Human Infant Biology And Its Relationship To Parental Caregiving: *Western Constraints On Creating a “Fairest Love”*

“Don’t sleep with your baby or put the baby down in an adult bed. The only safe place for a baby to sleep is in a crib that meets current safety standards and has a firm tight-fitting mattress.”

Pediatric Review

Infant-Parent Co-Sleeping in an Evolutionary Perspective: Implications for Understanding Infant Sleep Development and the Sudden Infant Death Syndrome

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Sleep, 100:363-282 © 1993 American Sleep Disorders Association and Sleep Research Society

Maternal Sleep and Arousals During Bedsharing With Infants

S. Mosko, C. Richard and J. McKenna

Bedsharing Promotes Breastfeeding.

James J. McKenna, PhD†, Sarah S. Mosko, PhD‡ and Christopher A. Richard, PhD‡;

PEDIATRICS Vol. 100 No. 5 November 1997

New knowledge, new insights, and new recommendations

Scientific controversy and media hype in unexpected infant deaths

www.medicaldaily.com

Infant Arousals During Mother-Infant Bed Sharing: Implications for Infant Sleep and Sudden Infant Death Syndrome Research

Sarah Mosko, PhD*, Christopher Richard, PhD‡; and James McKenna, PhD‡

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Sleeping With Baby: An Internet-Based Sampling of Parental Experiences, Choices, Perceptions, and Interpretations in a Western Industrialized Context

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The “fairest” love ...?

the most selfless love we will ever know..?

that of our mothers..

and fathers
Until recent historic periods in the western industrialized world

- No human infants were ever separated from their caregivers…
  - most human infants know only constant contact, exclusive breastfeeding and proximity, made necessary by the infants extreme neurological immaturity, lack of ambulatory abilities, and need for frequent breastfeeding both day and night;
For the human infant its “fairest love” begins through its bodily-sensory experiences….

with its capacity to experience love encountered first through external regulation by the mother of its fundamental physiology..feelings and sensations that provide the scaffolding of all that will become meaningful socially…cognitively, emotionally, and psychologically….

For the human infant ….contact with another body IS love..in the most profound and scientific sense..nutrition, transportation, immunity, body warmth, calorie absorption, hormonal levels, heart rate, sleep architecture, neuronal proliferation
DOES THE HUMAN INFANT EVEN EXIST APART FROM ITS MOTHER?

• “There is no such thing as a baby, there is a baby and someone”. D. Winnecutt?

• “For species such as primates the mother IS the environment.” Sarah Blaffer Hrdy.?
Until recent, western historic periods, no human parents ever asked:

Where will my baby sleep, how will I lay my baby down to sleep, and how will I feed my baby?

How will I care for my baby?

(most human parents still don’t!)
And, yet....

- Culture by way of values and ideologies... changes much faster than does human infant biology and the caregiving practices thought best to serve the contemporary, western infant well...in fact.....
Although the biology of infancy is universal in historic time, human perceptions of infancy and what is required to care for them are socially constructed and subject to historical change (after Sussman 1982)
“In the western world it is perhaps a great advantage for an infant to have a sensitive skin or diaper rash or some other dermatological disorder, for then, at least, it can be assured of receiving something resembling an adequate amount of cutaneous stimulation” (Montagu :1986:247)
The western infant is *disarticulated* from the mother’s body… What are the deleterious consequences? Does it help to explain SIDS?

- No touch;
- No smells;
- No sounds
- No movement;
- No body heat
- No breadth exchange
- No maternal physiological regulation
Changing concepts related to where babies can or should sleep...the beat goes on...

(1976, 1999)
“...Sleeping in your bed can make an infant confused and anxious rather than relaxed and reassured. Even a toddler may find this repeated experience overly stimulating”

(2006)
“Children do not grow up insecure just because they sleep alone or with other siblings, away from their parents; and they are not prevented from learning to separate, or from developing their own sense of individuality simply because they sleep with their parents” (Ferber 2006:41).
Dr. Richard Ferber “changes his mind”..?? But the larger and more important question is…What is it about our culture that makes us care, or makes it important what someone who has no familiarity with our baby or our family thinks about this very personal issue?

• “If you find that you actually prefer to to sleep with your baby you should consider your own feelings very carefully”.

• “Whatever you want to do, whatever you feel comfortable doing, is the right thing to do, as longs as it works….. most problems can be solved regardless of the philosophical approach chosen” (Ferber: 2006: 41)
“Babies should be trained from their earliest days to sleep regularly and should never be woken in the night for feeding....”

“Baby should be given his own bedroom from the very beginning. He should never be brought into the living room at night”
Changing perceptions....of what’s good for baby...

“The constant handling of an infant is not good for him. The less he is lifted, held and passed from one pair of hands to another, the better, as while he is young his bones are soft and constant handling does not tend to improve their development nor the shapeliness of his little body. the newborn infant should spend the greater portion of his life on the bed”

FROM: THE BABY
MARIANNA WHEELER 1901
HARPER BROS: NEW YORK LONDON
And the most bizarre… touchless care

“If you’ve ever wished for a “hand” to leave behind so that your baby would feel as if you’ve never left the room, your prayers have been answered with the Zaky Infant Pillow”.
Present medical-cultural milieu:

warn mothers about what their bodies can do TO their infants, rather than FOR their babies, to protect and nurture them.

• “Babies Sleep Safest Alone.”
  – New York State Public Health Campaign

• “For you to rest easy, your baby must rest alone.”

• “We know the value of holding your child, cuddling your child, loving your child. But if you take the baby to bed with you and fall asleep, you are committing a potentially lethal act”
  – Deanne Tilton Durfee, Director of the Los Angeles County Inter-Agency Council on Child Abuse and Neglect. Los Angeles Times 4/24/08.
Historical Forces Effected Western Infancy and How We Conceptualize Infant Development

- rise of child care experts replace maternal confidence
- emphasis on technology, rather than on bodies to nurture;
- emphasis on “average expectable outcomes” per any given behavioral parenting strategy..one-size-should-fit all;
- emphasis on social values and ideologies (not biology) to guide research and conclusions..medical care of infants;
- social constructions of infancy, not /biological evolutionary; inortance of individualis, autonomy, separation, self-sufficiency
- “Science” of infant feeding (bottle-formula feeding) and sleep pediatrics became one and the same with…
- mutually reinforcing moral ideas about who infant should be, or become, rather than who they are…and how husbands and wives should relate vis a vis distance, authority and separation from children…also, touch =sex?
Technology  Vs.  Human Body
Slippage from perceived medical-health “good”--to perceived moral good..

if...sleeping alone, through the night is “good” for babies

then “good” babies, do so?
When up, is not up, and when down is not down.. i.e. when what is biologically “good” for infants is conceptualized as “bad”, what is “normal” is considered “abnormal”, when infant “adaptive” responses are interpreted as “deficiencies”

Solitary Infant sleep (separation and autonomy) is “good”

Social, infant “co-sleeping” (interdependence) is bad
A mother held her new baby and very slowly rocked him back and forth, back and forth, back and forth. And while she held him, she sang;

I’ll love you forever
I’ll like you for always,
As long as I’m living
My baby you’ll be.
...But at night when that teenager was asleep, the mother opened the door to his room, crawled across the floor and looked up over the side of the bed. If he was really asleep she picked up that great big boy and rocked him back and forth, back and forth, back and forth. While she rocked him she sang”

“I’ll love you forever,
I’ll like you for always,
As long as I’m living
‘My baby you’ll be
"Scientific" validation of solitary infant sleep as "normal" and "healthy"

#1: Initial test condition—infant sleeps alone, is bottle fed, and has little or no parental contact

#2: Derive measurements of infant sleep under these conditions

#3: Repeat measurements across ages, creating an "infant sleep model"

#4: Publish clinical model on what constitutes desirable, healthy infant sleep.

#5: To produce "healthy" infant sleep, replicate the test condition
Who needs Biology?
Does It Matter

is this what we mean when we say.....

“a good taste in art”?  

Babies And Mothers
Sleeping and
Breastfeeding (Together)

• Lighter sleep
• Diverse Sleep
• Longer Sleep In Minutes
• Enriched with Much Breastfeeding
• Sensory Exchanges
• Fragrances
• Movements
• Vocalizations
• Physiological Unpredictability For Both
• Looking at Each Other
• Positioning In relationship To Each Other
• Arousing and Sleeping in Syncchrony
• Less crying, More Maternal Interventions
Ventral-Ventral mother-infant contact is biologically normative, as is the co-sleeping micro-environment.

Courtesy of Dr. Helen Ball
The parent-infant dyad

- Hofer’s “hidden physiological regulatory effects.”
- Human infants need and expect proximity and contact from caregivers.

Reviewed in McKenna, Ball, and Gettler 2007
American Academy of Pediatrics “Guide To Infant Sleep” Recommends

• “Never let an infant fall asleep at the breast”..

• Really?
The very context within which an infant’s falling asleep evolved…!

(and besides, just try to prevent an infant from falling asleep at the breast!!)
The "dyad" IS the unit of study

Human infant (parental) social care is synonymous with physiological regulation
“For species such as primates, the mother IS the environment.”

Nothing an infant can or cannot do makes sense, except in light of mother’s body

Biology of Mother’s Milk Predicts Mothering Behavior

- **Feed and Park Species (nested)**
  - (Ungulates)
    - High fat
    - High protein
    - Low carbohydrate
  - High calorie = long feeding interval;
    (to avoid predators nested infants do not defecate or cry in mother’s absence)

- **Feed And Carry Species**
  - (Primates—Humans)
    - Low fat
    - Low protein
    - High carbohydrate
  - Low calorie = short feeding interval;
    (“carried” infants cry in mother’s absence and defecate spontaneously)
Consider the physical intimacy of the maternal-infant relationship...socially and medically obscured in Western culture...
At birth the human infant is the least neurologically mature primate of all, and the most reliant on physiological regulation by the caregiver for the longest period of time.
• Rotation of ilium (hip bones) forward and shortening of ischium to support bipedalism
• Concurrent with increased fetal head size to accommodate learning and social dependence
• Results in the human “obstetrical dilemma”
Enter...MORE human biology...

- The human "obstetrical dilemma";

- Human Fetal Head Size Exceeds Outlet Dimensions With Emergence of Bipedalism

Figure 8.1. Relationship of maternal pelvis (dark outlines) and fetal head (solid dark ovals) (after Schultz, 1949).
**Percentage of Adult Brain Size:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Chimpanzee Infant</th>
<th>Human Infant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At Birth</strong></td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>3 months</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>45</td>
</tr>
<tr>
<td>9</td>
<td>65</td>
<td>50</td>
</tr>
<tr>
<td>1 year</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>75</td>
<td>70</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
<td>80</td>
</tr>
<tr>
<td>8-9</td>
<td>100</td>
<td>95</td>
</tr>
</tbody>
</table>

*(100% at 14-17 years)*
Massaged Babies

- gained weight 47% faster (per day),
- were more alert,
- left hospital 6 days earlier than non-treated babies (Field et al 1987)..
- touch stimulates the vagus nerve (to stimulate the gastro-intestinal tract making digestion more efficient;
- facilitates endorphin release reducing stress.. Stress cortisol levels
Negative Effects of Shortterm Mother-Infant Separation (Nonhuman primates)

- immunological compromises (depressed antibody count);
- increased ACTH stress hormones
- cardiac arrhythmias
- breathing irregularities
- depressed body temperature
- sleep patterns disrupted
- behavioral abnormalities (excessive self-stimulation, hyperactivity, anaclitic depression)
Benefits of Contact (Skin-to-Skin) Newborns

- axillary and skin temperatures significantly higher
- blood glucose levels higher; oxygen saturation increased
- less frequent crying, shorter average duration
- preserve glycogen stores
- nursing established earlier, more firmly
- accelerated weight gain
A major basis of maternal-infant attachment is “contact-comfort” (rather than satiation)… *Harry Harlow*

“Attachment”:

Unfolding, discriminating bond between parent and infant; genetically-based…..

Immediate survival and protection from predators is main outcome;
Maternal behavior among primates extends throughout an extremely long infant and juvenile period, with prolonged periods of physical contact.
3-day separation: induces physiological changes (immune, system, heart rate, sleep, cortisol, loss of body temperature..

anaclitic depression:
• hyperactivity
• conservation-withdrawal;
• death or recovery

Figure 7. Mean skin temperature (abdomen) of human neonates given immediate maternal-infant contact (placed on mother's bare chest after cutting the umbilicus) and control neonates (placed in a radiant-heated Kreiselman crib) as a function of time after delivery. Data are replotted from Färdig (1980).
Breathing mechanical Teddy Bear!
(reduces infant apneas by 60%)

(Evelyn Thoman 1985)
“...There would be little if any difficulty exchanging a Cro-Magnon and a modern infant, but great incongruity in making the same switch amongst adults of both cultures.”
Well that mother got older and older. She got older and older. One day she called up her son and said, “you better come see me because I’m very old and sick.” When he came in, the door she tried to sing the song. She sang:

I’ll love you forever,
I’ll like you for always.
But she could not finish because she was too old and sick.
And the fairest loved, becomes the fairest love..

“The son went to his mother. He picked her up and rocked her back and forth, back and forth, back and forth.

-And he sang this song;

I’ll love you forever, I’ll like you for always, As long as I’m living, ‘My Mommy you’ll be’
First Kangaroo (Human) Mom: Drs. Rey and Martinez, Bogota, Columbia 1972

Fig 2—A 1400 g, 32-week gestation “kangaroo” baby.
Infant-parent cosleeping

a generic concept referring to the diverse ways in which a primary caregiver usually the mother sleeps within close proximity (arms reach) of the infant permitting each to detect and respond to a variety of sensory stimuli (sound, movement, smells, sight etc..) emitted by the other

cosleeping is the universal (species-wide) sleeping arrangement
Diversity of Mother-Infant Cosleeping

cosleeping: the universal context of infant sleep development...a generic sleeping arrangement in which mother and infant exchange and have access to each other's sensory modalities (within arms reach)
Dis-articulated from mother...

No touch;
No smells;
No sounds
No movement;
No body heat'
No breadth exchange
Diversity of Co-sleeping
(requires taxonomic distinctions)

Co-bedding twins (within sensory range)

partial, mixed bedsharing with Dad
Parent-infant co-sleeping is biologically and psychologically expectable, if not inevitable.
What Co-sleeping Looks Like

Koala

Maori, New Zealand

napping desert
Aborigine

recliner co-sleeping (unsafe)
Sometimes babies sleep in mother-baby sleep laboratories
Sleep Laboratory Lounge
Studying The Physiology and Nighttime Behavior of Breastfeeding Human Mother-Infant Pairs

Conversing with data across discipline cultures: polysomnography

Why was the first ever physiological study of mothers and infants co-sleeping completed by a biological anthropologist
Where do babies look while co-sleeping and while sleeping alone.
Mother-Infant Mutual Physiological Regulation


Synchronicity of Mother-Infant Sleep and Wake: Percent Simultaneous Activity Time (“SAT” on routine nights)

Infant Arousals Per Group Per Night

Mean Interval Between Feeds (in min) Per Group Per Night
EEG Defined Mother and Infant Arousals

- Infant-induced maternal arousal.

- Maternal-induced infant arousal.
All studies confirm that bedsharing improves and enhances breast feeding (McKenna et al 1997, Ball 2003, Baddock 2006, Young 1999)
Sleep Architecture, Maternal and Infant Arousals Research

Maternal arousals

*Pediatrics* (1998)

Infant Sleep Architecture

*Sleep* (1997)

Co-Sleeping with breast feeding promotes the safer supine infant sleep position

*MATERNAL SLEEP DURING INFANT BESHPARING*

Maternal Sleep Architecture *Sleep* (1997)
Choice of child care "practice" has physiological consequences for infant development

Choice of Routine Sleeping Arrangement

Cosleeping (?) ———— Solitary Sleeping (?)

choice affects:

breastfeeding duration, frequency, infant sleep position, arousal patterns, sleep architecture, maternal inspections, thermal and CO2 environment, infant crying, heart rate and breathing, emotional (interactional) expectations from parent, sensitivity to presence of "other"
Socio-cultural and Historical Factors and Forces Leading to Erroneous Scientific Understandings (Undermining Parental Confidences and Empowerment)

- rise of child care experts using moral judgments as a basis of recommending what infants “need” vs. what is worth “investing in” as an infant care practice.
- belief in superiority of technology, rather than on maternal bodies to stimulate, hold and nurture; view of mothers body as lethal weapon over which neither infant or infant have control.
- emphasis on “average expectable population outcomes” rather than on individual variability or potential. per any given behavioral parenting strategy.
- emphasis on ethnocentric social values and ideologies (not biology) to guide research and conclusions. “Fallacy of medical normalcy” (G. Williams)
- improper medicalization of relational (caregiving) issues. assumed to be best understood by pediatricians (who generally have no training in human social development or human evolution…)
- “Pathologizing” of normal behavior (crying when left alone) as making infants into patients (blaming the victim for the crime) in need of correction when they fail to follow cultural scripts. “Never let a baby fall asleep at the breast” AAP Guidelines For Infant Sleep
- social constructions of infancy, not biological-evolutionary based (influences of Freud, Klein, Watson..psychology in general);
- “Science” of infant feeding (bottle-formula feeding) and sleep pediatrics became one and the same with mutually reinforcing moral ideas about who infant should be, or become, rather than who they are…and how husbands and wives should relate vis a vis distance, authority and separation from children…also, ideologies about the bedroom as a “sexual place.”

- Rise of romantic love. Specialness of “conjugal pair” authority of father, evils of infant original sin and manipulating infant
Richard Ferber, M.D.

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slide courtesy of Meret Keller and Wendy Goldberg