



Human Neuro-Development Lab

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Prenatal human development






พัฒนาการของมนุษย์

Human Development in Life Span




Infant Perception of Objects and the Physical World



Infant Vision

- ❖ At birth the basic anatomical elements of the visual system are present but,
 - ❖ They are neither fully developed,
 - ❖ The lens is immature; images on the retina are blurred
 - ❖ Nor well coordinated
 - ❖ Movements of both eyes don't yet form a clear composite image
- ❖ Neural pathways relaying info from the retina to the brain are immature



- ❖ Color perception
 - ❖ Newborns seem to possess all, or nearly all, of the physiological prerequisites for seeing color
 - ❖ Psychologists disagree about precisely which colors newborns can perceive (Bornstein, 1976)
 - ❖ By 2 mos of age, color vision appears to be roughly equal to adults' (Bornstein, 1988)

❖ Visual Acuity

- ❖ Neonates are extremely nearsighted
 - ❖ Estimates range from 20/300 vision (Fantz, et al., 1962)
 - ❖ 20/660 (Courage & Adams, 1990)
 - ❖ 20/800 vision (Cornell & McDonnell, 1986)
 - ❖ Probably not too problematic because others navigate their world for them at first
 - ❖ Their vision seems to be particularly suited for seeing their mother's face when they are breastfeeding (Stern, 1977)
- ❖ By 7-8 mos (when infants are able to crawl) their visual acuity is close to adult levels (Haith, 1990)

❖ Visual Scanning

- ❖ Newborns actively scan their surroundings (Bronson, 1991)
- ❖ Haith, et al. (1970) determined that neonates scan even in a completely darkened room
 - ❖ This sort of scanning is not related to the visual environment
 - ❖ Must originate in the neural activity of the CNS
 - ❖ May be an initial, primitive basis for looking behavior
- ❖ Haith and his colleagues also found that infants exhibit looking that is related to the external environment
 - ❖ When they scan a room, they stop at an object or some change in brightness
 - ❖ This early sensitivity to changes in illumination, which often signals edges and angles of objects, appears to be an important component of the developing ability to perceive visual forms (Haith, 1980)

Using Vision to Learn about the World

❖ Depth Perception

- ❖ Motion (used in the first months of life)
 - ❖ Visual expansion (as objects approach they fill a larger area of visual field)
 - ❖ Infants blink their eyes defensively when an object is moved toward their face as if it's going to hit (Náñez & Yonas, 1994)
 - ❖ Motion parallax (driving with mountains on side)
 - ❖ Occlusion
- ❖ Pictorial depth cues (not used until 6-7 mos)
 - ❖ Relative size
 - ❖ Texture
 - ❖ Interposition (like occlusion, but stationary)

Visual Cliff (Gibson & Walk, 1960)

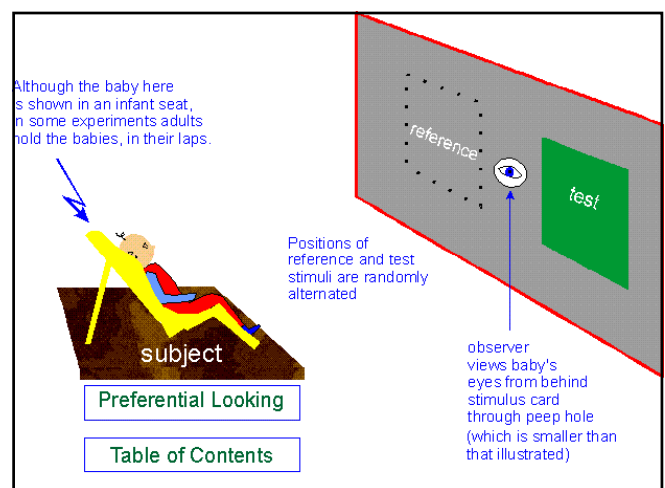
❖ Mothers beckon babies to crawl across

- ❖ 7-mo-old crawlers refuse
- ❖ 7-mo-old non-crawlers agree
- ❖ Self-generated motion seems to be the key
 - ❖ Requires continuous updating of orientation (Bertenthal, et al. 1994)



Measuring Infant Perception

- ❖ Habituation-Dishabituation Paradigms
- ❖ Preferential Looking Paradigms
 - ❖ Both methods capitalize on infants propensity to turn their heads toward interesting stimuli



Example of How the Habituation–Dishabituation Sequence Can Be Used to Study Infant Perception and Cognition

Phase 1

Phase 2

What do infants like to look at?

- ❖ Moderately stimulating objects
 - ❖ Very bright object, moderately bright object, very dim object (Lewkowicz & Turkewitz, 1981)
 - ❖ Loud noise then VBO, MBO, VDO
- ❖ Moderately complex objects
 - ❖ Changes as child develops
 - ❖ Moderate-discrepancy hypothesis (Greenberg & O'Donnell, 1972)
 - ❖ 3-week-olds like 2x2 checkerboards
 - ❖ 14-week-olds like 8x8 checkerboards
 - ❖ 4-month-olds initially preferred 2x2, but after repeated ex. Liked 24x24
 - ❖ People may orient toward material that is just beyond current knowledge

Perception of Faces

- ❖ Fantz (1961, 1963) found that neonates preferred patterned figures, such as faces over plain stimuli
- ❖ Infants made the distinction between a correct schematic face and when the elements of the face were scrambled

Faces that Infants Prefer

- ❖ Mom (Bushnell, et al., 1989)
- ❖ Attractive faces (Rubenstein, Langlois, & Kalakanis, 1999).

(a)

ทารกแรกเกิดรับรู้และเลียนแบบได้

FIGURE 5.9
 Photographs from two of the first studies of newborn imitation. Those on the left show 2- to 3-week-old infants imitating tongue protrusion (a), and mouth opening (b). The one on the right shows a 2-day-old infant imitating a sad (c) adult facial expression. (From A. N. Meltzoff & M. K. Moore, 1977, "Imitation of Facial and Manual Gestures by Human Neonates," *Science*, 198, p. 75; and T. M. Field et al., 1992, "Discrimination and Imitation of Facial Expressions by Neonates," *Science*, 218, p. 180. Copyright 1977 and 1982, respectively, by the AAAS. Reprinted by permission.)

Language Acquisition & Communication

- ❖ Neonatal perception and imitation ability
- ❖ Person-oriented procedures revealed imitation of sounds and movement
- ❖ Talking with, reading, story telling to enhance language development

Face to face interaction



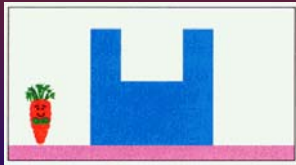
Foundation of Inter-personal Relationship

Infant Object Knowledge

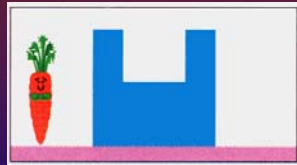
- ❖ Object permanence (Baillargeon & DeVos, 1991)



Thank you Dr. Chris Lalonde for the following animations



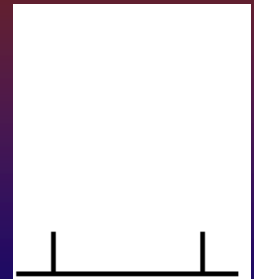
Possible event



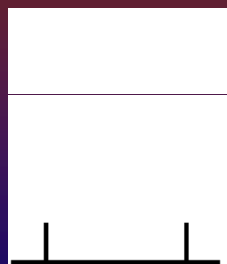
Impossible event

Spelke (1991)

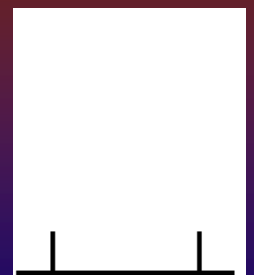
- ❖ **Familiarization:**
 - ❖ a screen is lowered to hide a portion of the display
 - ❖ a ball is then dropped behind the screen
 - ❖ the screen is raised
 - ❖ the ball is seen resting on the floor of the display
 - ❖ looking time to the event is measured

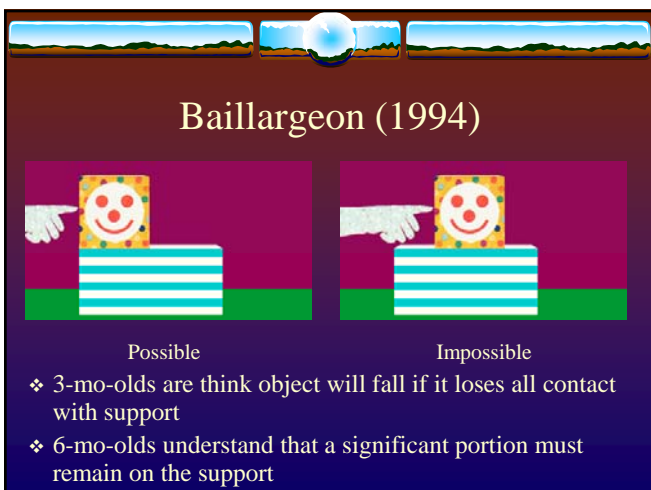
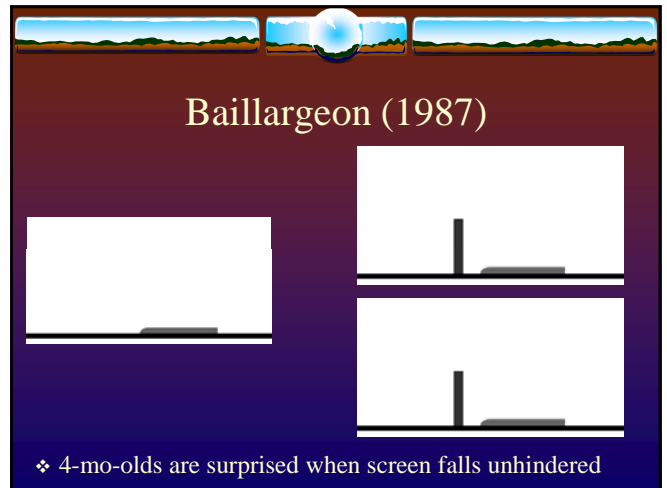
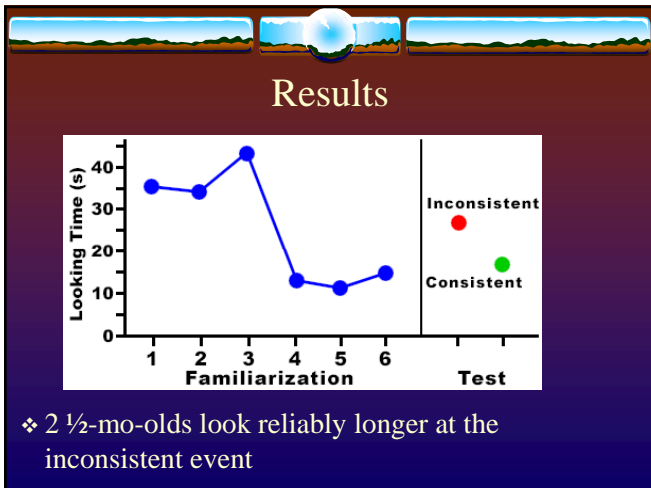
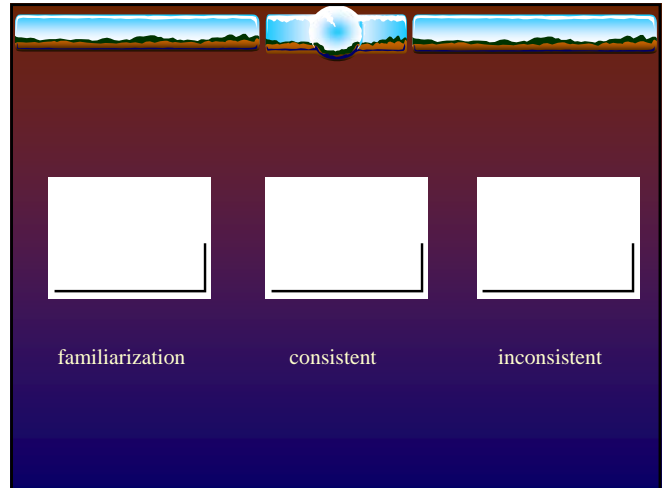
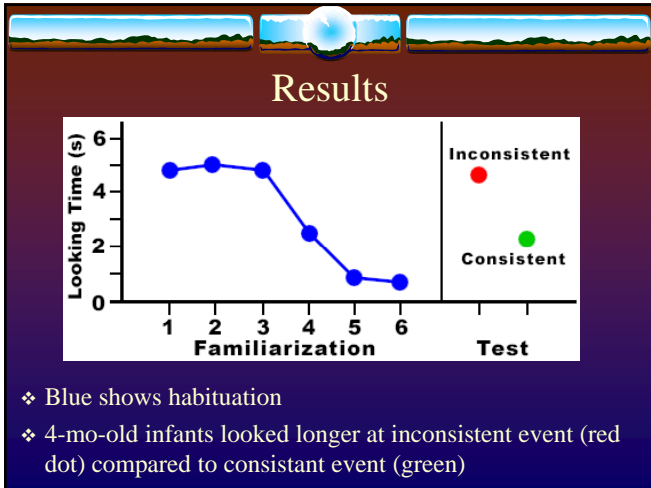


- ❖ **Consistent:**
 - ❖ a platform is added above the floor
 - ❖ the screen is lowered to hide both surfaces
 - ❖ a ball is then dropped behind the screen
 - ❖ the screen is raised
 - ❖ the ball is seen resting on the raised platform
 - ❖ looking time to the event is measured






- ❖ **Inconsistent:**
 - ❖ a platform is added above the floor
 - ❖ the screen is lowered to hide both surfaces
 - ❖ a ball is then dropped behind the screen
 - ❖ the screen is raised
 - ❖ **the ball is seen resting on the floor**
 - ❖ looking time to the event is measured










Pencil grip and drawing

COPY VS IMITATE

INTELLIGENCE



- ❖ How would you define intelligence?
- ❖ How does someone demonstrate intelligence?

Dr. Howard Gardner

What are the Multiple Intelligences?

- ❖ Logical-mathematical ❖ Intrapersonal
- ❖ Interpersonal ❖ Verbal-Linguistic
- ❖ Spatial ❖ Bodily-Kinesthetic
- ❖ Musical-Rhythmic ❖ Naturalistic

Theory of Multiple Intelligence



- ❖ Change in traditional thinking of

How smart are you?
 to
 How are you smart?
- ❖ Viewing reality through various windows

Logical-Mathematical

Ability to discern logical or numerical patterns

- ❖ prefers finding patterns, solving problems
- ❖ in the classroom: comparing and contrasting, classifying ideas
- ❖ in the workplace: banking, astronomy, computer programming, accounting, inventing

แบบสำรวจพหุปัญญาสำหรับเด็กอนุบาลถึงประถมศึกษาปีที่ ๑

ถามว่าถ้าหนูเลือกได้ หนูจะอยากทำอะไร:

- ? หนูเลือกเขียนแต่งเรื่องนิทาน หรือ เล่นเกมส์ที่หาทางออกจากเขาวงกต
Word ภาษา VS Math/ Logic คณิตศาสตร์/ตรรกะ
- ? หนูชอบทำงานตามลำพังคนเดียว หรือชอบทำเป็นกลุ่มหลายคน
Selfตนเอง VS People มนุษย์สัมพันธ์
- ? หนูเลือกอ่านหนังสือ หรือออกไปตกปลา
Word ภาษา VS Natureธรรมชาติ
- ? หนูชอบวาดรูปหรือชอบอ่านหนังสือ
Picture/ Spatial ภาพ/มิติสัมพันธ์ VS Word ภาษา

รวบรวมผล:

ปัญญาด้านต่างๆ บันทึกผลเป็นความถี่

1. Math/ Logic คณิตศาสตร์/ตรรกะ.....
2. Picture/ Spatial ภาพ/มิติสัมพันธ์.....
3. Body การเคลื่อนไหว ร่างกาย/กีฬา.....
4. Musicดนตรี.....
5. Word ภาษา.....
6. People/ Group มนุษย์สัมพันธ์.....
7. Self รู้ตนเอง.....
8. Nature ธรรมชาติ.....

แนวโน้มของด้านที่เด็กชอบ หรือแสดงความสนใจ

ลำดับที่	ปัญญา	บันทึกความถี่
1		
2		
3		
4		
5		
6		
7		
8		

Dr. Gardner believes

- ❖ Who have difficulty reaching students in one way of instruction should try another way.
- ❖ Should design lessons using a variety of instructional strategies incorporating these intelligences.
- ❖ Should use a variety of assessments so children can show what they know using their multiple intelligences.

