CMPE 80A:
Universal Access: Disability, Technology, and Society

Children

Piaget (1896 - 1980)
► Swiss Psychologist, worked for several decades on understanding children’s cognitive development
► Was intrigued by kids’ thoughts & behavior, & worked to understand their cognitive development
► Credited for founding constructivism
  ▪ All learning is constructed, whether it is something we are taught or something we learn on our own.
  ▪ We are driven or motivated to learn when we are in disequilibrium stage (need to understand things).
► Has had a large influence on American schools

Factors that Impact Child Dev
► Biological development
  ▪ Children are not miniature versions of an adult.
  ▪ A child’s abilities coincide with the development of his/her CNS, particularly the brain.
  ▪ This 'co-development' with the CNS often becomes more easily overlooked as the child gets older.
► Environmental development
  ▪ Those with primary child-rearing responsibilities are most likely to maximize learning capabilities.
  ▪ Understand the balance between developmental limits and parental expectations (i.e. 2 year-old children cannot be taught how to read, but their language development can be enhanced by reading to them).

Factors that Impact Child Dev
► Cognitive development → Piaget’s model
  1. Sensorimotor (0-2 years)
  2. Preoperational (2-7 years)
  3. Concrete Operations (7-11 years)
  4. Formal Operations (12+ years)
► Important concepts within Piaget’s model
  ▪ Schemes: Mental model of the world that we use to represent, organize, and interpret our experiences.
  ▪ Assimilation: Integrating new experiences into an existing scheme.
  ▪ Accommodation: Changing or modifying a scheme to incorporate a new experience.

Sensorimotor Stage (0-2 years)
► Infant’s world consists of the immediate environment
► Interact and learn by sensory input (hearing, feeling, seeing) with motor capabilities.
► Gradually learn to control their own bodies and objects in the external world.
► The ultimate task at this stage is to achieve the sense that objects go on existing even when we cannot see them (Object Constancy/Permanence).

Preoperational Stage (2-6/7 years)
► Developing ability to manipulate images and symbols, especially language.
► Play becomes key in learning. Begin to see use of symbolism in pretend play (e.g. Use a broomstick as a “horsey”)
► Child’s view of the world is egocentric.
► Logical organization of thoughts remains undeveloped (e.g. unable to apply principles of conservation)

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Concrete Operations (6/7-12 Years)
- Perform logical operations, but only in relation to concrete objects, not abstract ideas.
- Basic math skills developed (counting, addition, subtraction) as well as an understanding of conservation.
- Can sort items into categories, reverse the direction of their thinking, and think about two concepts simultaneously.
- Able to understand a situation from another person’s perspective.
- Example: http://www.youtube.com/watch?v=YJyuy4B2aKU

Formal Operations (12+ years)
- Begin to think logically and abstractly, including speculations about what might happen in the future.
- Theoretical, philosophical, and scientific reasoning becomes possible.
- Abstract concepts and moral values become as important as concrete objects.
- With these newly developed thinking abilities, adolescents begin to reinterpret and revise their knowledge base.
- Example: http://www.youtube.com/watch?v=lw36PpYPPZM

Factors that Impact Child Dev
- Psychosocial development → Erikson’s model
  1. Infancy (birth to 18 months)
  2. Toddler (18 months to 3 years)
  3. Preschool (3 to 5 years)
  4. School age (5 years to teens)
  5. Adolescence (teens to 20's)
  6. Young adulthood (20's to 40 years)
  7. Middle adulthood (40 to 60 years)
  8. Late adulthood (from 60 years)

Trust Vs. Mistrust (0-1 Year)
- Description: Infants depend on others to meet their basic needs, and therefore must be able to blindly trust the caregivers to provide them.
- Positive outcome: If their needs are met consistently and responsively, infants will learn to trust their environment and people in it.
- Negative outcome: If needs are not responsibly met, infant may view world as a dangerous and unreliable place.

Autonomy Vs. Shame/Doubt (1-2 Years)
- Description: Toddlers learn to explore and do things for themselves. Their self-control and self-confidence begin to develop at this stage.
- Positive outcome: If child is encouraged to explore and reassured when mistakes are made, he/she will develop confidence needed to cope with future situations that require choice, control, and independence.
- Negative outcome: If parents are overprotective or extremely critical, child may feel ashamed of behaviors and doubt his/her abilities and.

Initiative Vs. Guilt (2-6 Years)
- Description: Children begin to interact with environment in more “adult like” manner as motor and language skills develop. They learn to maintain an eagerness for adventure and play, while learning to control impulsive behavior.
- Positive outcome: If parents are encouraging, but consistent in discipline, children will learn to accept concept of right/wrong without guilt, and not feel shame when using their imagination and engaging in fantasy play.
- Negative outcome: If not, children may develop a sense of guilt and may come to believe that it is wrong to be independent.
Competence/Industry Vs. Inferiority (6-12 Years)
► **Description:** School is the important event at this stage. Children learn to master basic social and academic skills. Peers become the key social agent and children begin to compare themselves with others outside of the family.
► **Positive outcome:** If children can find pleasure in learning, being productive, and seeking success, they will develop a sense of competence.
► **Negative outcome:** If not, they will develop feelings of inferiority.

Identity Vs. Role Confusion (12-20 Years)
► **Description:** This is the crossroad between childhood and maturity when adolescents ask "Who am I?" The key social agent is the person's society of peers.
► **Positive outcome:** Adolescents who solve this conflict successfully will develop a strong identity, and will be ready to plan for the future.
► **Negative outcome:** If not, the adolescent will sink into confusion, unable to make decisions and choices about his/her role in life.

Developmental Disability*
► Severe chronic disability
► Is manifested before the person attains age 22
► Is likely to continue indefinitely
► Results in substantial functional limitations in 3 or more of the following areas of major life activity:
  - Self-care
  - Receptive and expressive language
  - Learning
  - Mobility
  - Self-direction
  - Capacity for independent living
  - Economic self-sufficiency
► **Is attributable to a mental or physical impairment or a combination of the two**

Developmental Delay
► 40% delay in one or 25% delays in 2 or more areas: gross motor, fine motor, cognition, speech/language, personal/social, or activities of daily living
► Global delay: significant delay in 2 or more developmental domains
► 15-18% of children in the U.S.
► Common clinical problem in pediatrics (prevalence of 15-20%)
► Relative increase over the past 2 decades
  - More use of immunizations and antibiotics
  - Parents awareness and concerns
  - Availability of free developmental programs for referral
  - Improvement of the survival rate in infants w. problem

ASD (Autistic Spectrum Disorder)
► **Major impairments** ([http://www.youtube.com/watch?v=FDMMwG7RfFQ](http://www.youtube.com/watch?v=FDMMwG7RfFQ))
  - Social Skills/Relationships
  - Communication
  - Stereotypical Behaviors
  - Desire for Sameness
► 1970’s: 2-3 per 10,000
► 2007: 1 per 150 (U.S.); 1 per 58 (U.K.)
► In the U.S., affects 1 in 80 boys, 4:1 boy:girl
► In California (which has best statistics), ASD now accounts for 45% of all new developmental disabilities
► Increased incidence is partly due to better awareness/diagnosis, but that is only modest effect (per study by MIND Institute)

ASD (Autistic Spectrum Disorder)
► **Genetic?**
  - Co-occurrence is 40-80% in identical twins
  - 5-10% chance siblings of ASD children will have ASD
► **Environment?**
  - High levels of heavy metals (e.g., mercury, lead, aluminum)
  - Excessive oral antibiotic usage
  - Vaccine damage (especially MMR)
  - Exposure to pesticides
  - Lack of essential minerals (iodine, lithium)
► Increased incidence is not due to genetics – gene pool changes slowly
► Environmental factor is more often blamed for increased incidence
Full Syndrome: at least 2 of:
1. Marked impairments in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body posture, and gestures to regulate social interaction
2. Failure to develop peer relationships appropriate to developmental level
3. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people, (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)
4. Lack of social or emotional reciprocity (e.g.: not actively participating in simple social play or games, preferring solitary activities, or involving others in activities only as tools)

Full Syndrome: at least 1 of:
1. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
2. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
3. Stereotyped and repetitive use of language or idiosyncratic language
4. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

Full Syndrome: at least 1 of:
1. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
2. Apparently inflexible adherence to specific, nonfunctional routines or rituals
3. Stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole body movements)
4. Persistent preoccupation with parts of objects
5. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years:
   a) social interaction
   b) language as used in social communication
   c) symbolic or imaginative play