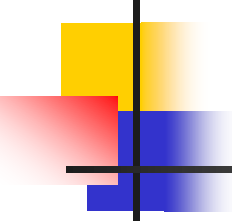




# Evolutionary aspects of mother infant relationship

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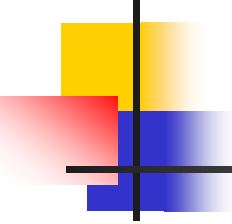
M Maldonado



# Pregnancy as a competition between fetus and mother?

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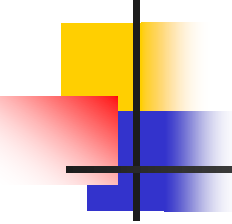
- There is an immunosuppression reaction toward the products of conception
- The baby is “outside” the mother’s body
- The fetus/placenta are accepted by mother’s immune system as “temporary self”
- Nausea might contribute to lesser exposure to possibly toxic or dangerous substances



# Pregnancy as a competition between fetus and mother?

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- The blood of the mother and fetus do not mix
- However, there is some mutual exposure to antigens
- There is a “microchimerism” during the pregnancy, i.e. fetal cells in mother’s blood and mother’s cells in fetal blood
-



# Pregnancy as a competition between fetus and mother?

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- The fetus tries to obtain as much nutrition from his mother as possible
- The mother's body tries to "economize" the nutritional expenditure of pregnancy
- There is a "contradiction" of interests between them

Maternal behavior. Is there a  
“maternal instinct”?



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# What is the basis of maternal behavior?



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- Does it have an evolutionary basis?
- Does it have a neuro-hormonal representation?
- Is it also a learned behavior?
- i.e. does it depend on early experiences of care?



# Maternal behavior

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- Maternal behavior as animal behavior
- Newborn behavior as animal behavior
- “first encounter” between mother and baby
- Klaus and Kennel emphasize “bonding” experience. Leaving the mother and infant in peace, without excessive interference



# Maternal and infant behavior

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- Possible role of oxytocin (and maybe cortisol) around the time and birth and afterwards
- Leading to a feeling of tenderness and love for the baby
- (or failure of maternal to infant attachment. Kumar)



# Role of oxytocin

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- Oxytocin as the hormone of “trust”
- Promotes filial behavior or social behavior
- Diminishes anxiety about social encounters

# Maternal and infant behavior: Feeding



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- With the cry of the baby there is a “letdown” of milk into the breast
- Infant sucking promotes production of colostrum and more milk
- The baby is “programmed” to look for breast shortly after birth

# Maternal and infant behavior: Feeding



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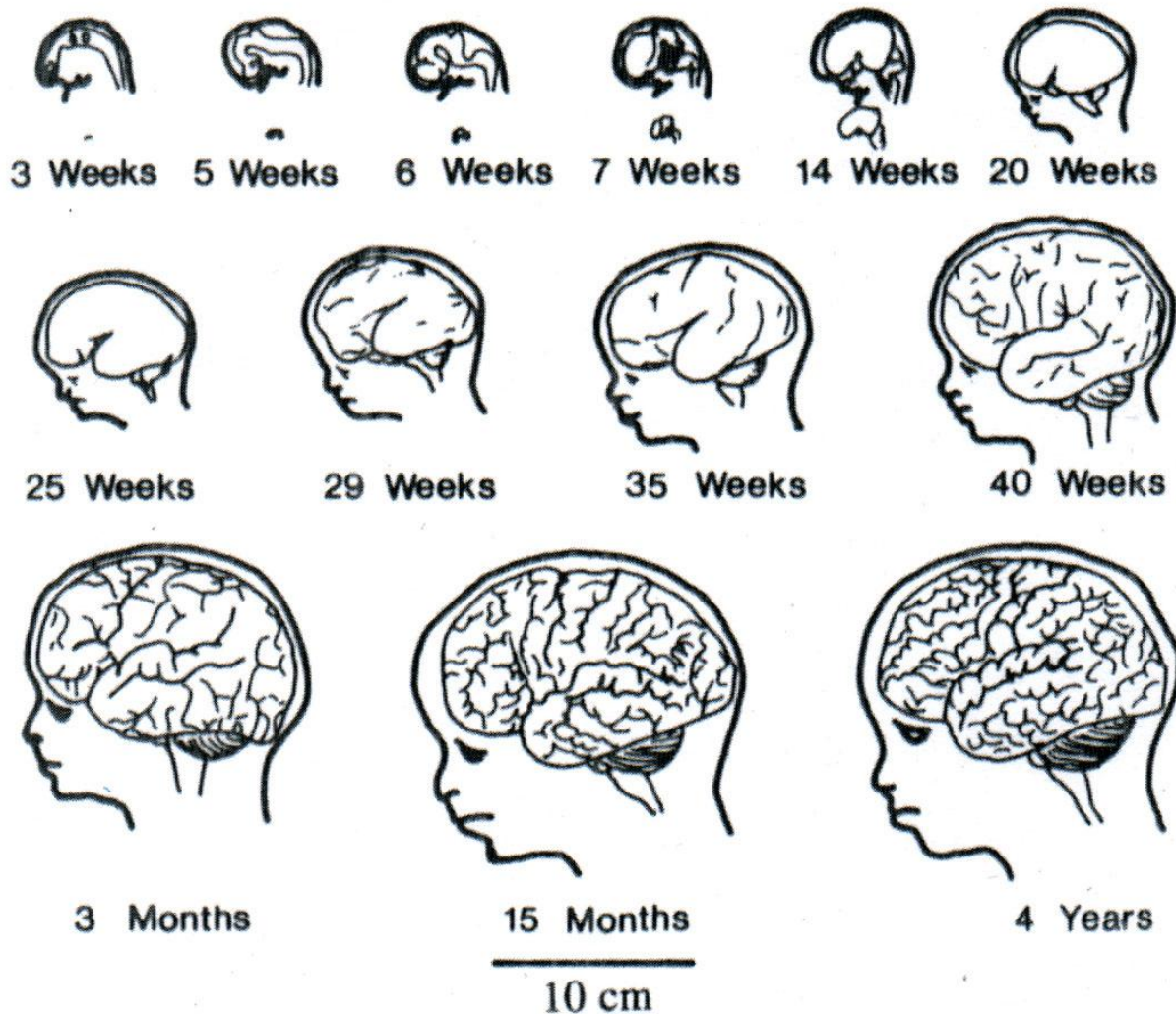
- Baby is oriented toward breast by odor of areola (and possibly of amniotic fluid).
- Baby is capable of 'swimming' toward mother's chest and "finding" breast by rooting. He "massages" the breast and Then starts suckling



# Maternal and infant behavior: Feeding

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- Human milk is relatively diluted
- Low in fat contents compared with other mammalian milks
- Baby has to feed frequently in order to maintain weight gain (triplicates weight in one year)
- Baby is a “feeding machine”



**Figure 6.5** Morphological development of the human brain. These schematic drawings depict the external surface of the brain at a succession of embryonic, fetal, and early postnatal



# Maternal and infant behavior: Feeding

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- Breastfeeding promotes less postpartum bleeding in the mother
- Breastfeeding promotes weight control in mother \*cost of feeding
- Breastfeeding promotes bonding, skin to skin contact with mother and mutual relaxation



# Maternal behavior: holding

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- Most mothers, regardless of handedness, hold their baby on the left side
- Theories:
- The baby is soothed by the sound of the heart he heard in utero

# Maternal and infant behavior: Holding



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- The left side of the face is “more expressive” than the right
- The hearing of infant cries is processed in the right hemisphere of the mother’s brain, leading to sensitivity and tenderness
- Right hand is left “free”



# Maternal and infant behavior: communication

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- Neonate has preference for faces over other stimuli
- The baby can distinguish three blobs
- The newborn recognizes the mother by scanning eyes, eyebrow to hair line distance and contour of hair



# Maternal and infant behavior: communication

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- Newborn emits “distress calls” when he is left alone, sonographically distinct from hunger cries, pain cries, etc.
- Mother is “programmed” to respond to cries by holding and soothing, skin to skin contact



# Maternal and infant behavior: communication

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- Crying behavior.
- Newborns left in contact with their mother cry much less than babies separated from their mother
- Less incidence of hypothermia and distress in infant.

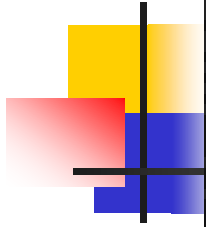
# Maternal and infant behavior: communication



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- Mother “presents” her face at approximately 20 cms of infant’s face
- Mother exhibits “greeting behavior” toward face: lift eyebrows, eyebrow flashing, raising tone of voice (best perceived by newborn)
- Talking in “motherese” (simpler syllables)







# Effects of early experience

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- Early experiences of deprivation produce relative deficit of oxytocin and vasopresin in the child
- “traces” of early deprivation
- Possible less capacity for trust and relaxation



# Cooperative Breeding

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- Many birds and mammals engage in cooperative breeding (Hrdy, 2005)
- Cooperative breeding means the participation of “allo-mothers” in the care of the infant
- This promotes the survival of the infant and relieves the mother of burden of care



# Cooperative breeding

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- Common in many primates
- “aunts”, other relatives and females try to help care for the infant
- E.g. holding, giving “baby food”, protecting
- Females are “seduced” by the baby
- Males can be primed to care for infants



# Cooperative breeding

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- Promotes very “expensive” childhoods
- i.e. prolonged marked dependency by the baby
- Much longer time to develop into self sufficiency
- If help is not available the mother may feel overwhelmed



# Cooperative breeding

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- If support not available
- Higher rates of infanticide and infant abandonment
- Humans have a relatively higher rate