

OPTIMAL COGNITION, EMOTION AND SOCIAL: A RIGHT OR A CHOICE?

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THE MEN BEHIND IQ

Binet and Simon



Treman

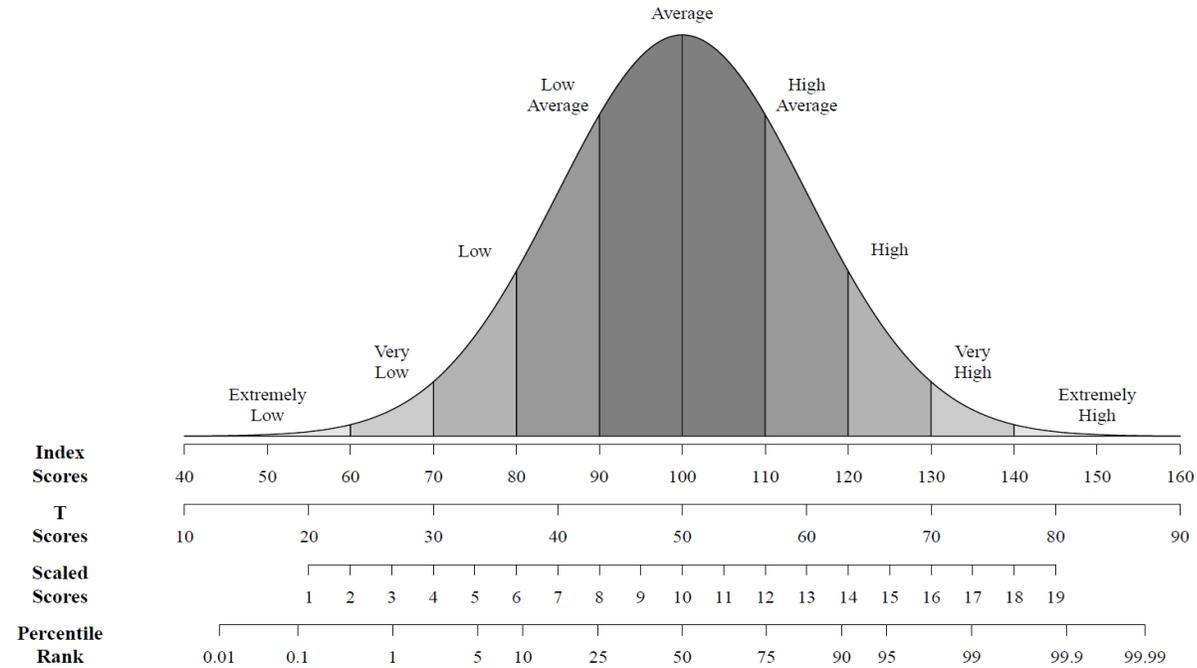


Weschler



INTELLIGENCE QUOTIENT

Standard Scores



EMOTIONAL INTELLIGENCE

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Top Performers In Tertiary Institutions

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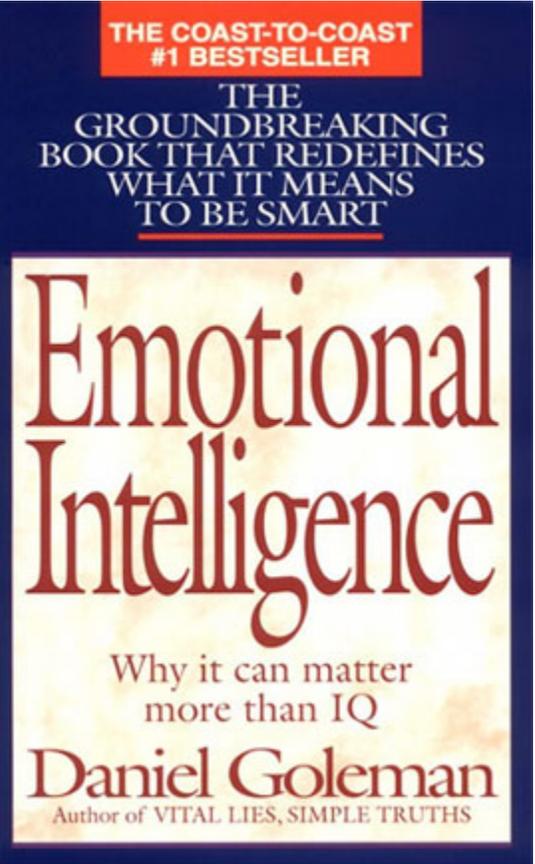


Job Performance

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Make More Money



EMOTIONAL INTELLIGENCE

The ability to monitor own and others feelings and **emotions**, to discriminate among them and to use this information to guide one's thinking and actions

Peter Salavoy and John Mayer

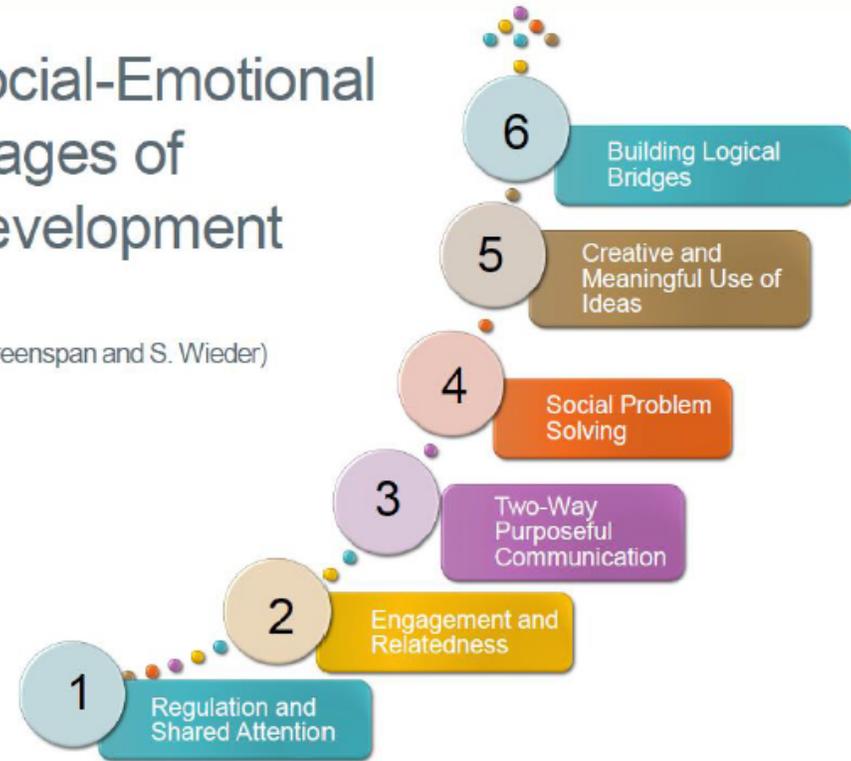
The EQ-i^{2.0} Model



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Social-Emotional Stages of Development

(S. Greenspan and S. Wieder)



A gradient of childhood self-control predicts health, wealth, and public safety

Terrie E. Moffitt^{a,b}, Louise Arseneault^b, Daniel Belsky^a, Nigel Dickson^c, Robert J. Hancox^c, HonaLee Harrington^a, Renate Houts^a, Richie Poulton^c, Brent W. Roberts^d, Stephen Ross^a, Malcolm R. Sears^{e,f}, W. Murray Thomson^g, and Avshalom Caspi^{a,b,1}

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Children with poor self-control...

higher rates of risk taking behaviour (smoking, unplanned teenage pregnancies)

reported more money-management difficulties and had accumulated more credit problems

were more likely to be convicted of a criminal offence

Siblings comparison

Sibling with lower self-control had poorer outcomes, despite shared family background

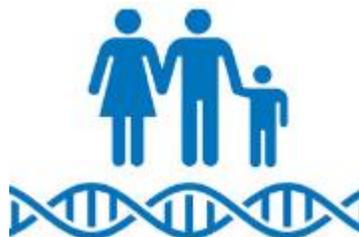
What you do, eat or experience during the first 1000 days has lifelong consequences for your health

Mc Mullen 2009



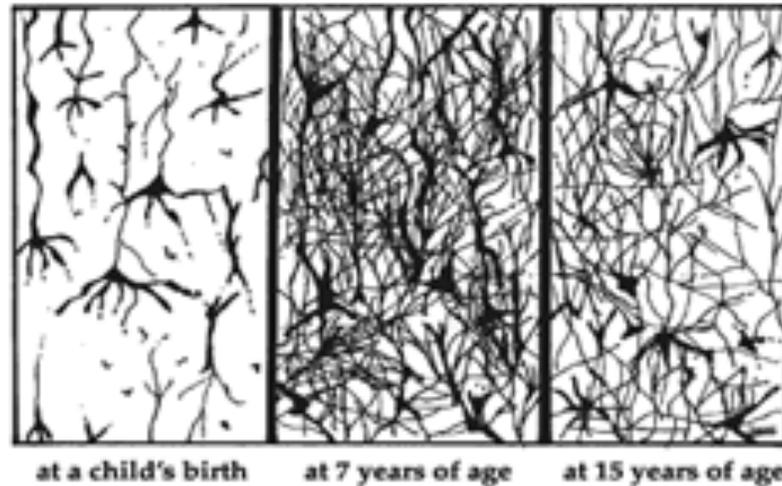
BRAIN DEVELOPMENT

- In the first year of life, the brain triples in size
- 60% of the energy consumed is used by the brain – fuelled by fat
- By 3 years old, the brain is more than 80% the size of an adult brain and by 5 years old it reaches 90%
- Myelination starts in utero and continues postnatally at a rapid speed but is interrupted by poor nutrition
- More complex cognitive functions develop postnatally driven mostly by what an infant experiences throughout his life



Shonkoff J Dev Behav Pediatr 2003

Developmental Plasticity: Synaptic Pruning

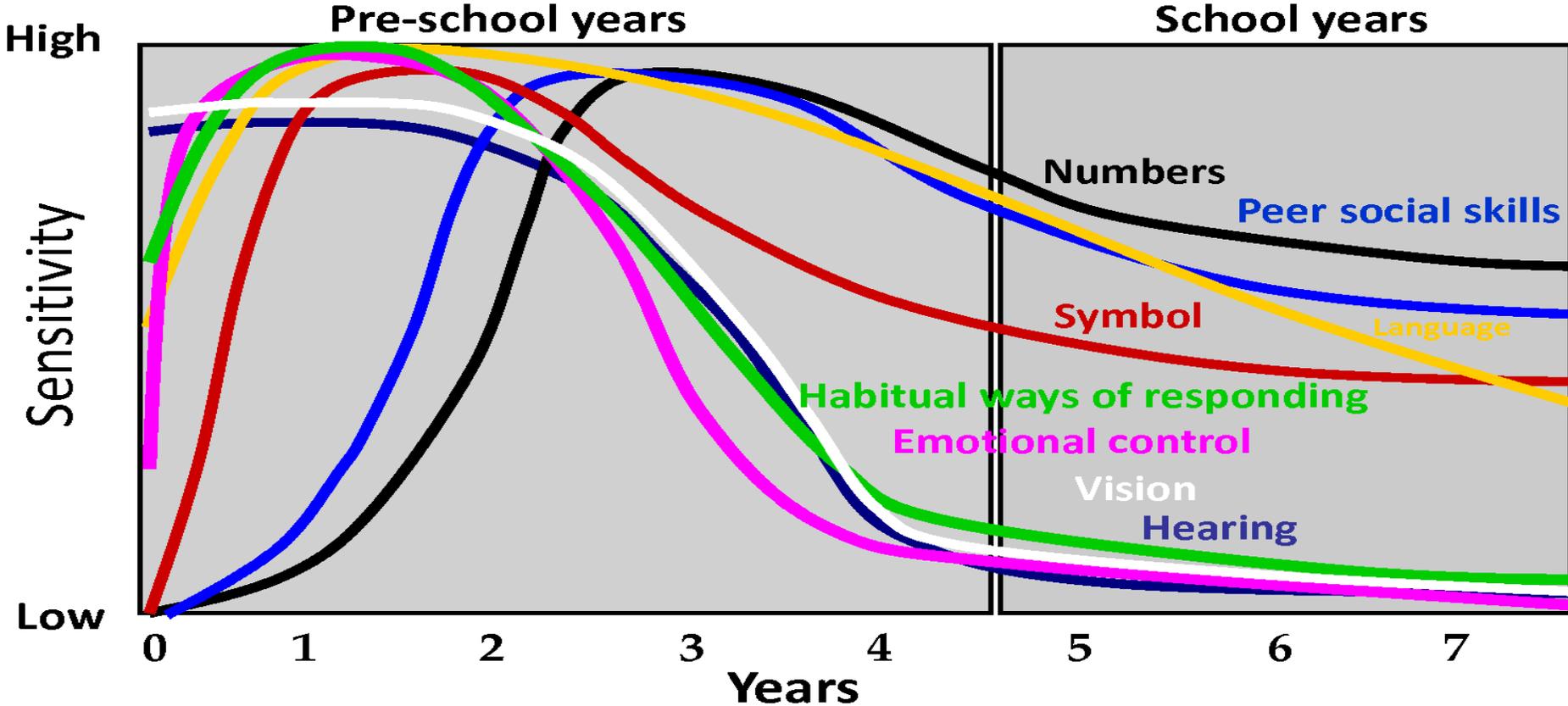


- At birth, each neuron in cerebral cortex has approximately 2 500 synapses
- By two or three years this increases to approximately 15 000 per neuron
- By late adolescence this number is approximately half.

Gopnick et al 1999

USE IT OR LOSE IT!

Sensitive Periods in Early Brain Development



Graph developed by Council for Early Child Development (ref: Nash, 1997; Early Years Study, 1999; Shonkoff, 2000.)

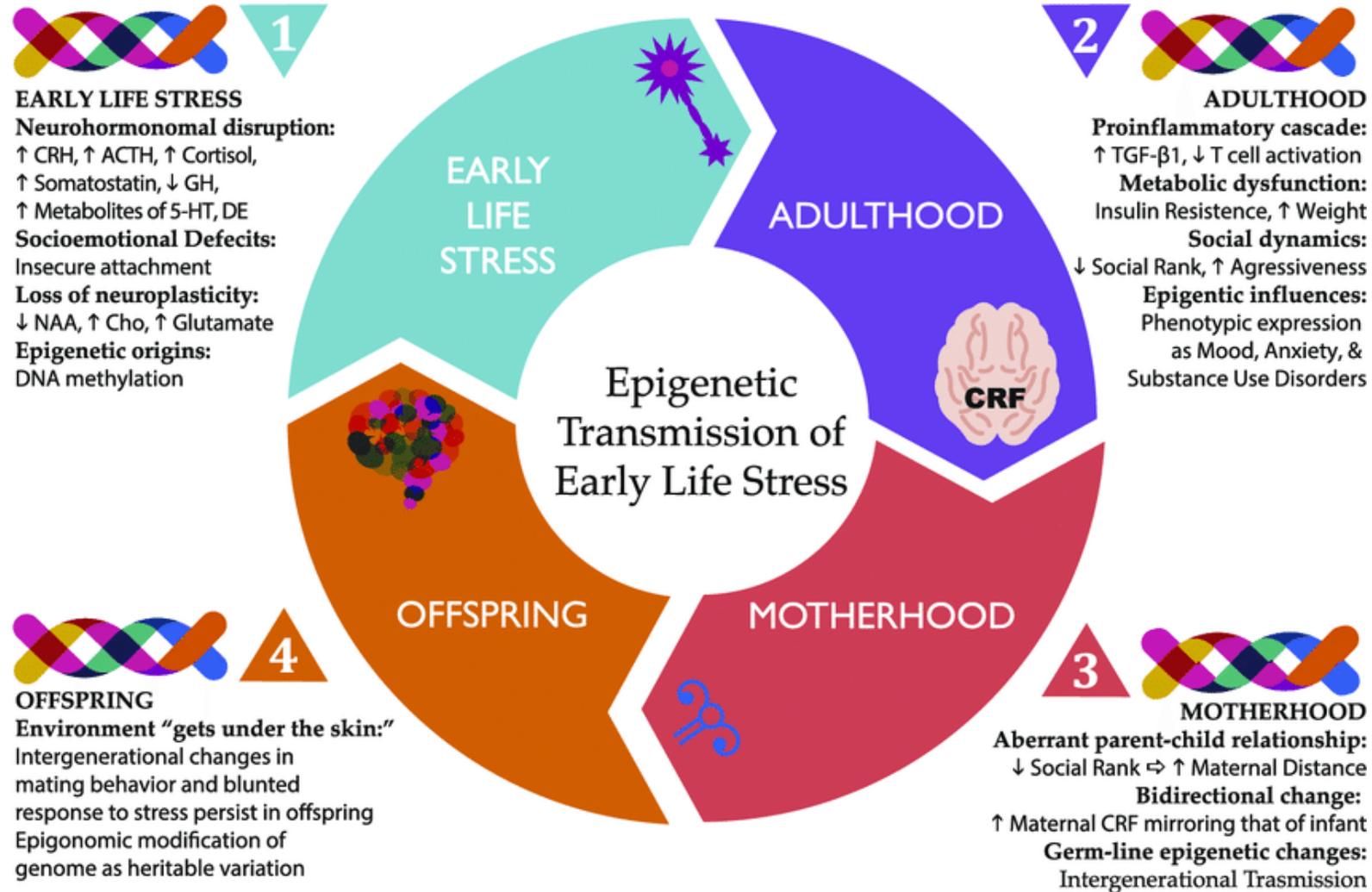
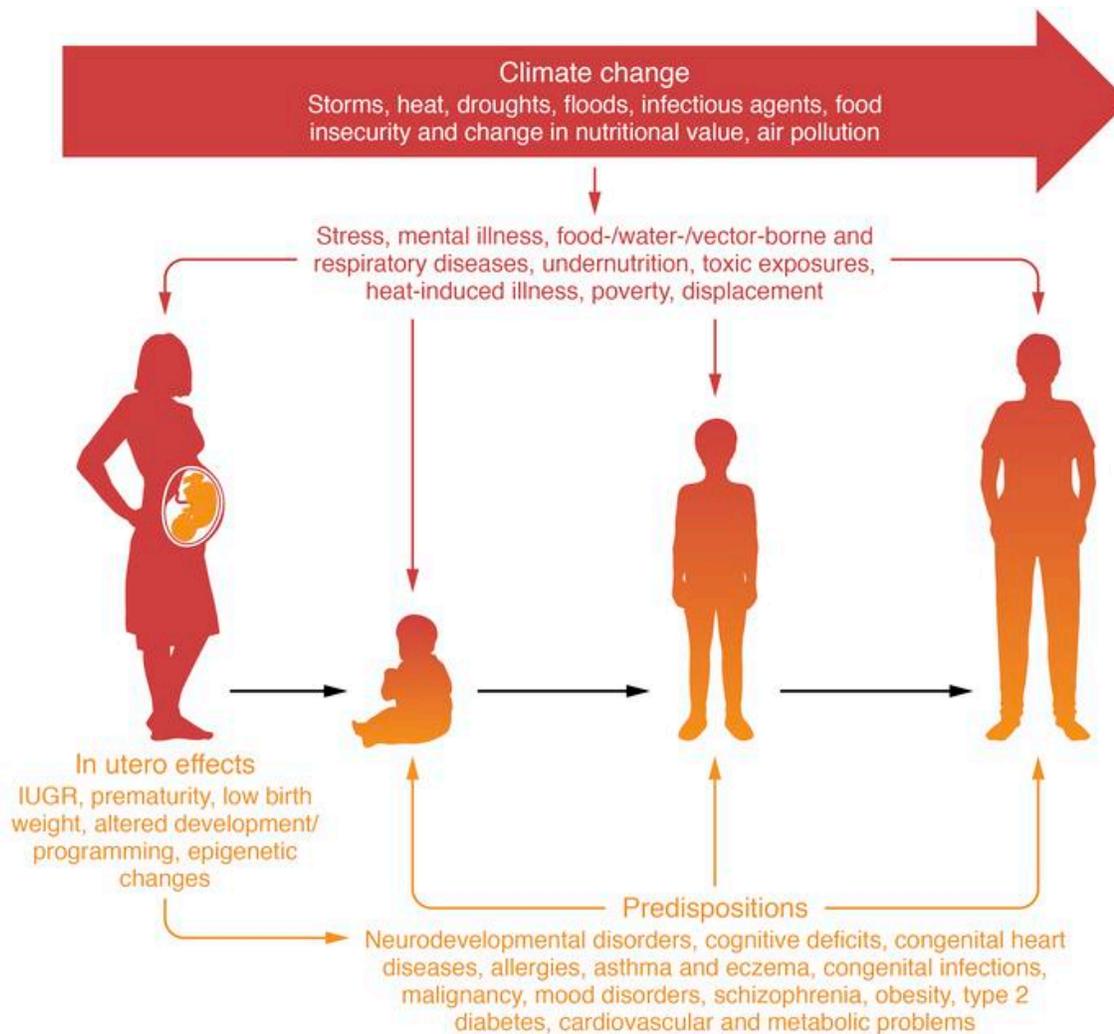


Figure 1 Overview of the epigenetic transmission of early-life stress (ELS). CRF, Corticotropin-releasing factor; ACTH, Adrenocorticotropic hormone; GH, Growth hormone; 5-HT, Serotonin; DE, Dopamine; NAA, N-Acetylaspartate; Cho, Choline-containing compounds; TGF, Transforming growth factor.



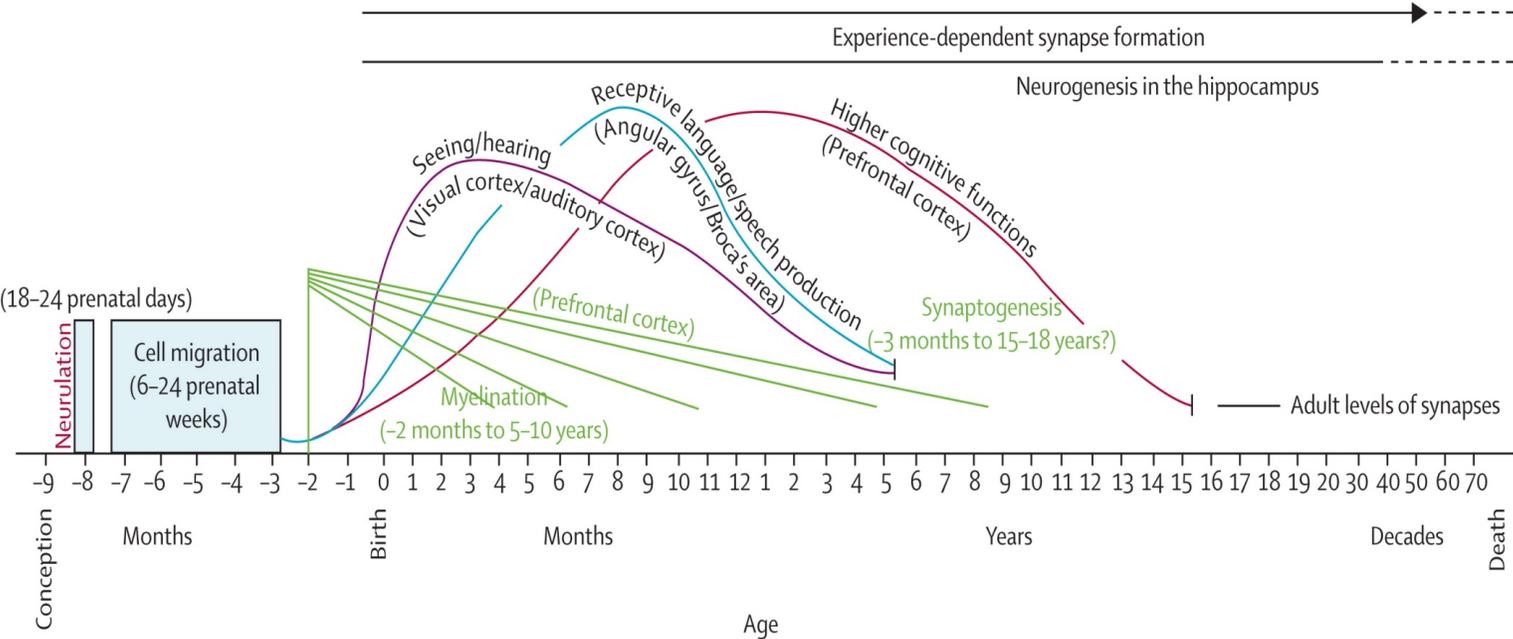
Catastrophic effects of climate change on children's health start before birth

NUTRITION IN MALAYSIAN CHILDREN

- SEANUTS STUDY (Poh BK et al BJN 2013) and MYBREAKFAST STUDY (Tee ES et al 2018)
- Prevalence of overweight (9.8 %) and obesity (11.8 %) was higher than that of thinness (5.4 %) and stunting (8.4 %)
- Almost half the children (47.5 %) had vitamin D insufficiency
- More than one-third did not achieve the Malaysian RNI for energy, Calcium and Vitamin D
- Milk intake in school children approximately 5%
- Increased consumption of sugary beverages

NUTRITION IN BRAIN AND VISUAL DEVELOPMENT

Human brain development



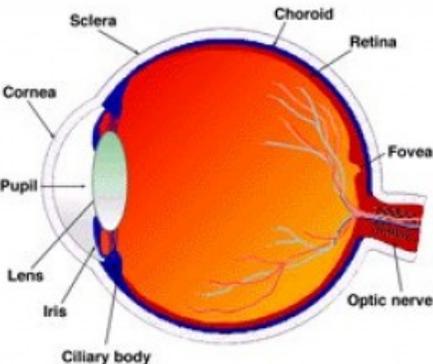
Structure:

Folic acid, B12, Zinc, Choline, Protein, LCPUFA, Phospholipids

Myelination and Synapse Formation:

LCPUFA, Gangliosides, Sphingomyelin, Choline, Iron, Iodine, Copper, Protein

Neurotransmitter synthesis and release:
Choline, Zinc, Copper, B6, Taurine, Iron, Gangliosides, LCPUFA



MFGM

Outer lipid trilayer

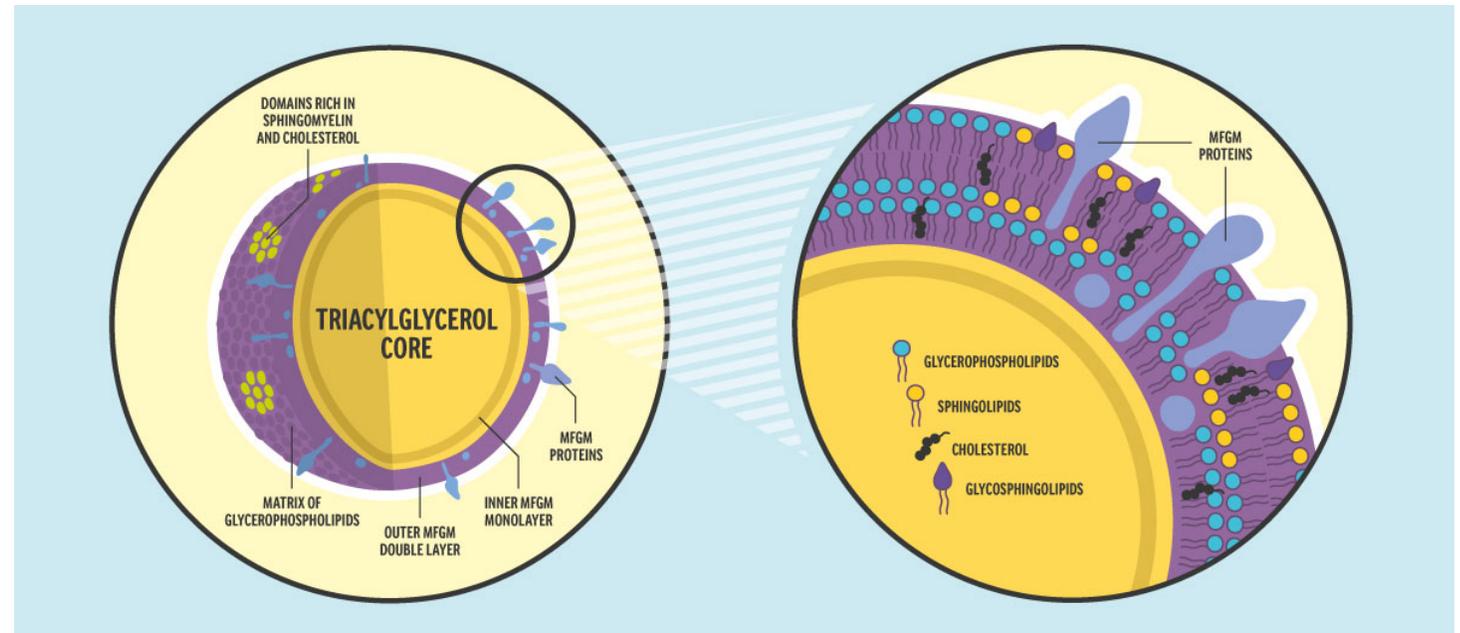
Comprises a complex mixture of 60% proteins and 40% lipids:

Phospholipids, glycolipids, proteins, and glycoproteins, along with cholesterol and other lipids

Functions to stabilize the globule as an emulsion

Inner fat core of triacylglycerols which also contains DHA and ARA

Positive effects on brain development, gut health and immunity when supplemented in growing up formula



ROLE OF GROWING UP MILK

- Children in Malaysia do not drink enough milk or consume enough dairy
- Vitamin D and Calcium intake is low in our children
- Is there benefits of giving growing up milk formulas?



PEDIATRICS[®]

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Article

Follow-up Formula Consumption in 3- to 4-Year-Olds and Respiratory Infections: An RCT

Fei Li, Xingming Jin, Bryan Liu, Weihong Zhuang and Deolinda Scalabrin

Pediatrics June 2014, 133 (6) e1533-e1540; DOI: <https://doi.org/10.1542/peds.2013-3598>

OBJECTIVES

- To evaluate the effect of follow-up formula (FUF) containing DHA, the prebiotics PDX and GOS, and yeast β -glucan on the incidence of respiratory infections and diarrheal disease in healthy children

METHODOLOGY

- Double-blind, randomized, controlled, prospective trial, 3-4 year old children fed 3 servings per day of either a FUF or an unfortified, cow's milk-based beverage (control) for 28 weeks

PRIMARY OUTCOMES

- Fecal and blood samples were collected to assess immune markers and iron/zinc status
- Incidence of acute respiratory infections (ARI), diarrheal disease, and antibiotic treatment from medical records

RESULTS

- FUF group had fewer episodes and shorter duration of ARI (mean days [SE]; control = 4.3 [0.2]; FUF = 3.5 [0.2]; $P = .007$), less antibiotic use (n [%]; control = 21 [14%]; FUF = 8 [5%]; $P = .01$), and fewer missed days of day care due to illness
- No diarrhoeal illness in both groups
- FUF group had higher interleukin-10 and white blood cell count at the end of the study. There were no differences in hemoglobin, serum ferritin and zinc, or fecal secretory immunoglobulin A



Contents lists available at ScienceDirect

Nutrition

journal homepage: www.nutritionjrn.com



Applied nutritional investigation

Milk fat globule membrane (INPULSE) enriched formula milk decreases febrile episodes and may improve behavioral regulation in young children

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Koen Dewettinck Ph.D.^b, Dirk Deboutte M.D., Ph.D.^c, Robert-Jan Brummer M.D., Ph.D.^d,
Marc Boone^e, Pasale Le Ruyet Ph.D.^f

OBJECTIVES

- Evaluate whether the consumption of an MFGM-enriched milk would be protective against GI and other infections, intestinal discomfort and whether behavioral changes could be observed.

Primary Endpoints

- Fever (>38.5C)
- Diarrhea (> 3 liquid stools/day)
- Coughing (> 3 bouts per day)
- Constipation (> 3d w/o stools)

Secondary Endpoints

- Number of doctor visits
- Medication intake
- Number of missed schooldays
- Acceptability of the test drinks
- Safety

METHODOLOGY

- Prospective, double-blinded, randomized controlled trial; 182 children; 4mos
 - **Placebo group:** daily intake of a 200-mL chocolate formula milk w/o phospholipids
 - **Intervention group:** daily intake of 200-mL chocolate formula milk enriched with 500 mg of phospholipids with the addition of 2.5% of INPULSE
- Data were collected from parental diaries

Behavior assessment

- Achenbach System of Empirically Based Assessment questionnaires (ASEBA)
- The gold standard for assessing emotions and behavior in preschool children

RESULTS

- No difference between groups for diarrhea, constipation, cough, doctor visits and days of school absence
- There was a significant difference in the number of days with short febrile episodes – intervention group reporting lesser number of days vs placebo group; difference became significant after 6WK of consecutive intake

Outcome parameters

Supplement	Fever	Diarrhea	Constipation	Coughing	Doctor visit	Medication	School missed
Placebo							
Mean	2.60	1.72	0.42	14.41	1.14	16.88	3.09
SD	3.06	2.83	1.68	13.46	1.42	21.40	3.89
IMPULSE							
Mean	1.71	1.51	0.39	14.89	1.11	14.32	2.47
SD	2.47	2.40	1.77	17.37	1.38	18.82	3.30
Total							
Mean	2.18	1.62	0.41	14.64	1.13	15.68	2.80
SD	2.83	2.63	1.72	15.37	1.40	20.22	3.63
Difference (IMPULSE versus placebo)	-0.89	-0.22	-0.03	0.48	-0.04	-2.56	-0.62
Difference versus placebo (%)	-34.34	-12.53	-8.15	3.34	-3.36	-15.16	-20.12
P*	0.028	0.890	0.844	0.445	0.965	0.516	0.431

* Significant at $P < 0.05$.

Results

Behavioral change

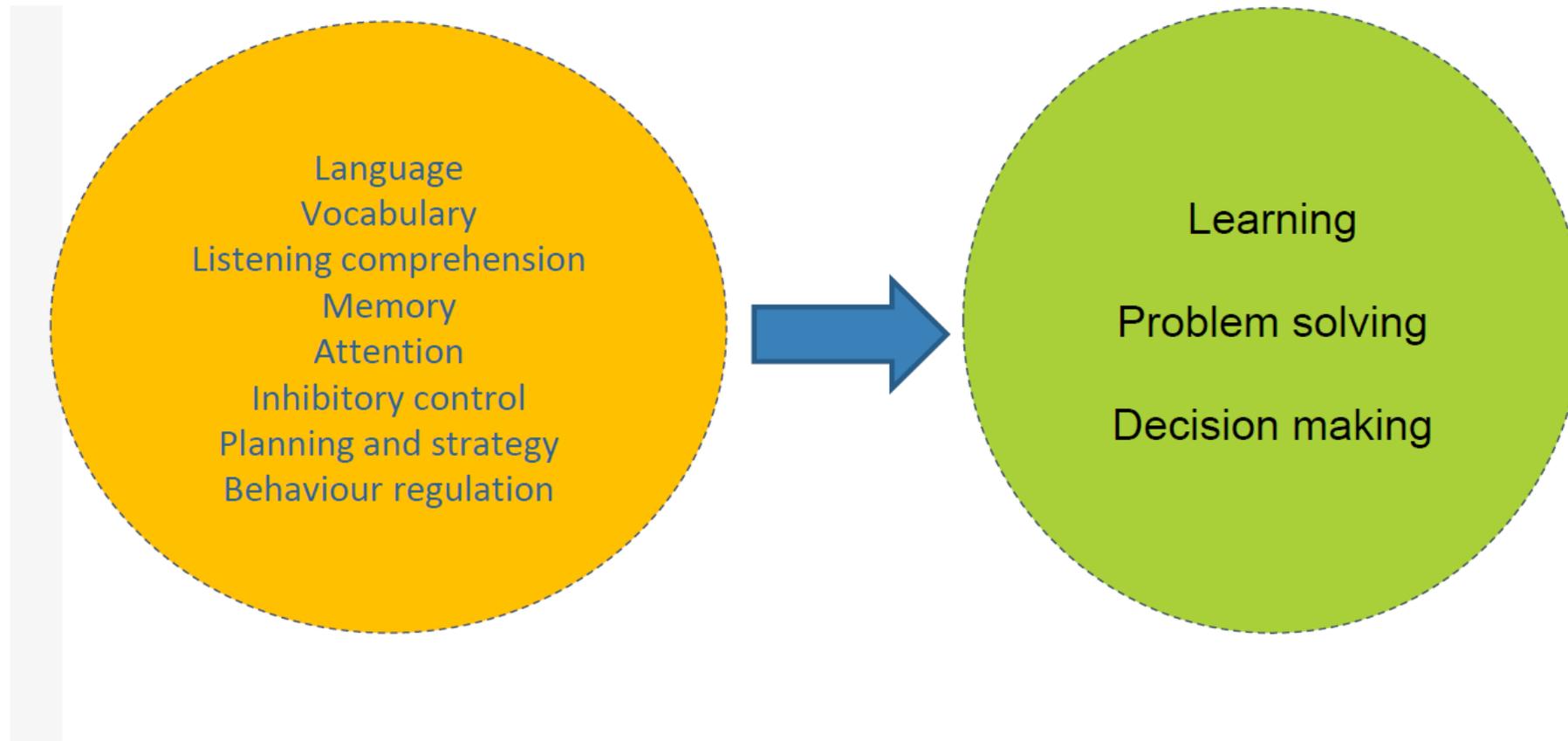
- 169 parents answered the questionnaires
- The parents' evaluation suggested that the emotional and behavioral regulation of the children having consumed the MFGM concentrate (INPULSE) for 4 mo was better compared with the control group.

absence) were similar in the two groups. An analysis of the 169 Achenbach System of Empirically Based Assessment questionnaires (two-tailed t test) showed significant differences in the internal ($P < 0.003$), external ($P < 0.004$), and total ($P < 0.002$) problem scores in favor of the intervention group. Between-subjects effects were highly correlated (internal, $P < 0.003$; external, $P < 0.005$; total, $P < 0.002$, one-way analysis of variance).

Benefits of Growing Up Milk

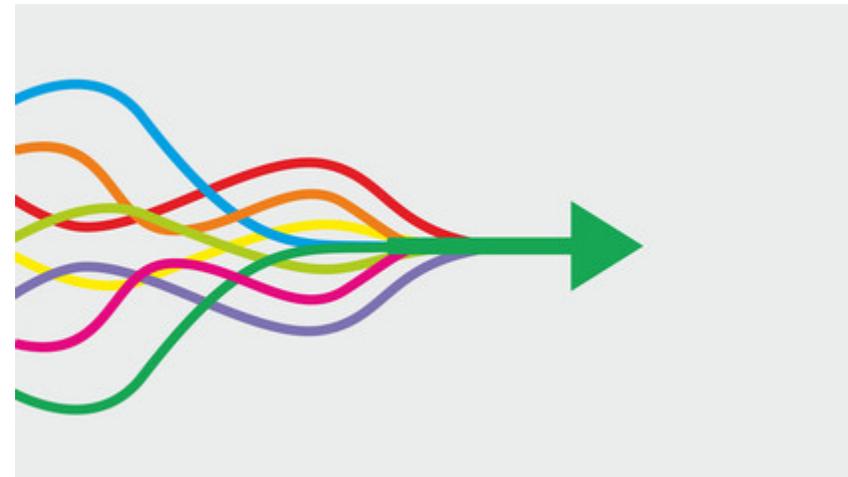
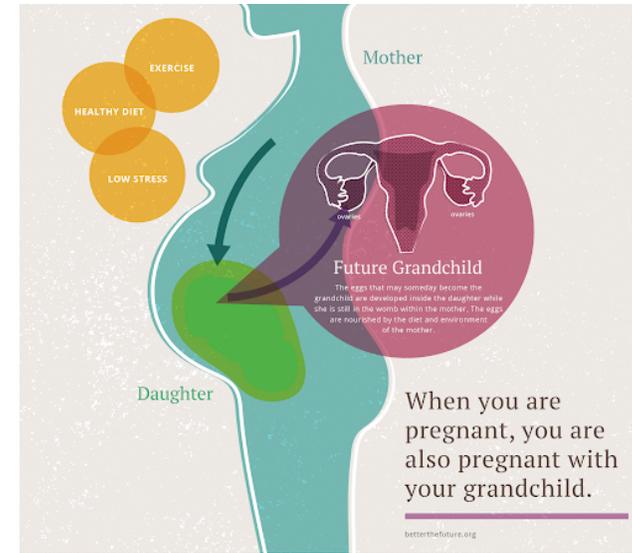
- Reduced incidence of acute respiratory infections and less antibiotic use
- Reduced number of days of short febrile illness
- May improve emotional and behavioural regulation when consumed for longer periods
- Possible indirect effects – less days off work for parents

Cognition, Emotional and Social Development



TO CONCLUDE

- Let's think beyond the first 1000 days
- Nutrition, Stimulation, Enriching Experiences and Attachments Provided by Nurturing Parents and Caring Communities



*It is easier to build
strong children than to
repair broken men.*

~Frederick Douglass

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