a significant role.
- Cognitive functioning of the individual must be evaluated within the context of the environment.

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Cognition

- Process with which one learns about the world and the objects in it and to understand the relationship between objects, between themselves and their world
- Cognition is the ability to learn and understand from experience, to acquire and retain knowledge, to respond to a new situation and to solve problems
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Cognitive Theorists

- · Beck's Cognitive Theory
- · Behavioral-cognitive theorists
 - Ellis: Rational Emotive Therapy
 - Glasser: Reality Therapy
- · Social Learning Theorists
 - Bandura
- Cognitive development Theorists
 - Piaget

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Cognitive Development in Children

- Children are born with inherent potential for intellectual growth
- Develop that potential by interacting with the environment
- Assimilating information through the senses, processing it
- Language, morals and spiritual development emerge as cognitive abilities advance

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Cognitive Development in Children

- Progressive acquisition of higher levels of cognitive skills
- · Natural unfolding of ability
- · Each stage is a foundation on the next
- · Sequentially predictable cognitive abilities
- Given adequate stimulation and an intact neurological system, the child gradually matures to be able to fully conceptualize
- Proceeds from motor activity to social interaction and finally abstract thought

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Piaget

- Piaget viewed the child as a biological organism acting on the environment
- Child's goal is to master the environment or to establish harmony or equilibrium between the self and the environment
- Piaget's cognitive theory focuses on how the mind works rather than what it does

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Piaget Concepts

- Assimilation
 - Taking in new information
- Accommodation
 - Revising and readjusting the cognitive structure for the new content
- Adaptation
- Change that results from assimilation and accommodation
- Schema
 - A cognitive structure
 - pattern of action or thought
 - A complex concept of motor and internalized thought process

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A scheme is used to assimilate (take in) new experiences or a scheme can be accommodated (modified) by new experiences

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Piaget's Stages

- Sensorimotor
- · Preoperational
- · Concrete operations
- Formal operations

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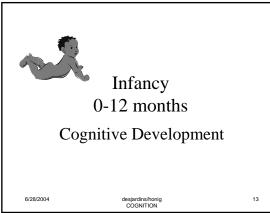
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AVAILABILITY OF PLAY AND THE QUALITY OF THE PARENTAL INVOLVEMENT ARE THE 2 MOST IMPORTANT VARIABLES RELATED TO COGNITIVE DEVELOPMENT DURING INFANCY AND PRESCHOOL

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Early Sensorimotor Phase Infancy

- Birth to 24 months
- Progress from reflexes to simple repetitive acts to intentional and imitative behavior
- · Learns through motor activity without the use of symbols.
- Knowledge of the world is limited (but developing) because its based on physical interactions / experiences
- · Hand -mouth and ear-eye
- · Recognize new experiences and repeat pleasurable ones
- · Grasping, reaching, listening

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Early Sensorimotor Phase

- 3 crucial events occur during this stage
 - separation,
 - object permanence and
 - ability to use symbols and mental representation

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Separation

- Separate themselves from other objects in the environment
- · Understand that others control the environment
- Must make adjustments for mutual satisfaction to occur
- · Body image
 - Child is separate and distinct from parents
 - Motor skills help child to explore themselves
 - Transmit messages about themselves

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Separation anxiety

- Separation anxiety (4-9 months)
- Stranger fear: recognize the difference between familiar and unfamiliar
- · Parent returns to work
- Introduction of child care

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Object permanence

- · Objects that leave the visual field still exist
- · Acquired at about 9-10 months
- · Peek a boo
- Highchair play

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Symbols and Mental Representations

- · Use of symbols
 - Beginning of communication
 - Associates symbols with events
- Child is able to think of an object or situation without actually experiencing it
 - Based on own experience
- · Beginning to understand time
 - Before and after

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Symbols and Communication

- Language moves from reflex-crying
- Syllables and words-mama,
- 3-4 mo coo, gurgle and laugh
- 9-10-comprehension of NO
- 10-11 mo-meaning attaches to words
- 12 mo-3-5 meaningful words

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Perception in Infancy

- Perception is the recognition of an event within the environment
- From birth the infant possesses sensory capabilities
- Senses become organized neurologically into a pattern of behavior that will influence all subsequent development
- You will use this knowledge to of the infants perception to facilitate parent/child interaction and to guide parental counseling

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Vision in Infancy

- Visual impressions are unfocused, strange and without meaning
- Stimuli must be bright, moving or flashing to capture the infant's attention
- Eyes are well developed but the muscles that move the eyes are not
- Un coordinated until 3-6 months

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Hearing in Infancy

- · Can hear in utero
- Hearing is acute
- One of the better senses developed at birth
- Can distinguish between frequencies and turn toward a voice or sound
- Sounds gradually gain significance and meaning as they are associated with caregiving, food or pleasure

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Smell in Infancy

- · Fully developed at birth
- Within 2 weeks the infant can distinguish the odor of mother's milk
- Association of parents' body odors is important to the infant/parent bonding

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Touch and Motion in Infancy

- Tactile sensation is well developed at birth, especially the lips and tongue
- · Perception of motion and touch important
- · Rocking and skin to skin touching
- Touch helps to relieve unspent tensions of the infant and accelerates neuromuscular development (Olds, et al, 1996)

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Language in the Infant

- · Follows a sequence
- Crying is a communication
- 2-3 months cooing
- 6 months babbling
- 9-10 2 syllable sounds

• 12 mama, dada, bye bye

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Cognitive Development

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Late Sensorimotor Phase Young Toddler

- 12-18 months
- · Memory beginning
 - Some symbolic (language) abilities are developed at the end of this stage
- · Solves problems by trial and error experimentation
- Mobility allows the child to begin developing new intellectual abilities.
- Physically manipulates new object to determine how the new thing works

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Late Sensorimotor Toddler

- 18-24 months
- Solving problems by mental rather than physical experimentation
- Manipulating the object, child will look intently and "analyze" the new object and proceed to "solve the problem" on a mental level

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Older Toddler

- Toddlers imitate living and nonliving objects
- Imitation is an example how the toddler "analyzes" an event before engaging in the activity
- Play takes on an increasingly symbolic meaning in the activity
 - fun and pleasure remains
 - play objects represent another object (block is a bus)

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Older Toddler

- · Object permanence is achieved
- The object exists and it has permanence even though it can not be seen

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Egocentricism

- · Egocentric in thinking and behavior
- Things and events are seen from a personal and narrow perspectives and are happening because of self
- Sees everything through their own perspective and not realizing that other points of view exist
- Inability to envision situations from other's perspective
- Inability to share—only for themselves

 not selfish

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Temper Tantrums

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- Toddlers delight in their own skills and love repeating actions for an appreciative adult
- Verbal praise, smiles or hand clapping are effective reinforces at this age
- Toddlers will often take on tasks which are beyond their abilities—result in frustration and the well known temper tantrum

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Preoperational Phase

- 2-4 years
- Increased use of language and symbolic thinking
- A word, gesture or image stands for the and object, person or event
- · memory and imagination are developed
- thinking is done in a nonlogical, nonreversable manner
- · Egocentric thinking predominates

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More socialized

- Preconceptual stage goes from purely self satisfying behaviors to early socialized behavior
- Becoming more interested in other children Play for the child younger than 3 is rarely shared
 - parallel play is the rule
 - doing a similar thing, but not working together

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Play and Symbols

- · Symbolic meaning of play
- Child will act out entire scenes of imagined event
- Imaginary companions
- Child gathers facts as they are encountered and neither separate reality from fantasy nor classify or define events systematically

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Communication and symbols

- · Increase us of language as mental symbol
- Language does not fully represent the thought processes nor does it fully express the symbolism in thought capacity
- Relationships between the representative symbol and the object itself exists internally first, before it can be expressed in language

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Vision in Toddler

- Depth perception is poor (clumsy)
- Acuity is improving 20/30
- Recall of images which increasing skill to describe past events
- Strabismus and amblyopia (0-4 years)
- Screen for strabismus, cataracts, light reflex

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Language in the Toddler

- · language, memory and decision-making
- 18-24 months
 - short phrases
- 30 months
 - understands up to 2400 words and
 - uses 425 word

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Pre-School 3-5 years

Cognitive Development

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Preoperational Preschool

- Egocentrism
- Concrete thinking
- Animism
- Magical thinking
- · Fantasy and reality
- · Absolute thinking

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Egocentrism

- Unable to envision situations from perspectives other than one's own
- Cannot take into account more that one factor in solving a simple problem
- Visual limitations, one perspective only
- Explanations of "hurting"

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Concrete Thinking

- Ability to function symbolically using language
- Child runs through the mental representations as if he/she were participating in the event
- The real event is necessary

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Animism

- Endowing all things will qualities of life
- Preschooler fluctuate between reality and fantasy and
- Fluctuate between materialistic and animistic point of view
- When injured, the toy hurt him/her

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Magical Thinking

- Believes that thoughts are all powerful and can cause events
- Wishes bad for someone and it happens
- · Someone gets sick, divorce or death

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More Preschool Cognition

- Absolute thinking
 - all or nothing)
- Centrism
 - Thoughts are centered
 - focused on a single aspect of an object
 - distorted thinking
- · Concepts of time
 - child can differentiate today, yesterday , tomorrow

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Role of Play

- Exploration and manipulation, children learn the significance of objects, associate words with objects, develop and understanding of abstract concepts and spatial relations (up, down)
- Puzzles-problem solving
- · Books, stories-expand knowledge
- · Opportunities to practice and expand language
- Relive past experiences and incorporate them into new perceptions and relationships
- · Comprehend the world they live in
- · Distinguish between fantasy and reality

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Play and the Preschooler

- Play becomes more orderly, incorporate more reality into play, increasingly imitate the social rules of society
- More social interactive play
- · Imaginary friends
 - totally controlled by the preschooler
 - practice social interactions with IF
 - control a friend or fear
 - blame someone for mishaps

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Vision in the preschooler

- Maximal vision is achieved by end of preschool years
- · Deteriorates from here on
- · Screen for all previous and acuity

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Hearing in the preschooler

- Reaches maturity between 3-4 years
- · Critical to development of speech and language
- Seek repetition of auditory input and so may endlessly repeat a combination of sounds or words
- Otitis media
- Screen
 - gross, play audiometry
 - receptive language and expressive language

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Language in the Preschooler

- 3 years
 - Uses plurals
 - Knows name
 - Know prepositions
- 4 years
 - Uses longer phrases and sentences
 - Understood by others
 - Asks many questions

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School Age 5-11 years

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School age and Concrete Operations

- · Based on the child's mental action
- Depend on the ability to perceive concretely what has happened
- Child moves from egocentric interactions to more cooperative interactions
- Logical and systematic manipulation of symbols related to concrete objects.
- · Mental actions that are reversible

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Cognitive Accomplishments School age

- Conservation of matter
- · Concept of time matures
- · Classifies and groups
- Moves from intuitive to logic or rational operations
- Orders
- Nesting
- Reversibility

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Conservation of Matter

• Certain properties of an object remain the same, in spite of changes in other properties



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Concept of Time

- · Past and present
 - history
- · Young and old person

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School Age Cognition

- Sorting
 - objects in groups according to specific and multiple attributes
- Ordering
 - objects according to decreasing or increasing measure
- Nesting
 - understanding how a sub concept fits into a larger concept
- Reversibility
 - returning to a starting point or performing opposite actions

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Vision in the Schoolager

- 20-30% of this age group do not have normal vision
- 75% are not detected for a long period
- Myopia (nearsightedness)caused by an elongated eyeball
- Astigmatism blurred vision caused by poorly focused image on the retina
- Screen

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Hearing in the Schoolagers

- · Hearing deficits are less common
 - 3-5% have hearing deficits
- Language
 - can understand and speak, begin to read and write
- · Screen hearing regularly
 - audiometry and tympanogram
- · Assessment tools for primary care
- Psychoeducational evaluations for learning disabilities

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Adolescence

Cognitive Development

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Piaget's Theory

Formal Operations Stage

- Piaget uses the term formal to represent the adolescent's focus on the "form" of thought, objects, and experiences rather than on the exact content.
- Adolescents have the ability to see new kinds of logical relationships between classes or between and among several different properties.
- Main feature children can enter into possibilities beyond the world of reality and use hypotheticaldeductive reasoning.

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A time of change

- Tend to be extremely idealistic
- Constantly challenge the way things are
- Consider the way things could be or ought to be.
- May totally discard what is.
- Introspective
- Feel they have a special destiny or are immortal

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Education of Adolescents in the US

- Emphasis in education and the work world is on logical, analytical, critical and convergent thinking. The goals of this are precision, exactness, consistency, and correctness of response. (left hemisphere)
- Original concepts do not necessarily arise from logical thinking but with newfound ability to have abstract thinking adolescents may have interest in music art etc.
 - Creativity uses the right hemisphere

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Gender Differences



- There are no overall differences between female and male adolescents' intelligence
- Females have shown greater verbal skill and often show a preference for literature, composition, history etc.
- Males show more facility with quantitative and spatial problems and prefer math and science.
- These differences are the result of interest, social expectations, and training rather than different innate mental abilities.

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Young Adult 20's and 30's

Cognitive Development

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Physical Patterns

- Brain cell development reaches its peak in the twenties.
- Memory is thought to peak at the time when brain weight peaks and then slowly begin to degenerate around age 30.
 - In the 20's young adults make good use of their "gray cells" trying to learn and do well which enhances their cognitive abilities.
- The physical senses like vision and hearing are at their peak around age 20

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Piaget's Theory

Stage of formal operational thought

- Allows a person to analyze all combination of possibilities and construct hypotheses that are capable of being tested.
 - Thoughts become more perceptive and insightful
 - Issues therefore are evaluated more realistically and objectively
 - Can contribute to social and occupational decision making
 - Although tend to take greater risks, usually demonstrate the use of appropriate reasoning and analytical approaches.
- Young adults use formal operational reasoning as long as the social environment and acquired experience provide sufficient cognitive and intellectual stimulation.
- Young adult intelligence is an excellent predictor of older adult performance

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Mental Patterns

- Young adults have an achieving, task-related and more competitive style of cognitive behavior.
- Intellectual maturity is necessary for adult decision making and older adults tend to become more responsible.
- Young adults tend to apply their cognitive skills toward entering the world of work, establishing their own family units and meeting their own personal goals.
- The development of intellectual maturity influences the selection of behaviors and attitudes that affect health and well-being practices.

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Gender Differences



- · Brain structure is the same in men and women.
- The female's brain matures earlier; thus the two hemispheres are more integrated in the female
- As adults, women are better able to coordinate activities of both hemispheres; thus they can think intuitively and globally.
- Men are better at activities in which the two hemispheres do not compete, such as problem solving and determining spatial relationships.

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Middle Age Adult 30's and 40's

Cognitive Development

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Physical Patterns

- · Vision -
 - Presbyopia, or farsightedness, begins and is easily corrected with glasses
- The other senses remain stable until age 45 to 50.

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Mental Patterns

- Intellectually, the thirties and forties are very good years.
 - The brain weight begins a gradual and progressive shrinking that causes impulses to travel slightly more slowly, and that in turn causes a decrease in reaction time. Mental sharpness is still high.

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Fluid and Crystallized Abilities

- · Fluid intelligence
 - refers to capabilities such as associative memory, abstracting, inductive reasoning and problem solving.

 Dependent on neurophysiological functioning and intact CNS

 - May diminish slightly following adolescence
- · Crystallized intelligence -
 - Refers to skills such as verbal comprehension and handling of word relationships
 - Dependent on learning and experience
 - May increase with advancing years
- The average intelligence may look about the same over the middle years because the increases in crystallized intelligence balance the loss in fluid intelligence.

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Cognitive Development

- Reaction time or speed of performance-
 - Is individual and generally stays the same or diminishes during late
- Time for new learning
- Decreases with age but ability does not change
- Memory
 - Maintained through young and middle adulthood
 - Some quantitative changes
- Memorize less readily if material is oral or disorganized
- Learning
 - Capacity of growth is unimpaired and enhanced by interest, motivation, flexibility, humor, confidence and maturity.
- Problem-solving abilities
- When there is not time limitation, there are no task differences 6/28/2004 desjardins/honig COGNITION

Beyond Piaget

- · Piaget states formal operations is the final period.
- Arlin proposed a problem finding stage or post formal thought characterized by creative thought in the form of discovered problems, use of intuition, insight and development of significant scientific thought.
- Schaie proposed that different experiences provide different stages of cognition based on problems to be solved:
 - Childhood is characterized by achieving
 - Early and middle adulthood characterized by a responsible stage of managing affairs
 - Later adulthood is characterized as reintegrative, selecting which cognitive skills to apply to hosen tasks to achieve a sense of integrity.
- Riegel proposed a period of dialectic operations that are conflict resolution.

Gender Differences



- Some women's need to achieve drops far below that of men in adulthood. They seem to prefer maintaining relationship and watching over the psychosocial aspects of living.
- Older women with high achievement needs have been shown to express an even greater independence and self-reliance than achievementmotivated women in their twenties.
- Many women and some men return to school in their thirties and forties.



Middle Age Adult 50's and 60's

Cognitive Development

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Physical Patterns

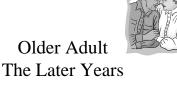
- Vision
 - Decreased peripheral vision and visual sensitivity in the dark due to clouding of the cornea
- - Presbycusis or impaired auditory acuity, lose higher sound frequencies such as a woman's voice
- - Progressive loss of taste buds, first for sweet and salt leaving detection of bitter and sour

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Intellectual Skills

- Mature adults can use experience to imagine, anticipate, plan and hope.
- Person develops an inner private world that give them resources for happiness and potential for anxiety.
- Mature adult is interested in other persons and warm, enduring relationships
- Adaptable, independent, self-driven, conscientious, enthusiastic and purposeful.
- Struggle with morality, ethics, philosophy, religion and politics.

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Cognitive Changes

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Why do older adults slow down?

- · Decreased visual and auditory acuity
- · Slower motor response to sensory stimulation
- · Loss of recent memory
- · Divided attention
- Greater amount of prior accumulated knowledge and learning that must be scanned and appropriately placed mentally
- · Perceived meaninglessness of task
- · Changed motivation

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Factors affecting Intellectual Functioning

- · Overall health status
 - Anemia, lung disease, poor circulation hypertension, diabetes, thyroid or nutrition imbalance
- Medications

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- Polypharmacy
- Prescribed and OTC may slow or interfere with cognition based on slower elimination
- · Sensory impairments
 - Specially vision and hearing that interfere with integration of sensory input
 - Affects fluid intelligence
- Using more time to do something or deliberate caution
- Adaptive mechanism of conserving time and emotional energy rather than showing assertion.

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Aging Effects on Cognition

- Onset, rate and pattern of aging are unique for each person.
- Within an individual, the cognitive functions do not change or decline at the same pace.
- Age alone does not ruin memory
 - Alzheimer's or other dementia
- · Disruption of formation of new memories
 - ETOH
 - Too little sleep
 - Depression

- Hypothyroid

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Intelligence in Older Adults

- · Overall, mental ability increases with age.
 - A bright 20 year old will be a bright 70 year old
- Around age 70, the loss of biological potential is evident but offset by acquired wisdom, experience and knowledge (crystallized intelligence).
- There is no uniform pattern of age-related changes for all intellectual abilities, nor is there a consistent decline in all elders
- Physical fitness, especially cardiovascular fitness, helps maintain intellectual functioning.
- Intellectual exercises (crossword puzzles, writing, continuing education) may also help maintain function.

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Differentiating Normal Aging from Dementia

Age-associated memory impairment (AAMI)

• Cognitive changes, such as a general slowing in the speed of thought processing and slight declines in memory and in the ability to manage multiple tasks simultaneously, are considered part of the normal aging process.

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Differentiating Normal Aging from Dementia

Mild Cognitive Impairment (MCI)

- · Memory complaint
- · Normal activities of daily living
- Normal general cognitive function
- Abnormal memory for age
- Not demented



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Definition of Dementia

- Dementia refers to an acquired persistent loss of intellectual functions due to a brain disorder.
- Dementia is really a broad, umbrella term.
 - A medical diagnosis is required to determine the underlying cause or causes of symptoms.
 - In the past, terms like "senility" and "hardening of the arteries" were commonly used.

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Warning Signs of Dementia

- · Memory loss that affects job skills
- · Difficulty performing familiar tasks
- · Problems with language
- Disorientation to time and place
- · Poor or decreased judgment
- · Problems with abstract thinking
- · Misplacing things
- · Changes in mood and behavior
- · Changes in personality
- · Loss of initiative

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