

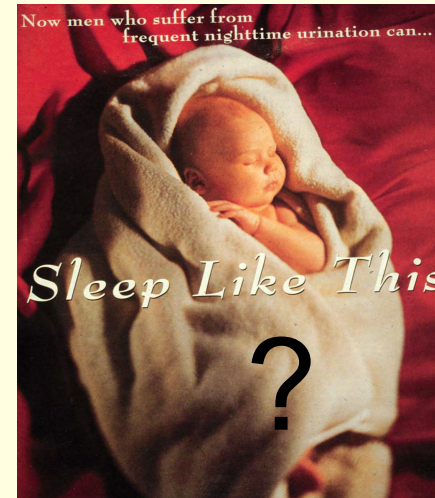
In the western world...Understanding Optimal Infant Care: Scientific and Political Challenges

“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.”

Ann Brown September 29, 1999 to US Media Press Conference.

or

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



Until recent historic periods in the western industrialized world

- *No human (primate) infants were ever separated from their caregivers...nocturnally, or any other time*
 - *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;*
 - *nobody ever asked: where will my baby sleep, how will my baby feed, how will I lay my baby down for sleep*

Present hospital policies warn mothers about what their bodies do *TO* their infants, rather than what their bodies do *FOR* their babies

- “Babies Sleep Safest Alone.”
 - New York State Public Health Campaign
- “For you to rest easy, your baby must rest alone.”
 - Philadelphia Public Health Campaign.
- “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.
 - Mothers body presented as lethal weapon over which neither the the mother nor the infant has control,
 - *nor does mother have the right to to be with her infant, to make her own informed decision*

*Recalling human evolution as a fundamental
beginning point*

Human Infant-Parental Biology..

bipedalism and neurological immaturity, delayed
development, extero-gestation of human infant;

human breast milk composition and breastfeeding
delivery; contact and carrying species

underlying bases of parental motivations to respond to
infant behavioral needs;

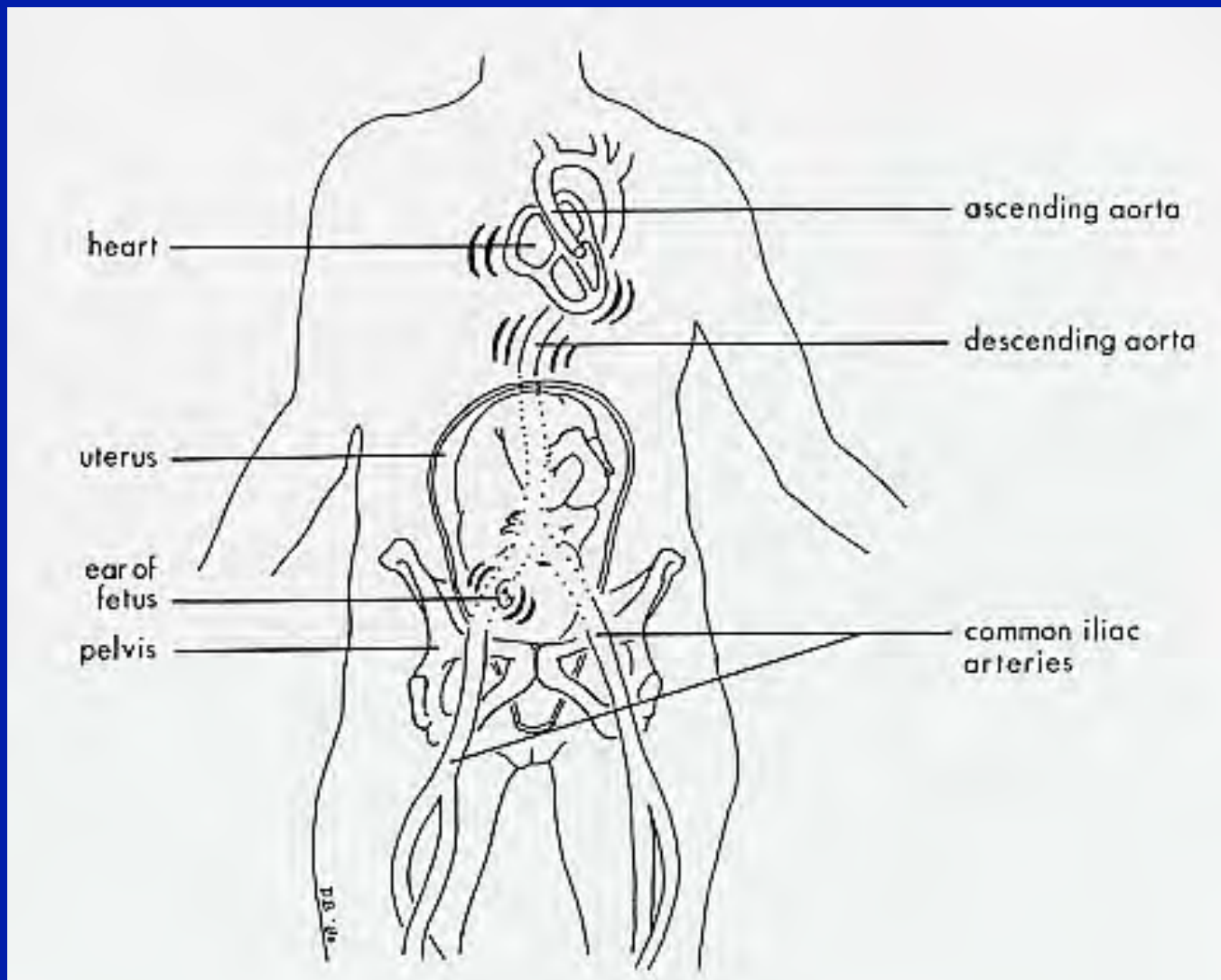
physiologically-based responses by infants to parental
contact;

Biology of Mother's Milk Predicts Mothering Behavior

- **Feed and Leave Species**
 - **(Ungulates)**
 - High fat
 - High protein
 - Low carbohydrate
- High calorie = long feeding interval;
- **Contact, Co-sleeping, And Carry Species**
 - **(Primates—Humans)**
 - Low fat
 - Low protein
 - High carbohydrate
- Low calorie = short feeding interval;

(to avoid predators nested infants do not defecate or cry in mother's absence)

(carried infants cry in mothers absence and defecate spontaneously)



By way of natural selection, the prenatal uterine environment pre-sensitizes the infant to the post-natal maternal micro-environment on which its survival depends..

McKenna (1986). *Med Anth* 10 (1).

Hidden regulatory mechanisms.. calming a baby by “shhhhh..ing”

A universal practice!

- prenatal sensory experiences--fetus hears rhythmic “*shhoosh--sha*” as blood pulses by infant’s ear every .10 of a second following maternal heart contraction..
 - “chamosh (Urdu) “shuu” (Vietnamese)
 - chutee (Serbian), “soos” Armenian
 - Hush-silence (English), “stille” (German),
 - “hushket” (Arabic), “sheket” (Hebrew)
 - “Shuh-shuh” Chinese, “toosst” Swedish

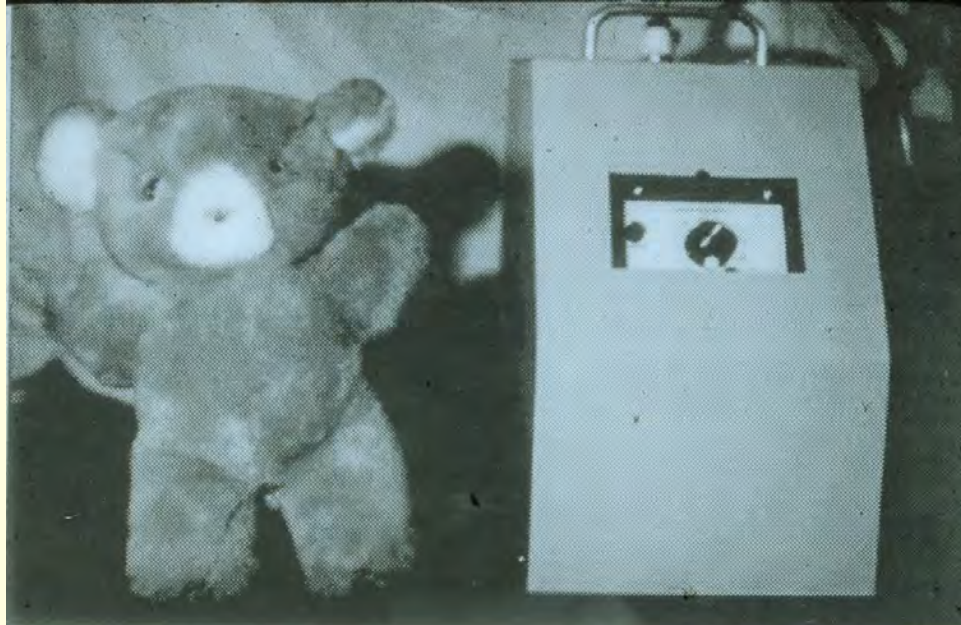
Human infants “extero-gestate” ...?

- Extero-gestation constitutes the continuation of the utero-gestative processes in the environment outside the womb” Montagu 1986:293
- *“For species such as primates the mother is the environment” (Blaffer Hrdy 1999).*
- *The utero-gestate fetus, embraced, supported and rocked within the amniotic environment, as an extero-gestate requires the continued support of his mother, to be held and rocked in her arms, and in close contact with her body, swallowing colostrom and milk in place of amniotic fluid” Montagu 1986 293*

Breathing mechanical Teddy Bear!

(reduces infant apneas
by 60%)

(Evelyn Thoman 1985)



Maternal behavior among primates extends throughout an extremely long infant and juvenile period, with prolonged periods of physical contact.



Orang-Utan



Ventral-Ventral mother-infant contact: is not an example of unsafe sleep



Courtesy of Dr. Helen Ball

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;



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 11 Depressed pigtail infant showing characteristic posture and dejected facies. (From I.C. Kaufman and L.A. Rosenblum, The reaction to separation in infant monkeys: anaclitic depression and conservation-withdrawal. *Psychosom. Med.* 29 (1967), 648-75)

Mimicking and Reflecting Parental Abuse and Neglect

Figure 114 A motherless monkey rejects her own child.
(Courtesy of Wisconsin Regional Primate Research Center.)



Abandonment

Now men who suffer from
frequent nighttime urination can...

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 breath
exchange

No maternal physiological
regulation



Sleep Like This

The articulated...baby...maternal- infant micro-
environment exchanging heat, touch, sound,
movement, CO₂, smells, sight, arousals



HERE
MOTHER
AND BABY

FACE EACH
OTHER
(FEO), AS IS
TYPICAL

*Babyhood.....*by Paul Reiser

“Getting your child to sleep becomes a blinding obsession. I myself would often lose sight of the larger picture. What is the actual goal here? Constant sleep? No awake time? Zero consciousness?

I mean, we must accept that at some point babies have to be awake. They did not come to the planet just to sleep. Are we determined to get them asleep just so we can get a taste of what life was like before we had a kid?

Because, if we are, then why did we have a kid? Just to lie there to look soft and fuzzy? We could have gotten, say, just a peach. A St Bernard? A narcoleptic houseguest?

Or why not just a chenille bathrobe? Chenille bathrobes are fuzzy and just lie there”?

“It’s not what we
know that gets us
into trouble...it’s
what we know...that
just ain’t so!

From: Everybody’s Friend (1874)

Mark Twain

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*)

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

Culture Changes much faster than human, and especially, infant biology..

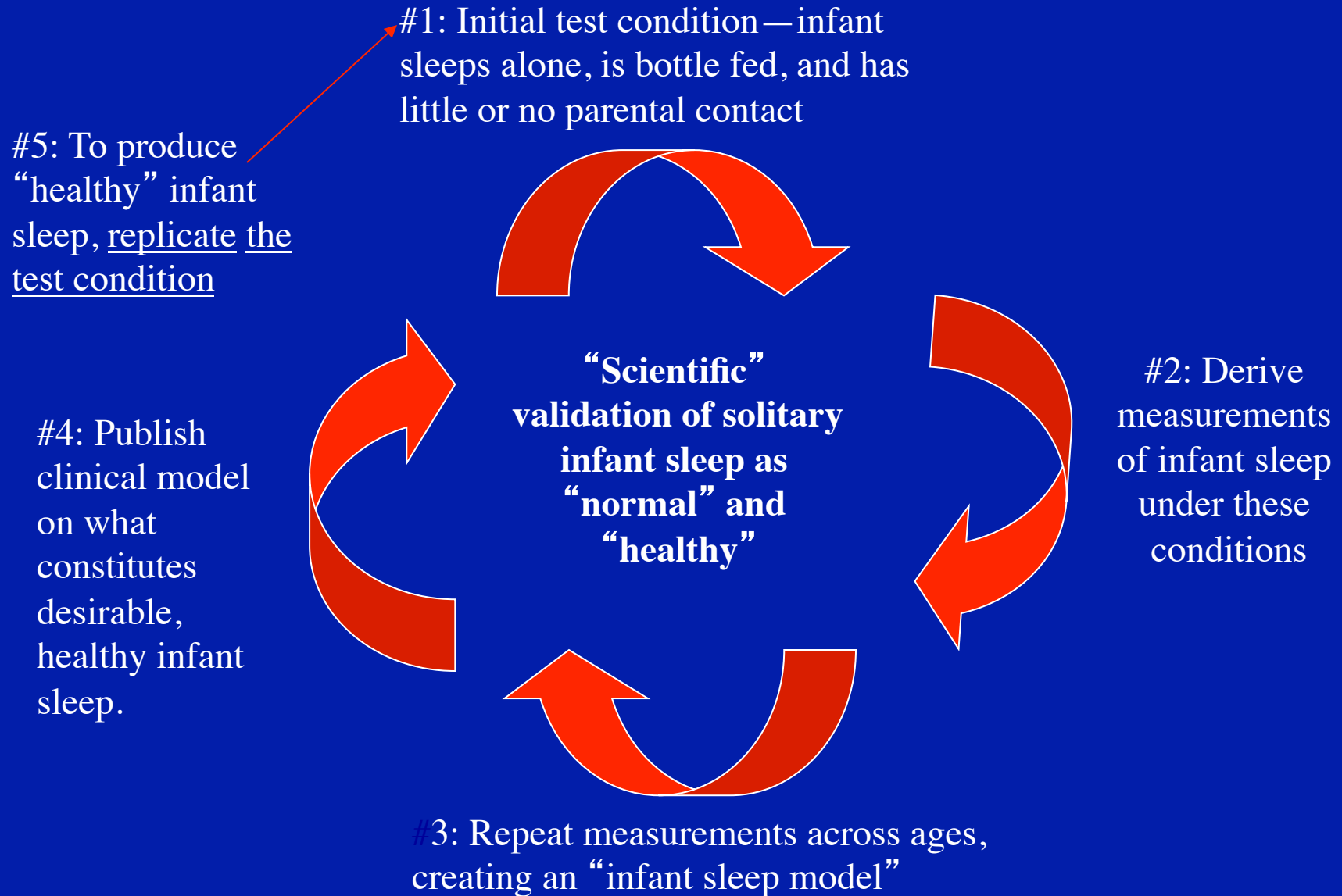
Creating the reality of mis-matches between what babies brain development “expects” biologically and what they actually receive in terms of their care....

Recommendations (conceptual models) are not necessarily based on empirical research rooted in evolutionary theories or processes but rather reflect recent cultural values and ideologies and technologies.. Often the science follows rather than leads..*permitting social ideology to masquerade as science*

Novel Environments

- Natural selection has not had time to revise our bodies for coping with fatty diets, automobiles, drugs, artificial lights, and central heating or even such diverse, and intense sensory inputs;
- A mismatch exists between our design and our environment--the biological and psychological “expected” vs. what occurs...
- We are stone age people living in a space age environment; does it matter?

Culture Producing Science Producing Culture: How A Folk Myth Achieved Scientific Validation



American Academy of Pediatrics

New Revised SIDS Guidelines

2005

infants should sleep proximate to mother i.e. should cosleep/roomshare

bedsharing should be avoided (is hazardous) infants should be taken out of bed to sleep;

avoid side position;

use pacifiers during sleep and once breastfeeding is established

What is the best public health strategy regarding bedsharing..

- Chianese J, Ploof D, Trovato C, Chang JCIInner-city caregivers' perspectives on bed sharing with their infantsAcad Pediatr. 2009 Jan-Feb;9(1):26-32 Department of Pediatrics, University of Pittsburgh School of Medicine, Pittsburgh, PA 15213, USA.
- **OBJECTIVE:** To understand parents' motivations for bed sharing with their infants aged 1-6 months, their beliefs about safety concerns, and their attitudes about bed-sharing advice. **METHODS:** Researchers conducted 4 focus groups with primary caregivers of infants ages 1-6 months who regularly shared beds with their infants. We recruited participants from an inner-city primary care center in Pittsburgh, serving primarily African American families who received medical assistance. Discussions were audiotaped and transcribed. Two investigators coded the transcripts and identified themes in an iterative process to achieve agreement between coders.

What Strategy?

- RESULTS: A total of 28 caregivers aged 17-50 participated. The majority were African American (86%), female (93%), single (50%), and high school graduates (71%). Eleven percent of participants breast-fed their infants. We identified 5 themes, common to all groups, to explain parents' motivations for bed sharing: 1) better caregiver and infant sleep, 2) convenience, 3) tradition, 4) child safety, and 5) parent and child emotional needs. Parents expressed divergent views about the safety of bed sharing: 1) ambivalence regarding balancing risks of overlaying and suffocation with benefits of bed sharing, or 2) assertion that bed sharing poses no risks for their child. *Common to all groups was the finding that clinicians' advice against bed sharing did not influence parents' decision, but advice to increase safety when bed sharing would be appreciated.*
- Chianese J, Ploof D, Trovato C, Chang JCIInner-city caregivers' perspectives on bed sharing with their infants. Acad Pediatr. 2009 Jan-Feb;9(1):26-32

Conclusion

- Parents' motivation to bed share outweighed the concerns and the warnings of others. An understanding of parents' perspectives on bed sharing should inform counseling to promote safe sleeping practices.

Dr. Peter Blair (Swiss Study)

- Fleming and Blair developed the SWISS (South West *England* Infant Sleep Study) to look more closely at the sleeping environment. They collected data from all SIDS infants aged 0-2 years in the South West over a four-year period from 2003-2006. There were 90 cases of SIDS, and 86 were analysed and allocated randomised controls, weighted for age and day or night sleep.
- However, if we demonise co-sleeping we have tired mothers who need to feed their babies sometimes several times during the night. *We cannot use simplistic labels saying bed sharing is safe or unsafe, advised Dr Blair. We should be in the business of explaining to parents the specific circumstances where co-sleeping should be avoided.*

The co-
sleeping
debate: two
faces, two
“truths” in
one..

do you see
them.. (a
young and
and old
woman, in
one face?)



*most significant central question in the SIDS
and bedsharing debate*

- is it legitimate to infer from high risk *populations* who bedshare,
 - where all SIDS risk factors are present, universal functional outcomes for bedsharing-- and to formulate public health recommendations against all bedsharing;
 - If not, what next?

*is the human mother's
sleeping body*

*an inherent lethal weapon against
which she and her infant need to
be protected...?*

Sometimes babies sleep alone in adult beds like this baby ...amidst physical chaos



Unsafe adult bed sleep environment (courtesy of Helen Ball)

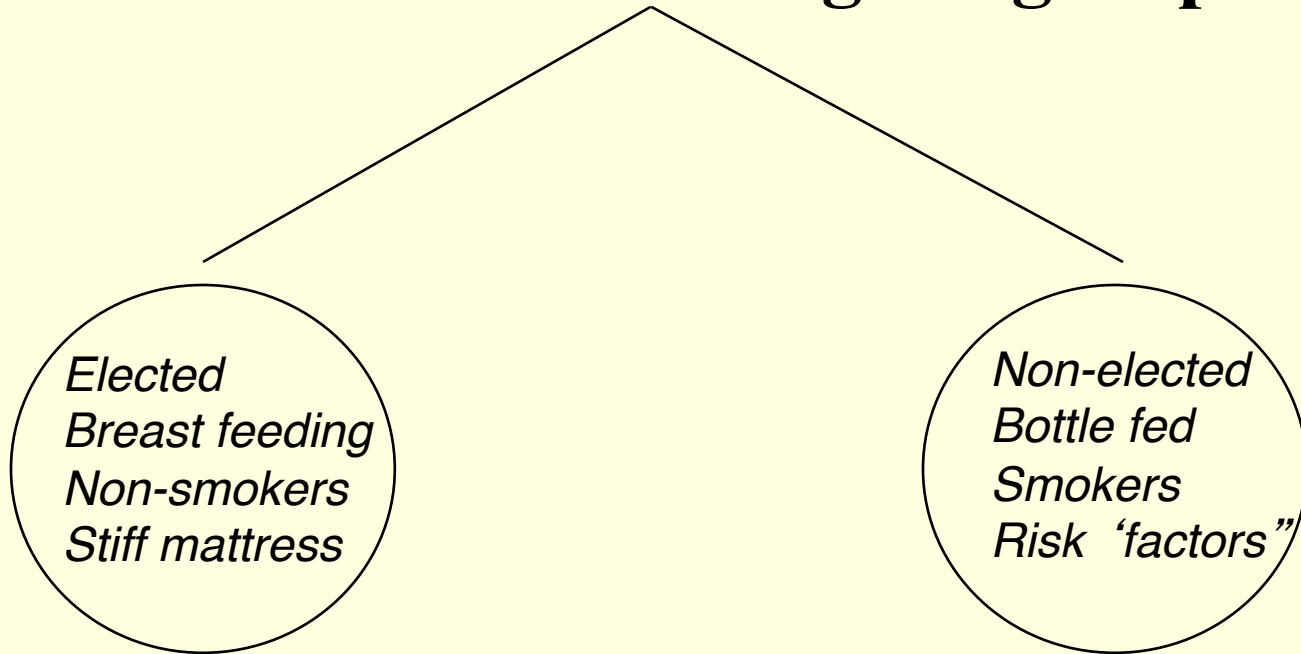
Or in beds too small for them...
a dangerous form of co-sleeping

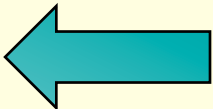


SIDS :

benefits-risks continuum

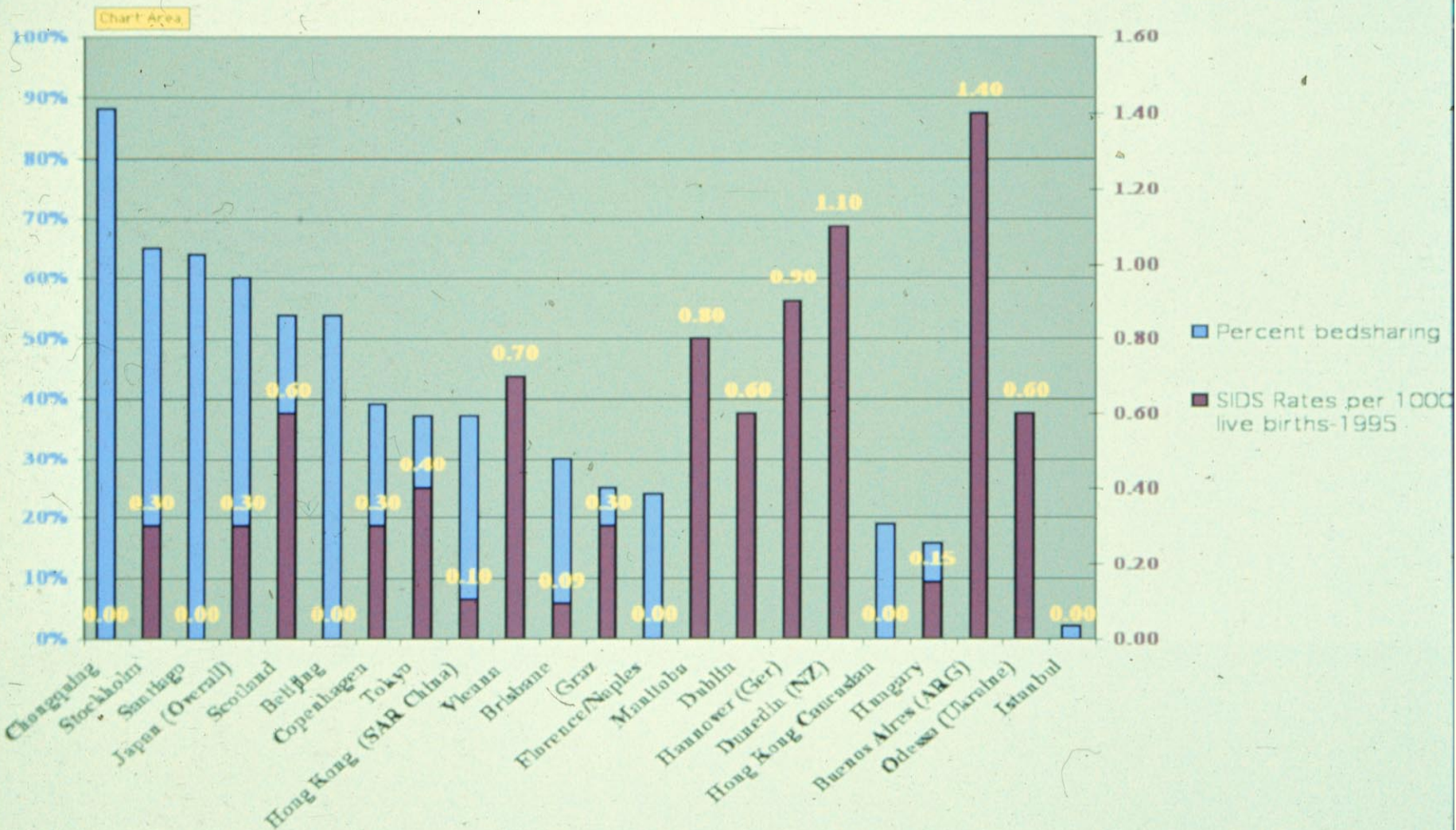
Two distinct bedsharing subgroups



 *Less Risk (protective?)*

More Risk 

SIDS Rates (1995) Per 1000 Live Births In Relationship to Percent Bedsharing



Initial Assumptions Determines How Infant Sleep Related Behaviors Depends on Initial Assumptions

- If to the researcher co-sleeping/ breastfeeding is normative, appropriate and expectable (biologically) then..
 - Babies accepting separation and isolation without protesting do so at their own peril;
 - Or--Infants who accept separation without protesting are developmentally immature and not adapted vigorously;
 - Infants who “sleep through the night’ at young ages are “at risk”;
 - Infants resting body temperature while sleeping alone is sub-normal;
 - Infant night wakings are protective, advantageous especially when associated with breastfeeding..
- If co-sleeping/breastfeeding is not normative, appropriate and expectable biologically then..
 - Night wakings are a problem to be eliminated, as are feedings..as soon as possible;
 - Protesting sleep isolation is a “problem to be solved” a disorder..a developmental deficiency;
 - Infants sleeping through the night represents adaptation, not a potential risk I.e. spending sleep time in deep sleep rather than light sleep;
 - Co-sleeping infants experience elevated body temperatures, putting them at risk for SIDS..I.e. hyperthermia;
 - Any and every problem associated with co-sleeping becomes an indictment against the practice, and proof the practice should be eliminated rather than being conceptualized as it is..a modifiable factor ..*a problem to be solved*
 - Baby;’ s nighttime breastfeeding hunger is something to be controlled, minimized, curtailed a soon as is possible

What does..

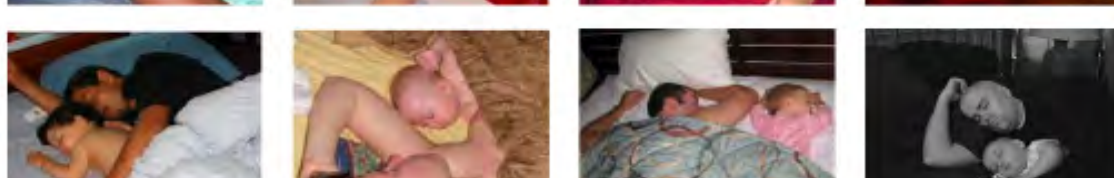
Co-sleeping look like?

Where and How Do Babies Co-sleep? ..a many splendid thing...



born to breastfeed...contact, co-sleeping, engagement

The human infant



Life, as we know it

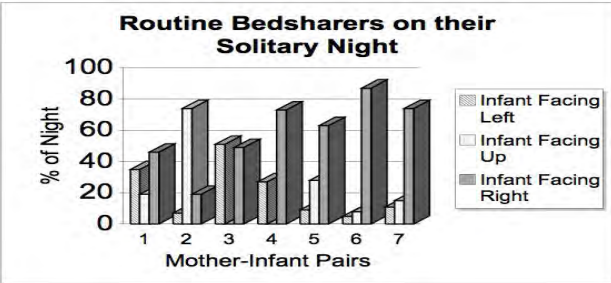
Characteristic Differences Between Breast and Formula Fed Infants Pertinent To Understanding Bedsharing Outcomes

In discourse about the safety of bedsharing (one form of co-sleeping) the effect of feeding method is either dismissed or overlooked.

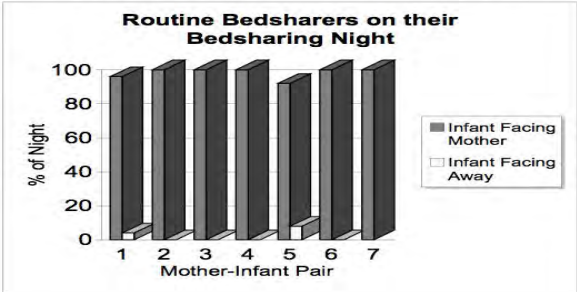
Table 4. Characteristic Differences Among Breast and Formula Fed Infants		
Orientation To Mother	Formula fed	Breastfed
Mother facing infant	59%	73%
Infant facing mother	46%	65%
Face to face	32%	47%
Infant Sleep Position		
Infant supine	83%	40%
Infant lateral	6%	54%
Infant prone	0%	0%
Height of infant in bed relative to mother		
Infant face level with mother's face or chin	71%	0%
Infant face level with mother's chest	29%	100%
Feeding frequency	1 bout	2.5 bouts
Total feeding time	9 minutes	31 minutes
Awakening frequency	2(0-4)	4(3-5)
Maternal arousals per night	2(0-4)	4(3-5)
Infant arousals per night	2(0-3)	3(2-5)
Mutual arousals	1(0-2)	3(1-4)
Source: Ball, 2006a.		

Where do babies “look” while co-sleeping and while sleeping alone; Hofer’s “hidden” regulatory mechanisms in the mother-infant relationship....

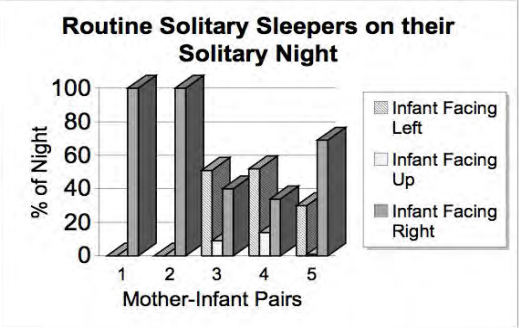
Infant facial orientation while sleeping alone



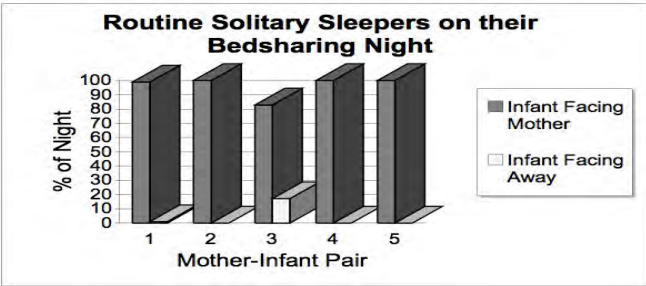
Infant facial orientation while sleeping with mother



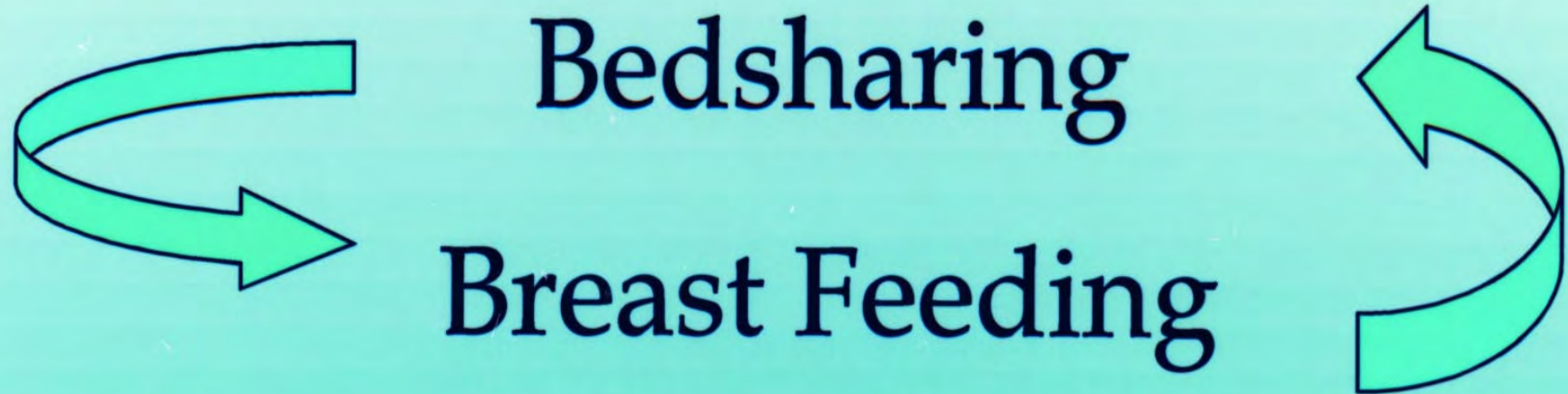
Infant facial orientation while sleeping alone



Infant facial orientation while sleeping with mother



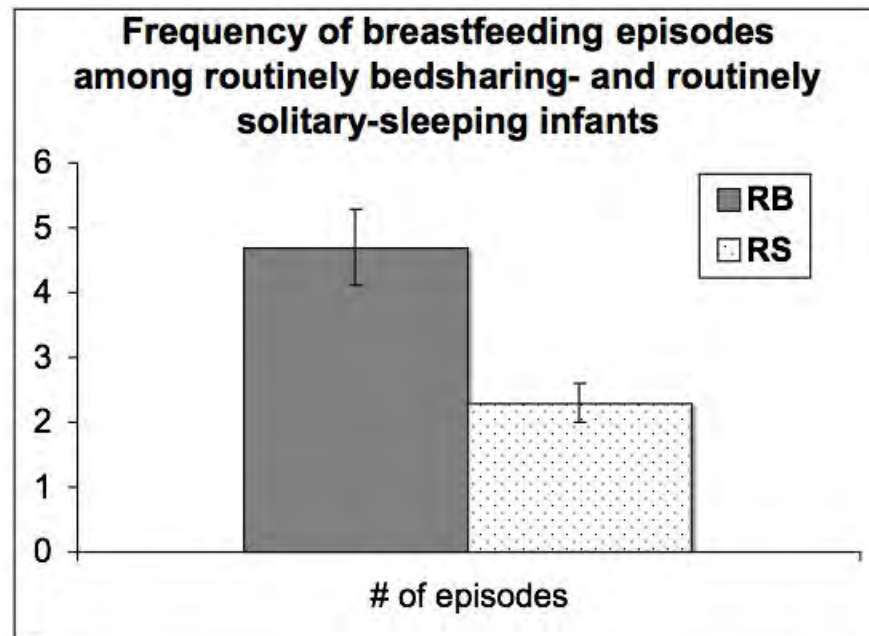
Infant-Parent Cosleeping with Breast Feeding: An Integrated Adaptive System



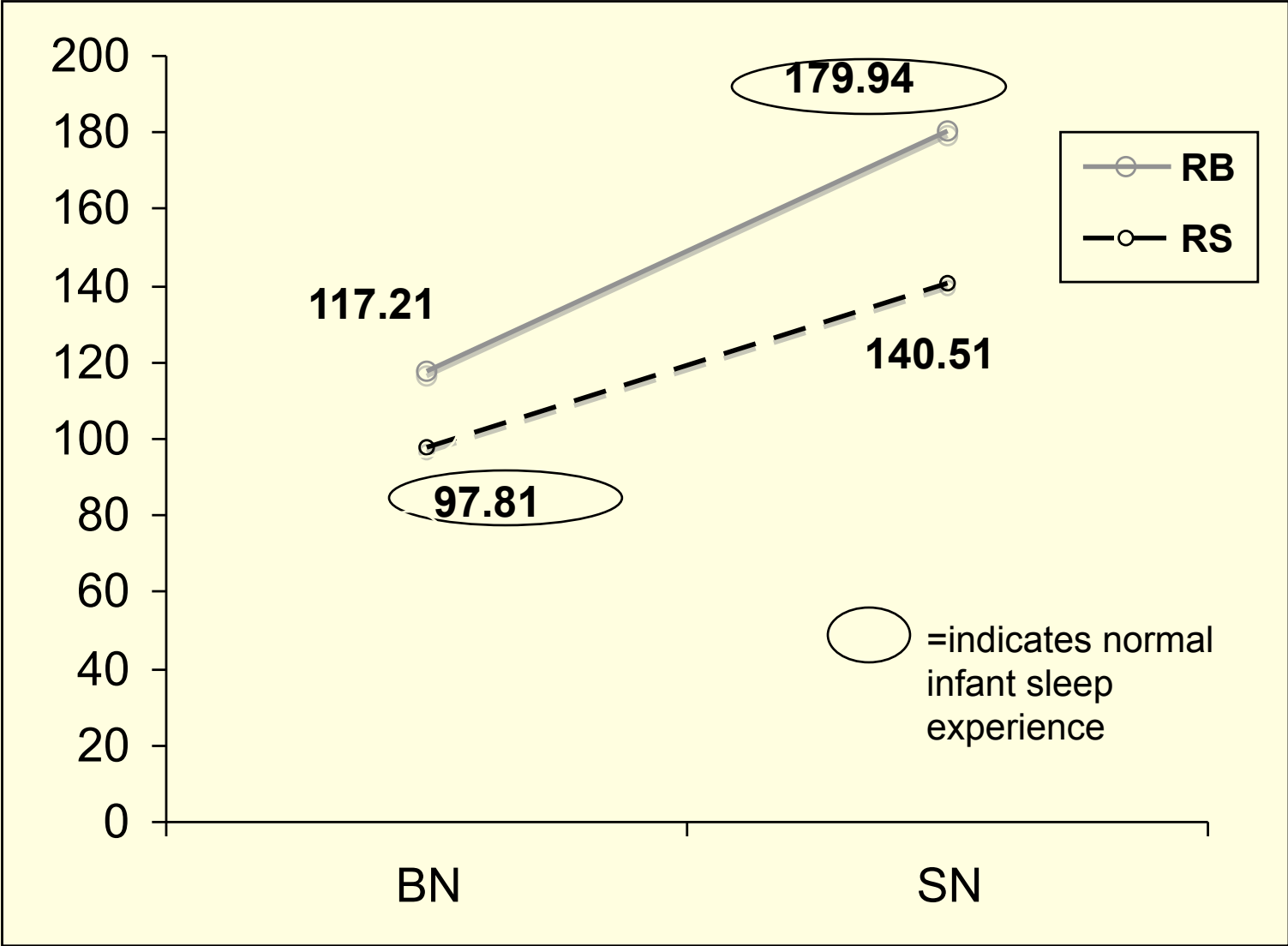
A mutual re-enforcing system

All studies confirm that bedsharing improves and enhances breast feeding (McKenna et al 1997, Ball 2003, Baddock 2006, Young 1999)

Breastfeeding Behavior in Mother-Infant Dyads



Mean Interval Between Feeds (in min) Per Group Per Night



Breast Feeding Matters In All Areas Of Infant Mortality Especially Effecting African Americans

- “Breastfed infants are 80% less likely to die before age 1 year than those who never breast fed, even controlling for low birthweight”;
 - For every 100 deaths in the formula-fed group, there were 20 deaths in the breast fed group
 - Using breast feeding as the normative behavior (20 deaths in the first year) the formula group with 100 deaths, had five times as many deaths or a 500% increase in mortality..
 - Forste et al 2001:108 291-296Pediatrics

Forste et al. 2001

“Analysis of infant mortality indicated that breast feeding accounts for race difference in infant mortality in the United States at least as well as low birth weight does”

Pediatrics 2001;108:291-296

“Breast Feeding and the Risk of Post-neonatal Death In the United States”

- Studied 1204 infants who died between 28 days and 1 year from causes other than congenital anomaly/tumor.and (7740 children who lived at 1 year) (controls);
- Calculated odds specific odd ratios for ever/never breast feeding amongst all children ...race-birth weight specific analysis--and duration-response effects;
- Longer breast feeding associated with lower risk: odds ratio range from:
 - .59 95% CI 0.38-0.94 for injuries to 0.84% (95%CI:.67-1.05) for **sudden infant death syndrome (SIDS); (Amin Chen and Walter J.Rogan)**
 - “Breast feeding has the potential to save or delay ~720 post=neonatal deaths in the United States each year
 - Pediatrics (2004) 113: E435-439...url:<http://www.pediatrics.org/cgi/content/full/113/e435>

The “dyad” IS the unit of study

Human infant (parental)
social care is synonymous
with
physiological regulation

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

the universality and diversity of co-sleeping

*Bobby Bowden... Florida State
University Football Coach*

**“I slept in the same bed with my
grandaddy..and then in the same
bed with my four cousins... I
never slept alone ‘til I got
married”. (South Bend, Indiana
9/29/2000)**

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”

How One Interprets Infant Sleep Related Behaviors Depends on Initial Assumptions

- If to the researcher co-sleeping/ breastfeeding is normative, appropriate and expectable (biologically) then..
 - Babies accepting separation and isolation without protesting do so at their own peril;
 - Or--Infants who accept separation without protesting are developmentally immature and not adapted vigorously;
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 - Co-sleeping infants experience hyperthermia;
 - Any and every problem associated with co-sleeping becomes an indictment against the practice, and proof the practice should be eliminated rather than a problem to be solved

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)

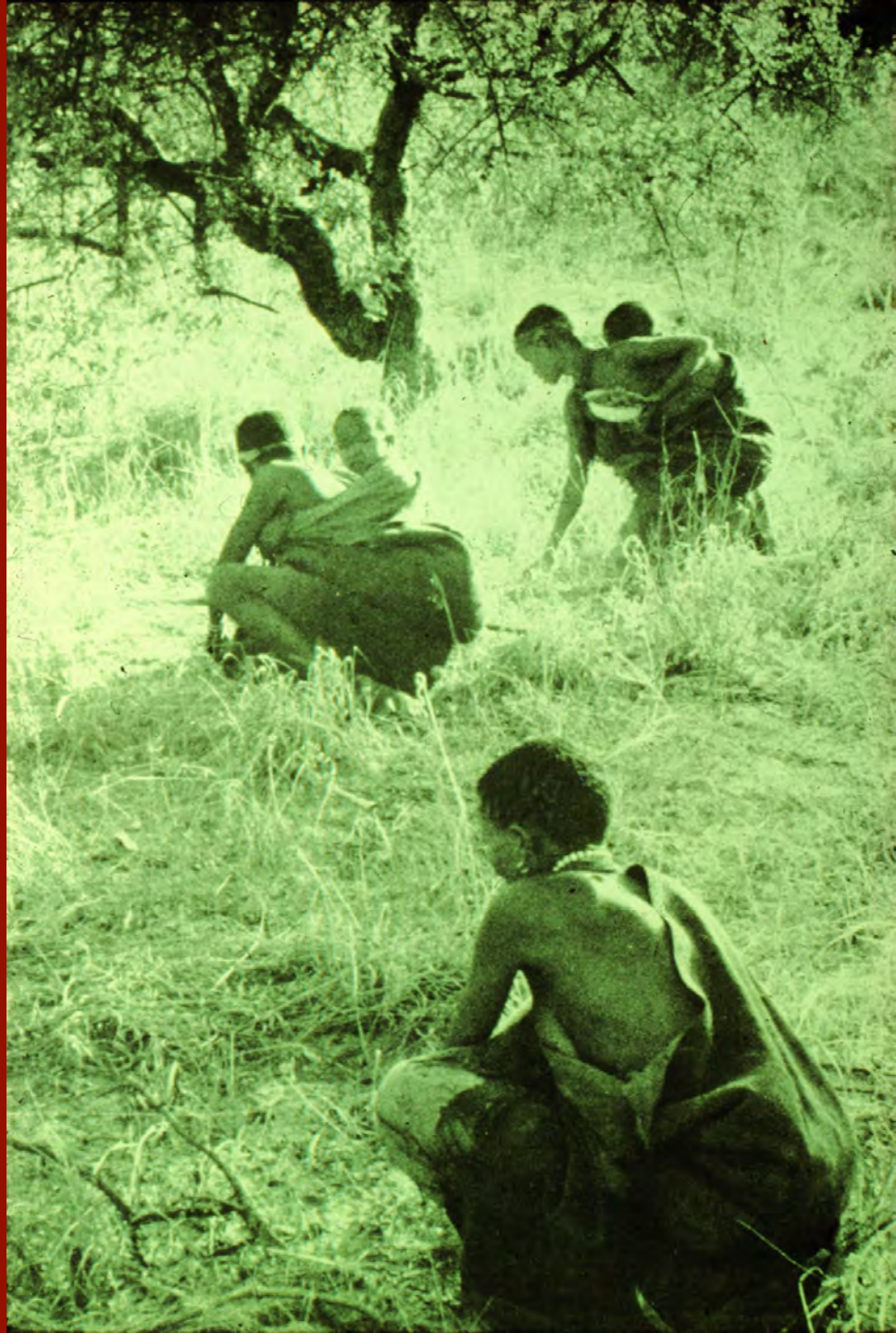
- immunological compromises (depressed antibody count);
- increased ACTH stress hormones
- cardiac arrhythmias
- breathing irregularities
- depressed body temperature
- sleep patterns disrupted
- behavioral abnormalities (excessive self-stimulation, hyperactivity, anaclitic depression)

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
- Sources: Barr 1993, Field et al. 1988, Christensson et al. 1993, Acolet et al 1989

David Barash: *The Tortoise and The Hare* (1987)

“ ...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.”



Oh, But let's not forget the Dads.



Diversity of Co-sleeping (requires taxonomic distinctions)



Co-bedding twins



partial, mixed



(within sensory range)



bedsharing with Dad

What Co-sleeping Looks Like

Koala



Maori, New Zealand

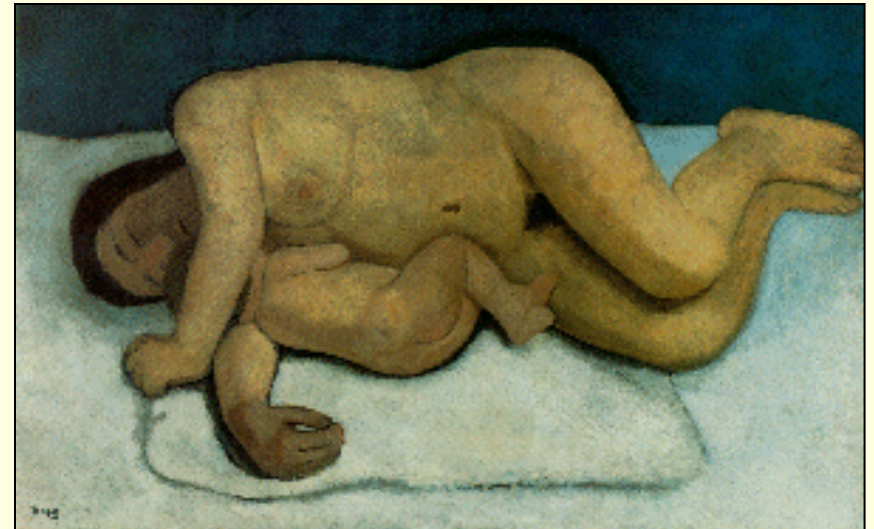
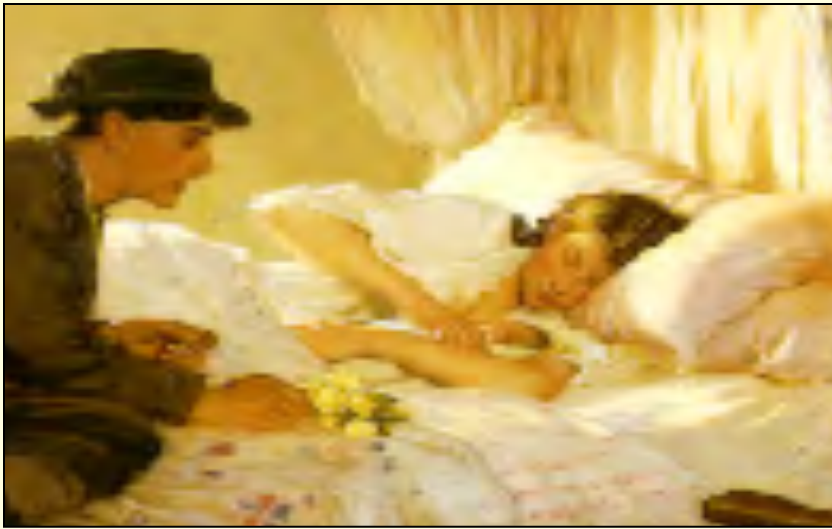


napping desert Aborigine



recliner co-sleeping (unsafe)

Home Studies (Dr.Helen Ball) Durham, England



Studying Mother and Infant Sleep And Feeding





**Mother-Baby
Behavioral Sleep
Laboratory**
At the University of Notre Dame



Sometimes babies sleep in mother-baby *sleep laboratories*



**Mother-Baby
Behavioral Sleep
Laboratory**
At the University of Notre Dame



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

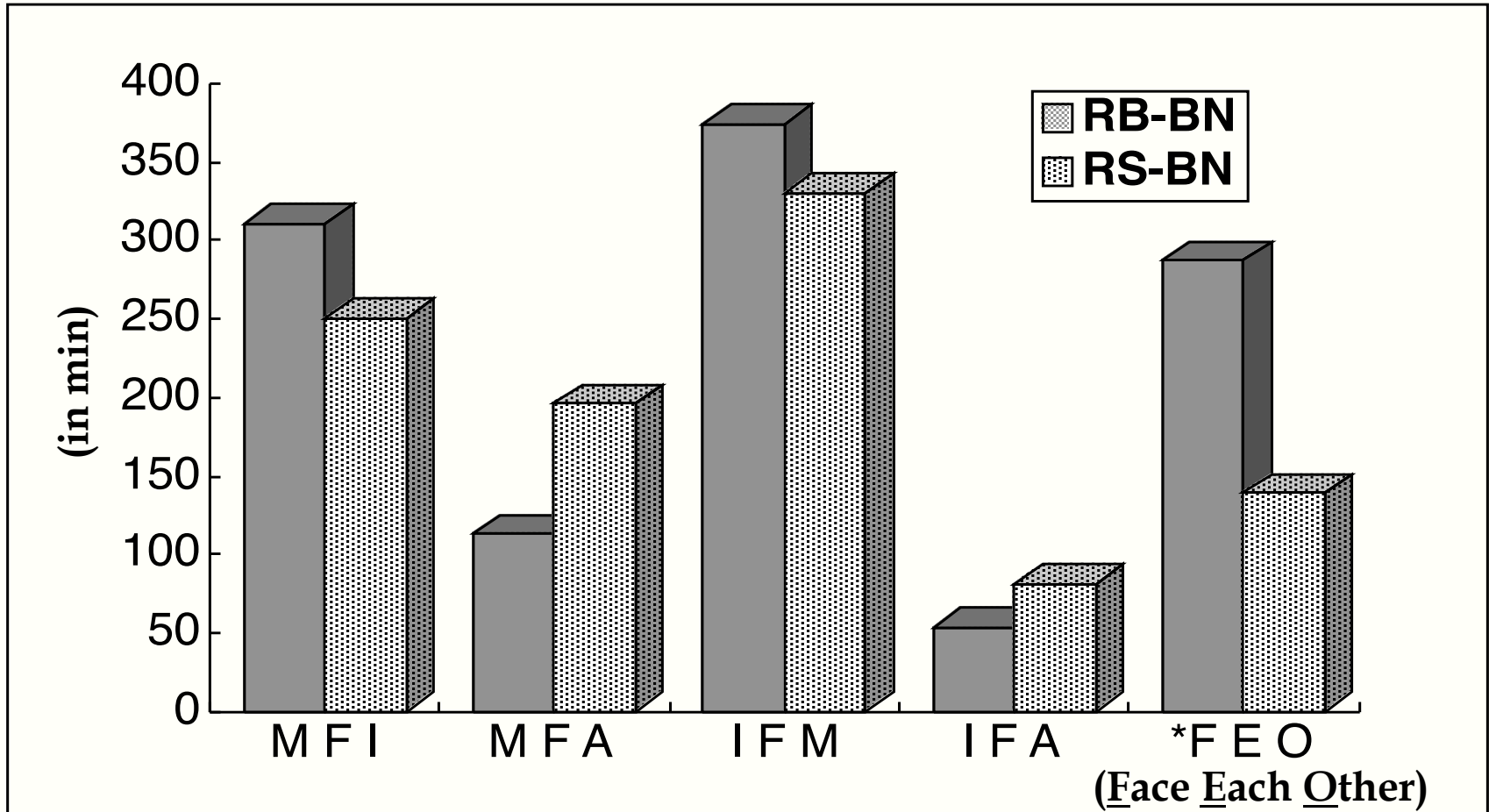
Nocturnal Lives Of Mothers and Infants

Examples:

- 1.Solitary-crib baby placed prone, face down;**
- 2. Neck-wrap, head covering, pillow, solitary, crib baby;**
- 3.Bottle-feed bedshare between pillow, teen mom ,lack of maternal response;**
- 4.Breast feeding mothers, high level of responsivity to infant;**



Mother and Infant Bedsharing Orientation on BN



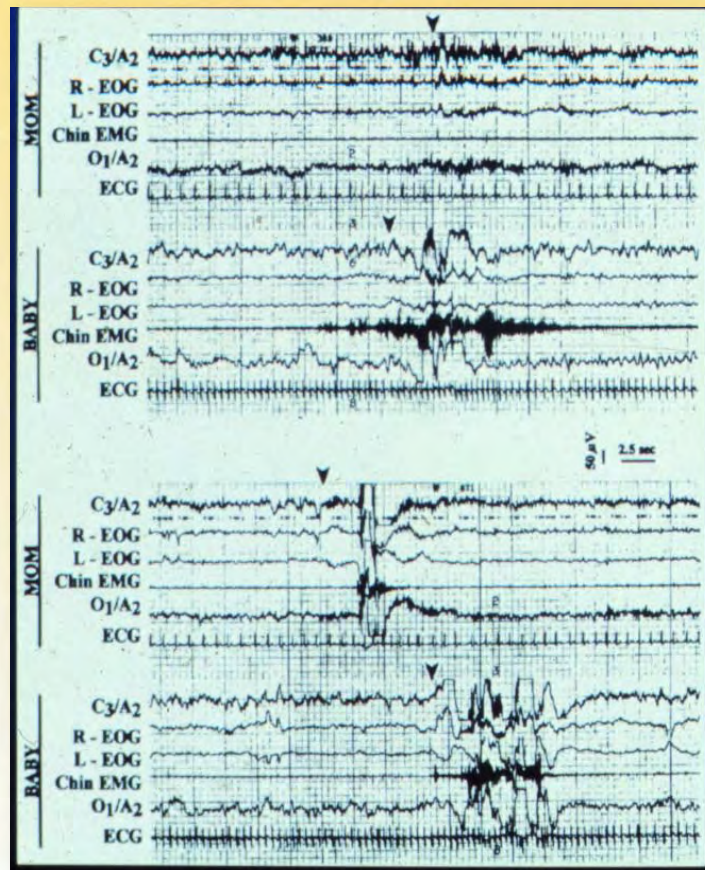
From: Richard et al., *Sleep* 19 (9) 1996

UC Irvine NICHD Bedsharing Study

James McKenna, Sarah Mosko, Chris Richard, Sean Drummond

- 37 Latina mother-baby pairs;
- Healthy infants (11-16 weeks) peak age for SIDS;
- exclusive breast feeders but two sub-groups: 21 routine bedsharers (RB), 16 routine solitary sleepers (RS)
- sleep and feeding logs kept by mothers for two weeks prior to study confirm sleep and feeding categories;
- Full polysomnography recording of both mother and infant simultaneously (EEG, EKG, EMG, EOG, Air Flow, Chest Movement-Respiratory Trace, Oxygen Saturation alongside *continuous infra red photography*;
- Three consecutive nights of recordings in laboratory alternating between bedsharing and separate room sleeping (two nights of routine behavior one randomly assigned experience in opposite condition)
- SN =solitary night
- BN=bedsharing night
- RB=routine bedsharer
- RS=routine solitary sleeper

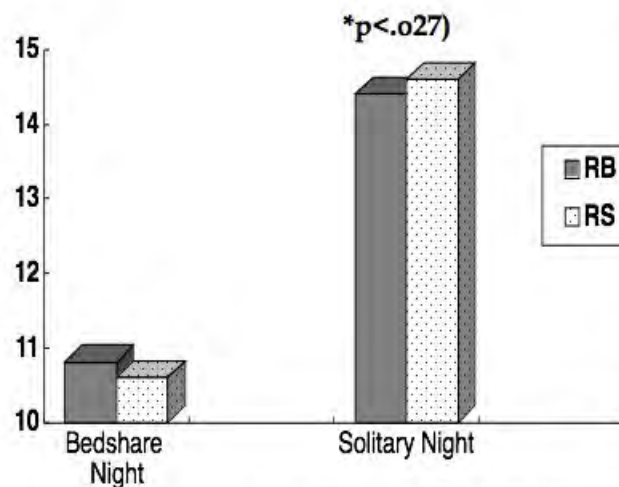
EEG Defined Mother and Infant Arousals



- Infant-induced maternal arousal.
- Maternal-induced infant arousal.

Co-sleeping *in the form of* Bedsharing: Increased protection for arousal deficient infants?

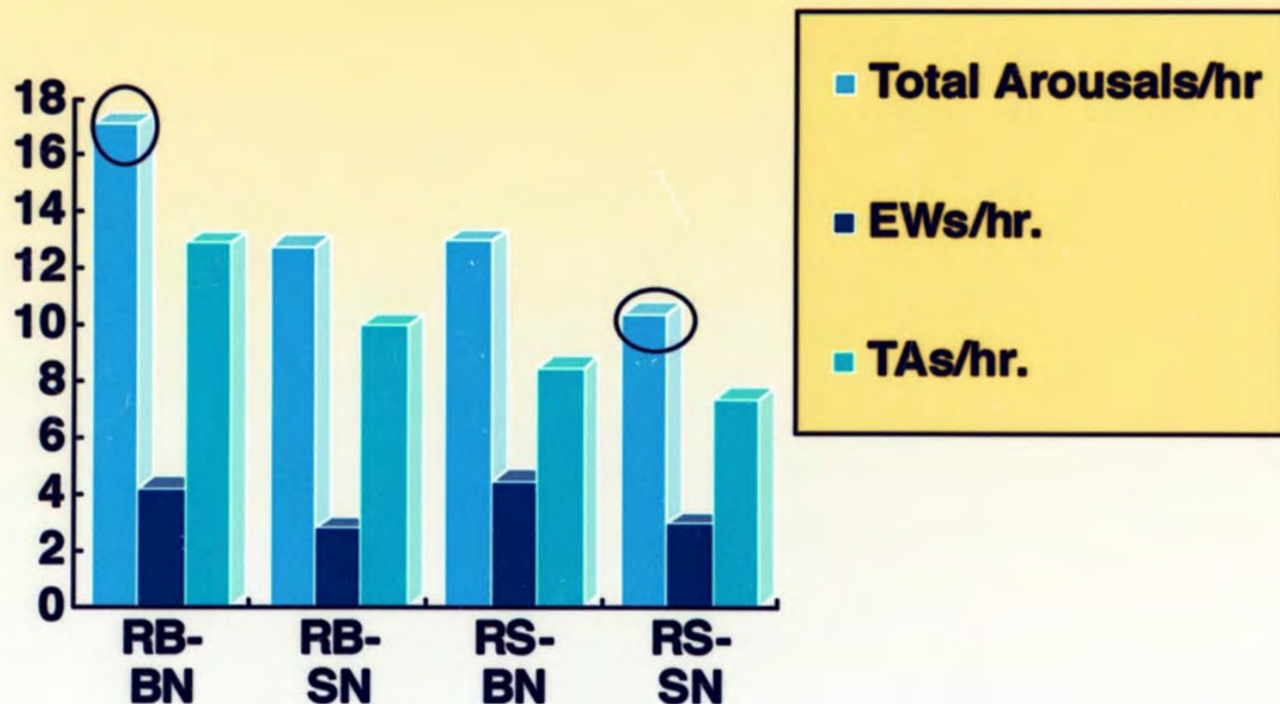
Mean Duration of Stage 3-4 Sleep: Why Important ?



- Schechtman et al. report that, at 3-4 months of age, siblings of SIDS victims display increased integrated delta amplitude, in early morning hours compared with controls;
- Siblings of SIDS and ALTE infants: deficient arousal responses to hypoxia or hypercapnia;
- SIDS victims: more difficulty awakening from sleep, fewer movements;

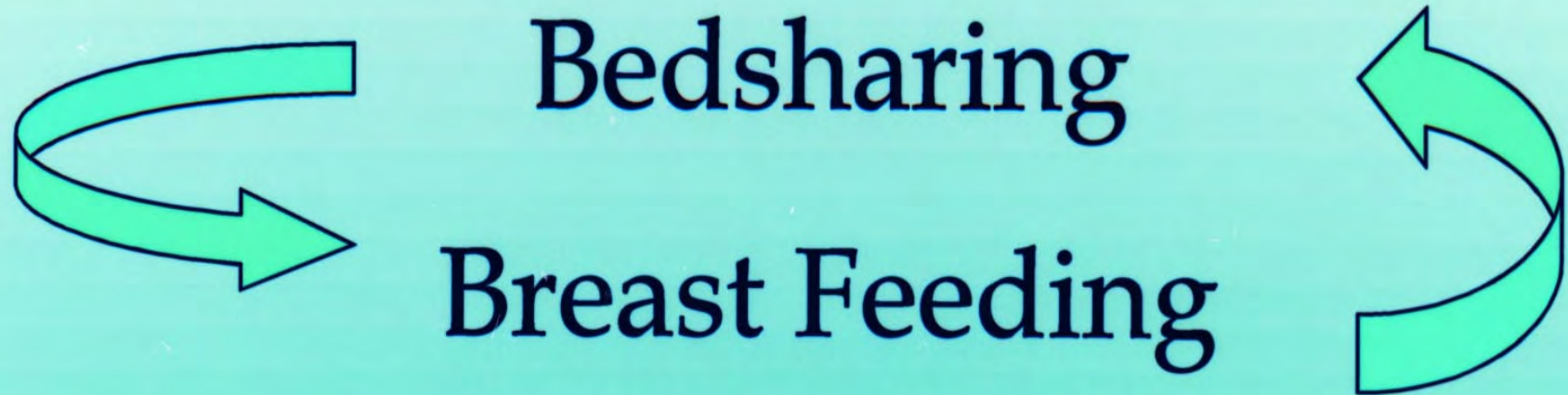
Mosko et al 1997 *Sleep*

Infant Arousals Per Group Per Night



all "bedsharing night" effects are significant for both groups ($p < .001$)

Infant-Parent Cosleeping with Breast Feeding: An Integrated Adaptive System



A mutual re-enforcing system

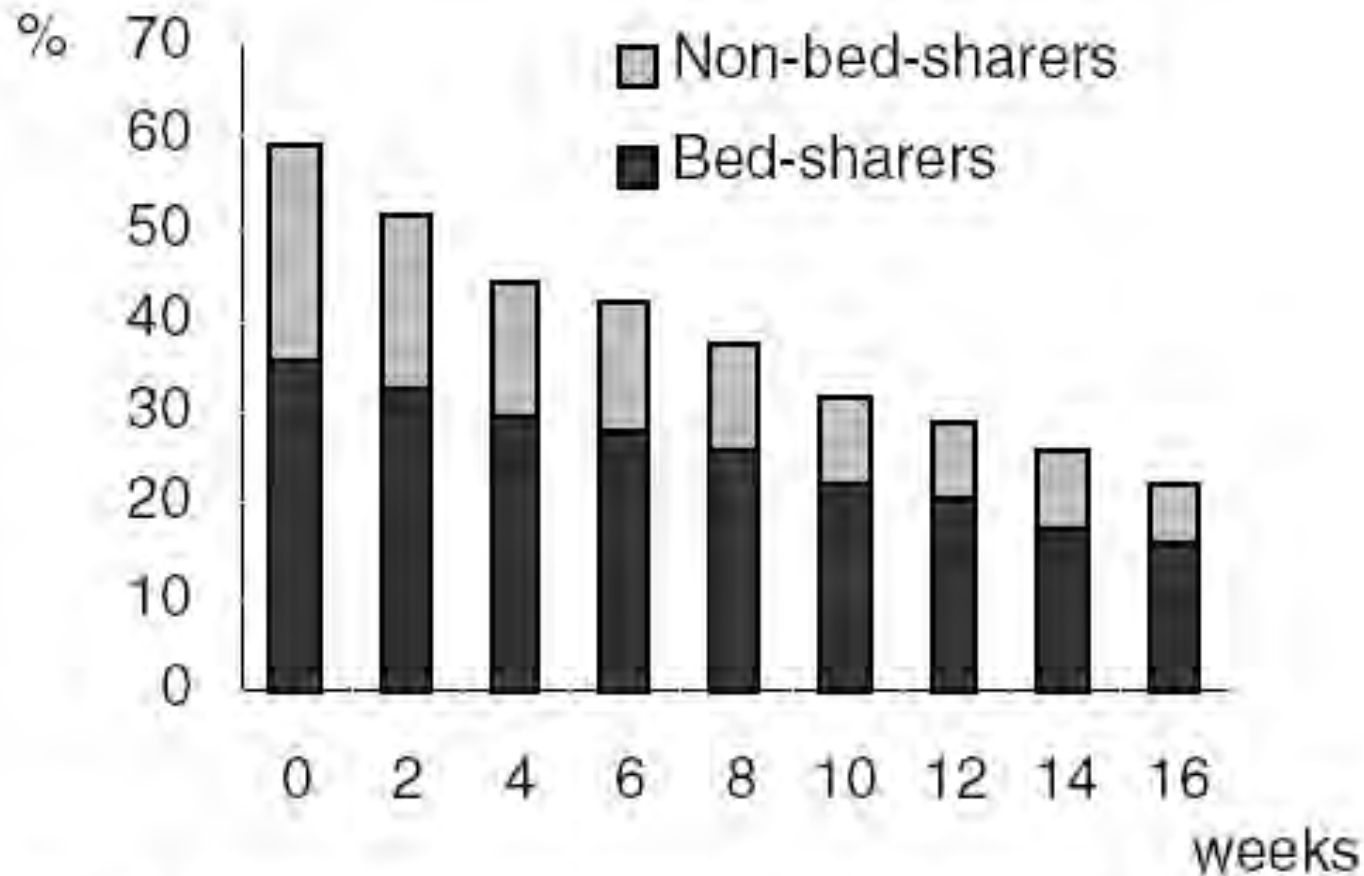
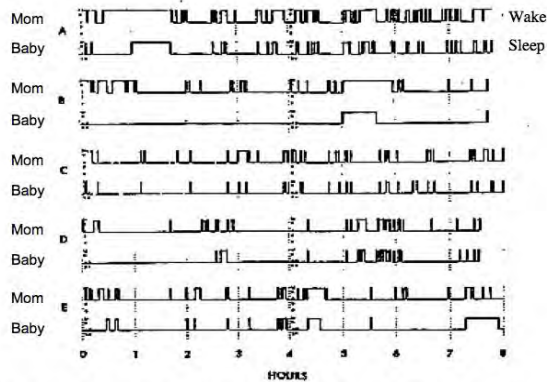


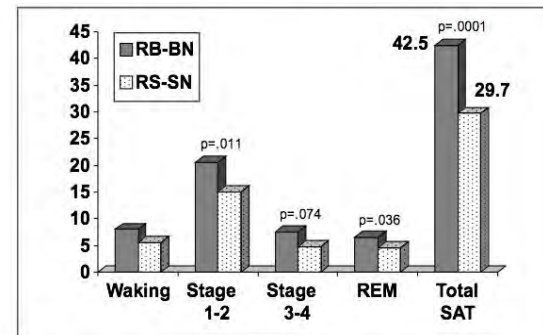
Fig. 2. Proportion of breastfeeding infants who did and did not bed-share from first month.

Mother-Infant Mutual Physiological Regulation

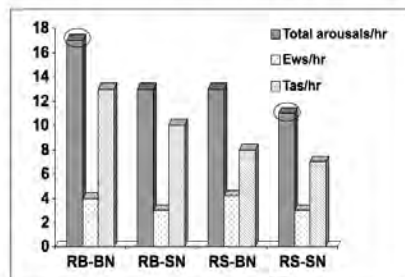


All-night sleep-wake histograms for five (A-E) cosleeping pairs. Mosko, McKenna et al (1993). Journal of Behavioral Medicine 16 (6).

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

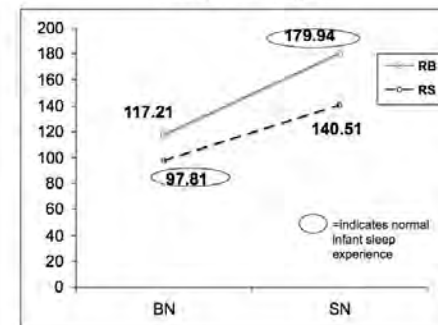


Infant Arousals Per Group Per Night

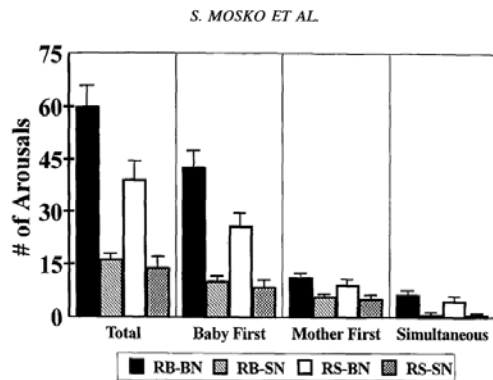


all "bedsharing night" effects are significant for both groups (p<.001)

Mean Interval Between Feeds (in min) Per Group Per Night



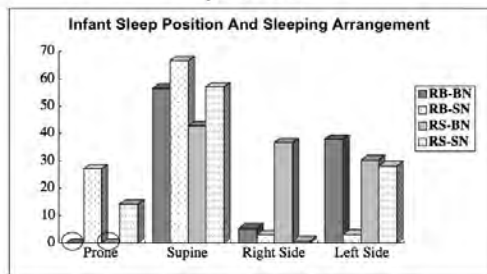
Sleep Architecture, Maternal and Infant Arousals Research



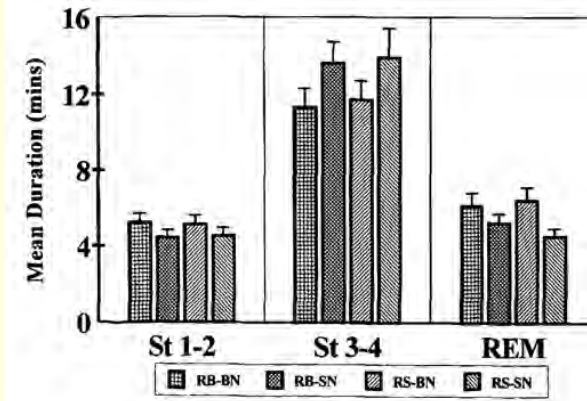
Maternal arousals

Pediatrics (1998)

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

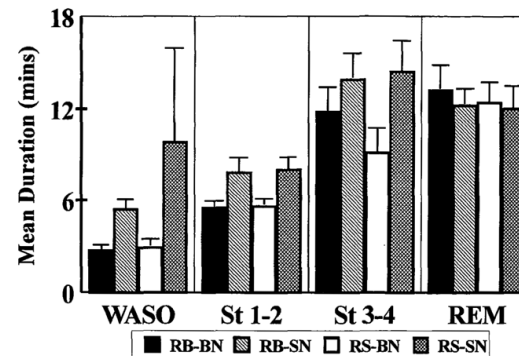


Richard et. al 1996, *Sleep*



Infant Sleep Architecture
Sleep (1997)

MATERNAL SLEEP DURING INFANT BEDSHARING



Maternal Sleep Architecture *Sleep* (1997)

Maternal Sleep Architecture on Bedsharing and Solitary Sleeping Nights: *Note Declines in Stage 3-4 Sleep and Increased Light Stage 1-2 On Bedsharing Nights*

TABLE 1. *Sleep architecture^a*

	Group	\bar{x} BN	\bar{x} SN	Group	Night	Interaction
Recording Time (minutes)	RB	475.9 ± 9.3	472.8 ± 9.4	0.144	0.136	0.435
	RS	455.4 ± 14.0	445.5 ± 15.1			
Total Sleep Time (minutes)	RB	392.3 ± 10.2	374.2 ± 11.0	0.250	0.188	0.219
	RS	360.2 ± 17.2	359.6 ± 22.4			
Sleep efficiency	RB	0.82 ± 0.01	0.79 ± 0.02	0.604	0.495	0.163
	RS	0.79 ± 0.02	0.80 ± 0.03			
WASO (minutes)	RB	58.6 ± 6.1	70.0 ± 6.6	0.784	0.553	0.461
	RS	62.7 ± 8.3	61.5 ± 11.9			
Stage 1-2 (minutes)	RB	220.2 ± 9.5	195.0 ± 8.5	0.753	0.004*	0.298
	RS	208.3 ± 16.1	196.0 ± 18.4			
Stage 3-4 (minutes)	RB	83.8 ± 5.6	93.2 ± 8.6	0.379	0.009*	0.508
	RS	72.1 ± 7.1	87.3 ± 8.5			
Stage REM (minutes)	RB	88.3 ± 5.0	86.0 ± 4.6	0.170	0.482	0.881
	RS	79.8 ± 4.9	76.3 ± 4.1			
Stage 1-2 (% TST)	RB	56.0 ± 1.8	52.1 ± 1.8	0.659	0.014*	0.833
	RS	57.1 ± 2.9	53.7 ± 2.9			
Stage 3-4 (% TST)	RB	21.4 ± 1.3	24.8 ± 2.2	0.991	0.001*	0.527
	RS	20.7 ± 2.4	25.5 ± 2.8			
Stage REM (% TST)	RB	22.5 ± 1.2	23.1 ± 1.1	0.340	0.680	0.344
	RS	22.2 ± 1.0	20.7 ± 1.6			
REM latency (minutes)	RB	66.8 ± 3.7	77.0 ± 7.0	0.036*	0.455	0.193
	RS	104.0 ± 14.1	87.9 ± 6.2			
No. REM episodes	RB	4.2 ± 0.2	4.1 ± 0.2	0.040*	0.349	0.753
	RS	3.6 ± 0.3	3.4 ± 0.3			

BN, bedsharing night; SN, solitary-sleeping night; WASO, waking after sleep onset; REM, rapid eye movement; RB, routinely bedsharing; RS, routinely solitary; SEM, standard error of the mean; ANOVA, analysis of variance.

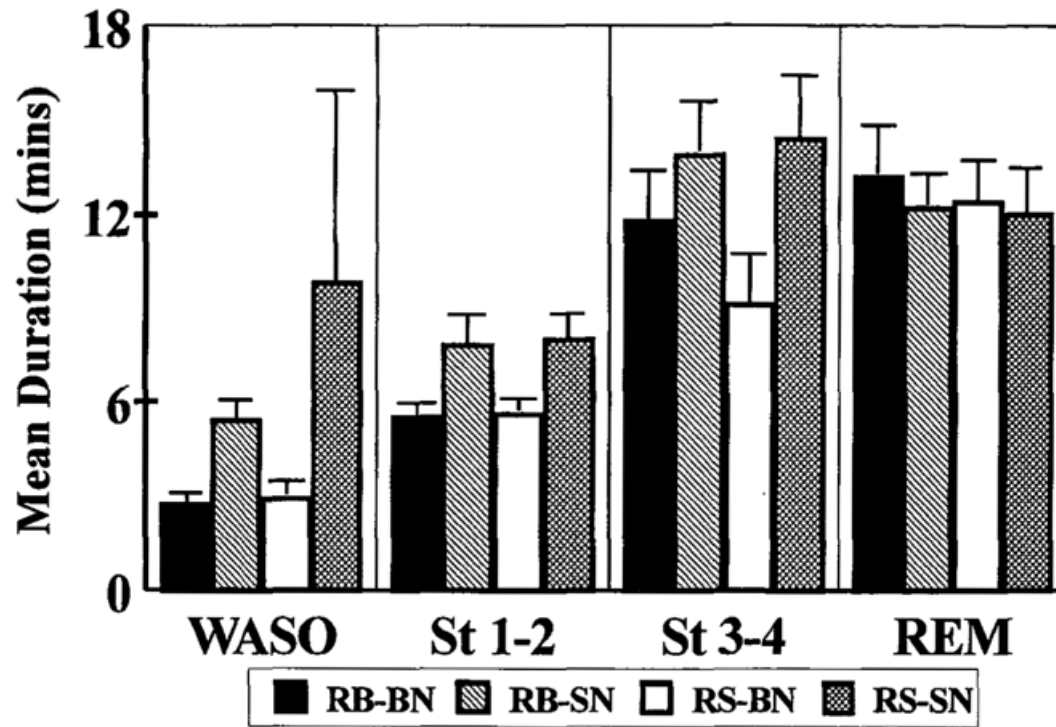
* Significant findings.

^a Table entries reflect group means (\pm SEM) and ANOVA results for 20 RB and 15 RS mothers. p values are given in the three columns on the right for group, night, and interaction effects.

From: Mosko, Richards and McKenna (1997) *Sleep*

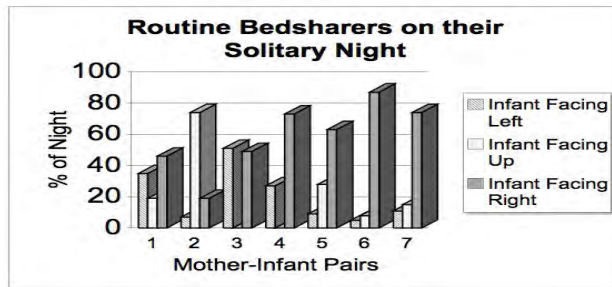
How Mothers Sleep While Alone and With Baby

MATERNAL SLEEP DURING INFANT BEDSHARING

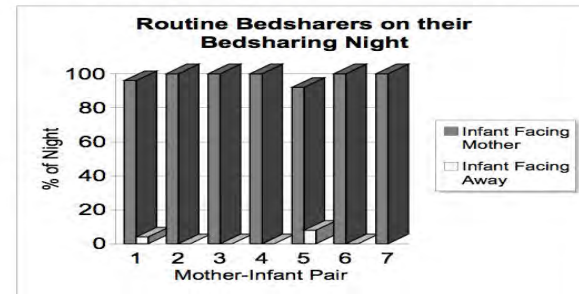


Where do babies look while co-sleeping and while sleeping alone

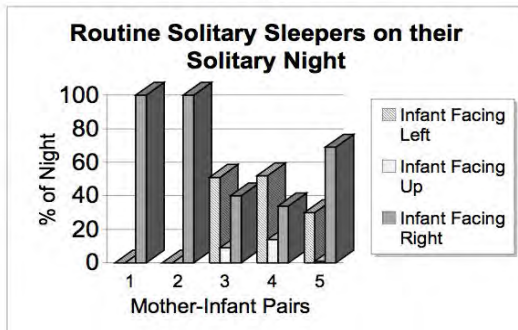
Infant facial orientation while sleeping alone



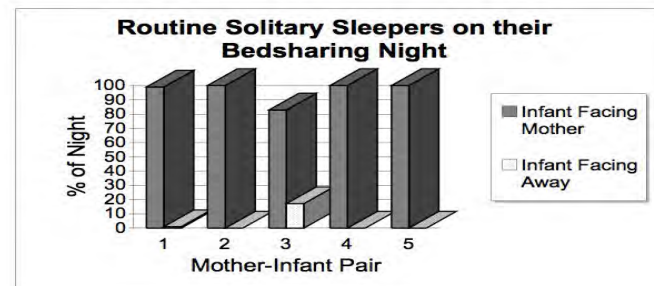
Infant facial orientation while sleeping with mother



Infant facial orientation while sleeping alone



Infant facial orientation while sleeping with mother



Measuring maternal contribution to infant exposure to CO₂

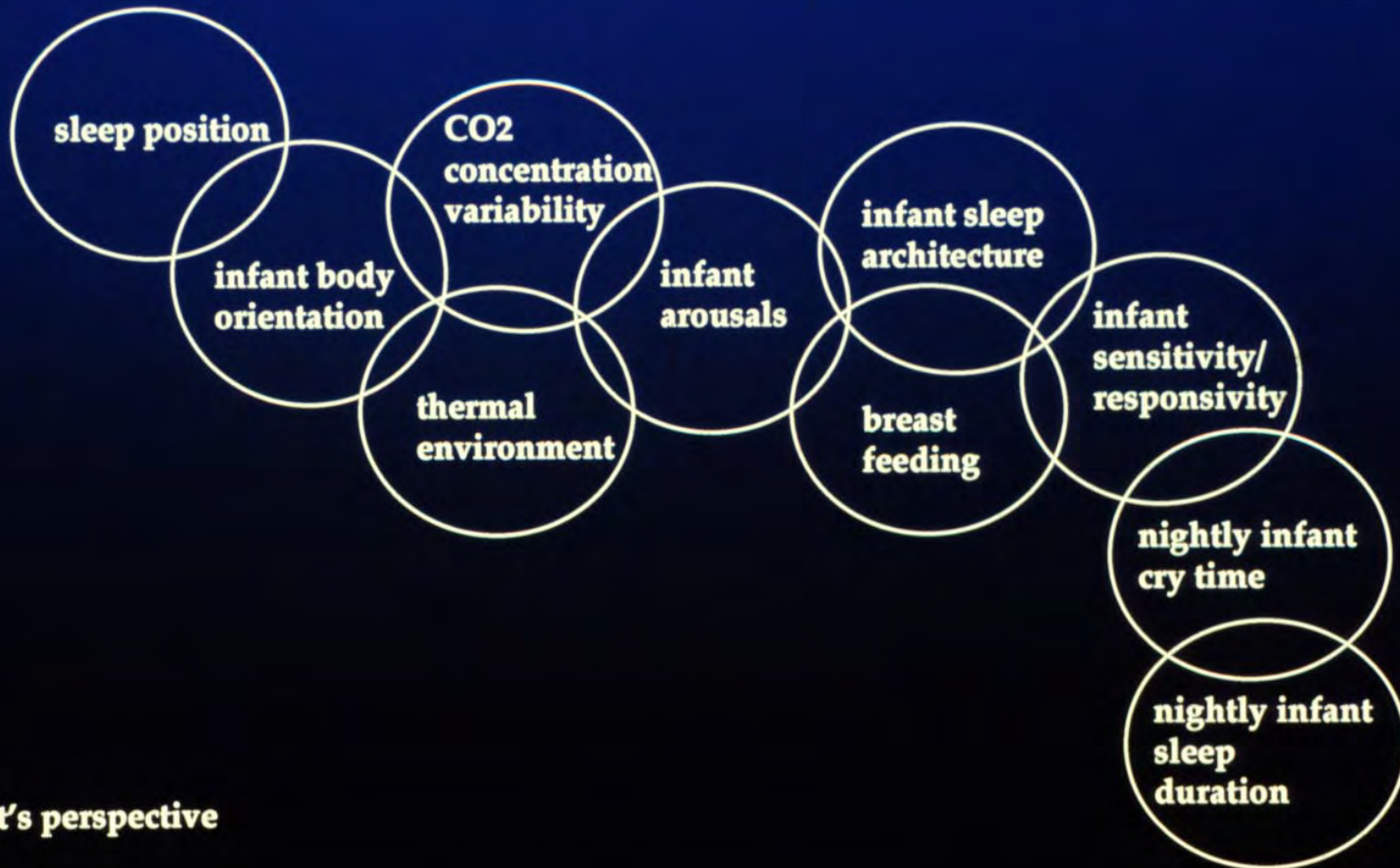


Maternal- Infant Micro-environment exchanging
heat, touch, sound, movement, CO₂, smells



**"Choice" of Sleeping Arrangement Sets In Motion
A "Cascade" of Potentially Beneficial
Biobehavioral Effects For the Mother-Infant Dyad**

Cosleep



From the infant's perspective

Cosleeping Sets In Motion A "Cascade" of Biobehavioral Effects and Events Relevant To Mothers



From the mother's perspective

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”

How Many Parents Co-sleep?

Depends on definition, parents perception and the way the question is asked...who is asking

In the United States and Great Britain most parents co-sleep and over half bedshare for part or all of the night..

The co-
sleeping
debate: two
faces, two
“truths” in
one..

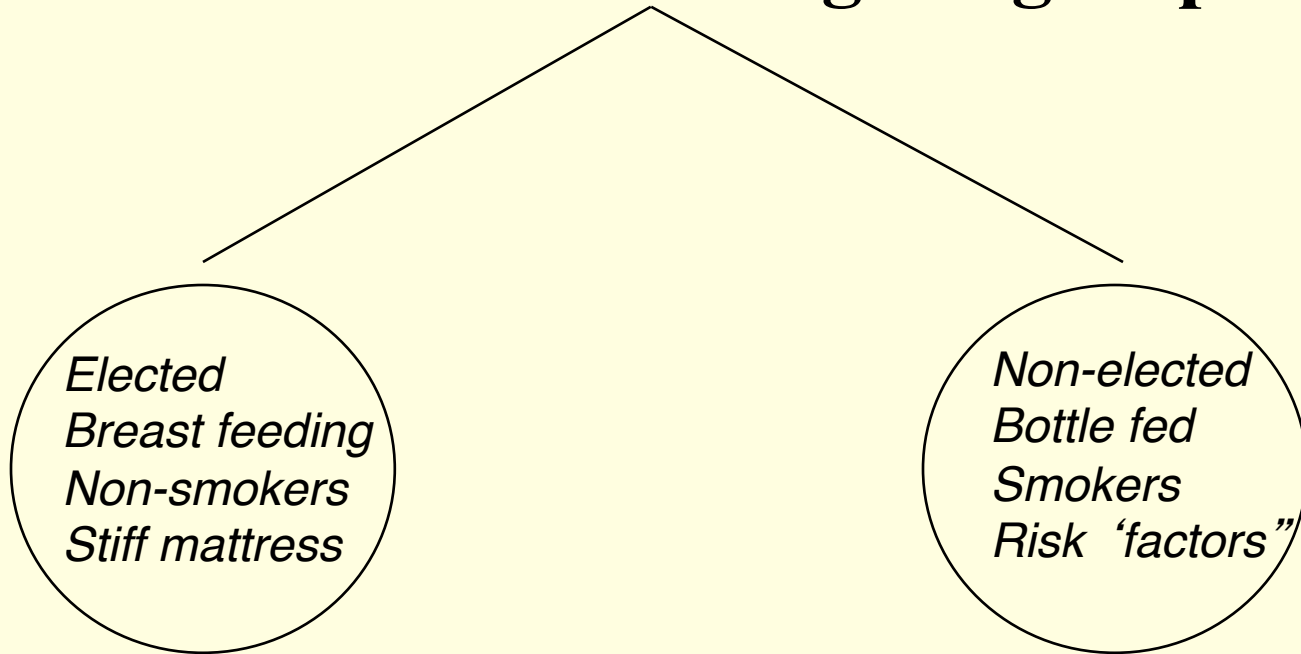
do you see
them.. (a
young and
and old
woman, in
one face?)



SIDS :

benefits-risks continuum

Two distinct bedsharing subgroups



Less Risk (protective?)

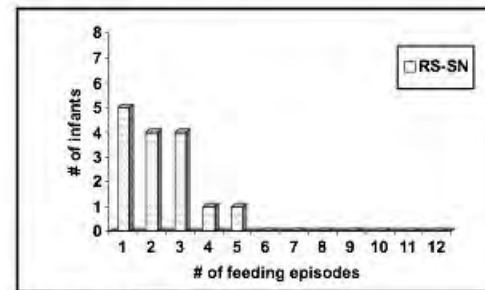
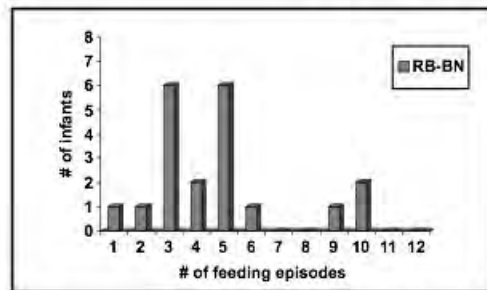
More Risk

How do culturally guided processes converge to create

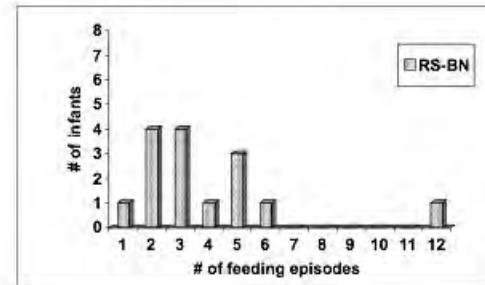
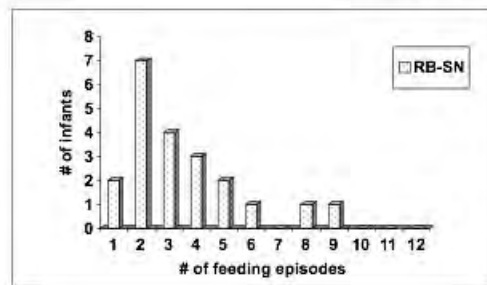
biological and developmental differences in infants...changing both short and long term outcomes ?.....*a dynamic example of mother-infant short term mutually regulating variables*

Breastfeeding sessions double and triple with maternal contact, *are reduced by at least half when sleeping solitarily*

Frequency Distributions of the Total Number of Breastfeeding Episodes Experienced by Infants Per Group Per Night



Routine feeding experience (above)



Breast Feeding Matters In All Areas Of Infant Mortality Especially Effecting African Americans

- “Breastfed infants are 80% less likely to die before age 1 year than those who never breast fed, even controlling for low birthweight”;
 - For every 100 deaths in the formula-fed group, there were 20 deaths in the breast fed group
 - Using breast feeding as the normative behavior (20 deaths in the first year) the formula group with 100 deaths, had five times as many deaths or a 500% increase in mortality..
 - Forste et al 2001:108 291-296Pediatrics

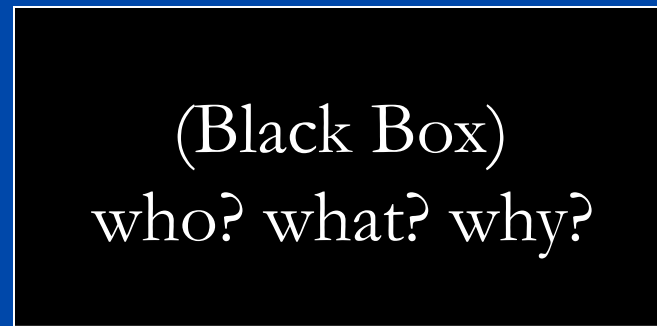
At the population level “outcomes” are not explained by “practice”

Outcomes Depend On...

What kind of relationship is brought to bed to share ?

Quality of attachment, maternal mental health, motivation, knowledge of adverse risk factors?
Furniture?

(Bedsharing Practices)



LEADS TO BENEFITS

LEADS TO DEATH

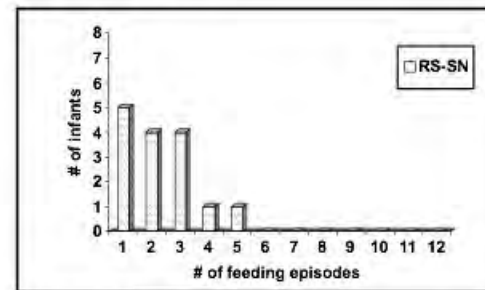
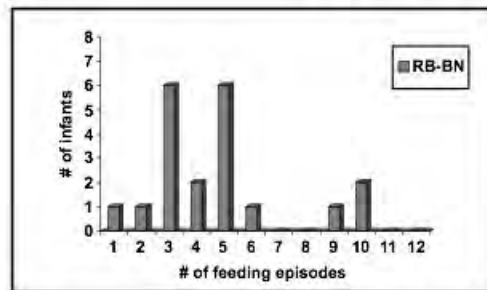
How linked to family characteristics ?

*most significant central question in the SIDS
and bedsharing debate*

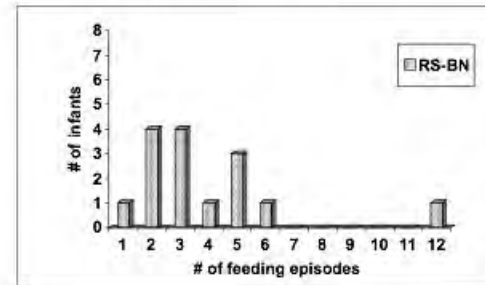
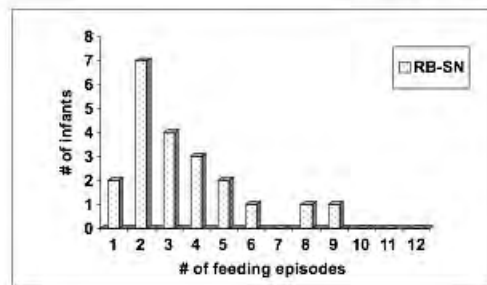
- is it legitimate to infer from high risk *populations* who bedshare,
 - where all SIDS risk factors are present, universal functional outcomes for bedsharing-- and to formulate public health recommendations against all bedsharing;
 - If not, what next?

Breastfeeding sessions double and triple with maternal contact, *are reduced by at least half when sleeping solitarily*

Frequency Distributions of the Total Number of Breastfeeding Episodes Experienced by Infants Per Group Per Night



Routine feeding experience (above)



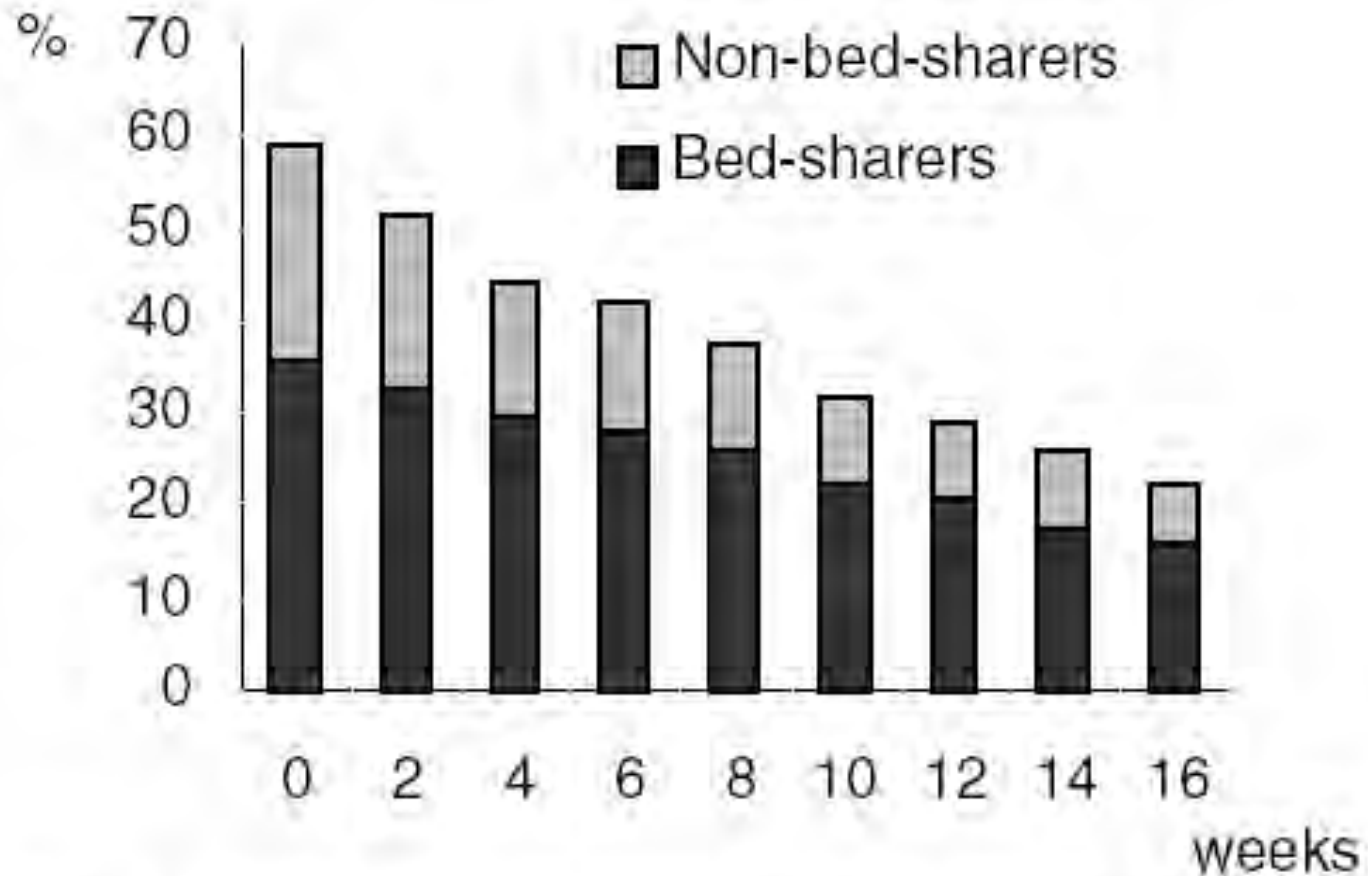


Fig. 2. Proportion of breastfeeding infants who did and did not bed-share from first month.

What Makes Infant Sleep Safer

- Supine sleep position and presence of committed adult caregiver;
- Exclusive breastfeeding to nonsmoking mother;
- Parental knowledge of safe crib and co-sleeping environments;
- Stiff mattresses, use of sleep suits, absence of soft-clothy materials surrounding infant face;
- Absence of gaps, holes, spaces surrounding sleep structure into which infants can fall to be wedged;
- Absence of drugs, alcohol desensitizing medicines;
- Absence of all but mother and/or father in co-sleeping environment..no children co-sleeping with infant;
- If routinely bedsharing, pull frame off of bed, center in middle of room on floor;
- If bottle feeding, or a smoker, avoid bedsharing, place crib or bassinet next to bed, separate surface;
- Adhere to routine practice;
- Avoid co-sleeping on couches, armchairs, recliners, or waterbeds;
- Avoid indifferent attitude; if bedsharing, agree that each adult has responsibility for monitoring presence of baby;
- If bedsharing, do so enthusiastically with both partners agreeing;

Where the controversies lie?

(General Questions)

- Bedsharing safety..how safe is safe? Informed parents ? or medical authorities decide?
- Evidence (whose) ? What kind of evidence is privileged or prioritized? Only Epidemiology? Laboratory? Home Studies? Ethological? Evolutionary? Cross-cultural?
- Who decides which lines of evidence are *unimportant* to recommendations?
- Who should decide whose scientific understandings and/or findings and facts should be dismissed?
- Who decides which risks are worth taking and what risks are worth investing in to eliminate?

(Questions Specific to Sleep Research)

- Interpretations of findings: what is healthier and for whom as regards: awakenings? Nighttime feedings vs. consolidated sleep? Light maternal-infant sleep vs. deep sleep? Infant's protesting separation? Infants accepting separation? Higher or lower infant body temperatures?
- Long term vs short term findings or is independence and problem solving skills i.e advantages in other domains achieved by routine at birth co-sleepers as valuable or more valuable than willingness to sleep alone, achieved much earlier by routine solitary sleepers?
- Because some cannot bedshare safely does it mean that nobody can..or should be permitted to try?