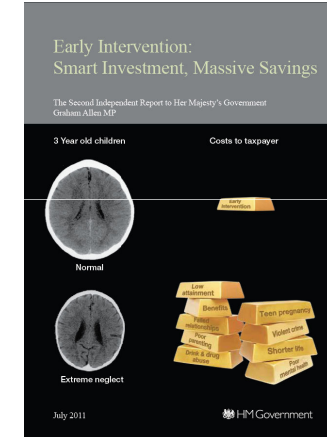
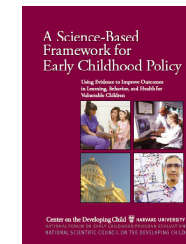
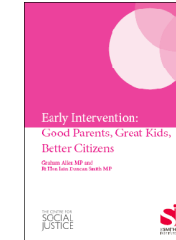


U The Problem of Infant Neurodeterminism B

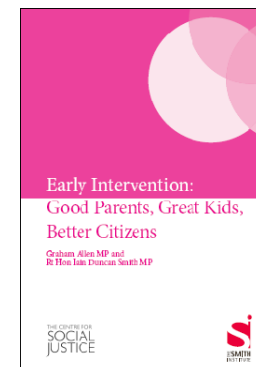
Stuart WG Derbyshire

A Slew of Reports

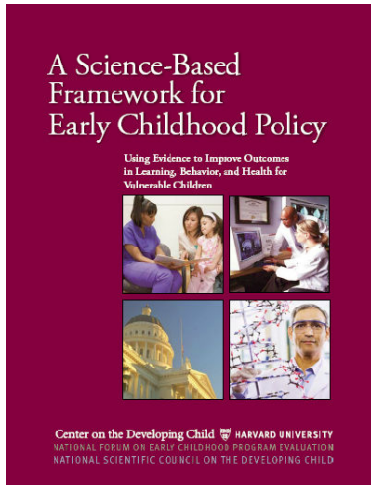


United by...

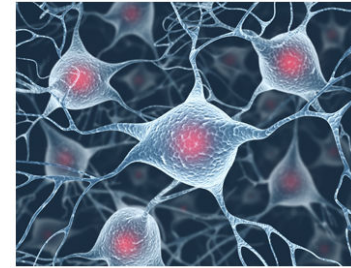
- The first three (or five) years are vital
- What happens in these early years is 'written into the brain'
- Get it wrong and the child will lack empathy and the capacity to learn ushering in crime and poverty



Allen and Smith argue that there is a “sheer predictability of children’s early years for their future outcomes... if a child is born into a home where they are nurtured, where conversation takes place, where someone reads to them then, quite simply, their brain develops properly... it is in that delicate and vulnerable period [0-3 years] that our lives can be made or not.”



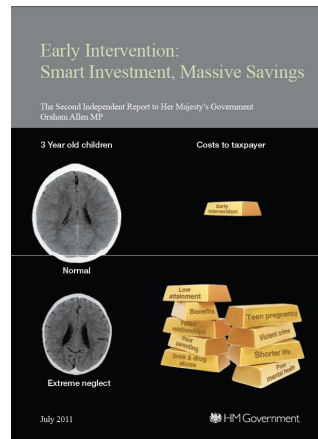
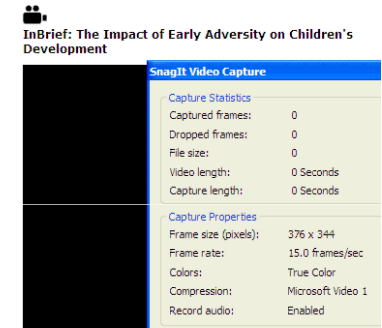
The report argues that there have been exciting new developments in neuroscience that we must capitalise on “to build a strong foundation for improved learning and behavior that will produce better outcomes in academic achievement, economic productivity, responsible citizenship, and successful parenting of the next generation.”



The Science of Early Childhood

Neuroscience, molecular biology, and genomics tell us that early life experiences are built into our bodies. They get under our skin and into the brain and other organ systems, with lasting effects on individuals, communities, society, and the economy. Children subjected to poverty, violence, or neglect during these early years without a supportive network of adults can end up with faulty “wiring” that has long-term consequences well into adulthood. Experiences during the first few years of life – good and bad—literally shape the architecture of the developing brain. Stable, positive relationships with adults and growth-promoting experiences are key to the development of the architecture that forms the foundation for all future learning, behavior, and health. [More >](#)

<http://developingchild.harvard.edu/initiatives/council/>



Early Intervention investment has the potential to make massive savings in public expenditure, reduce the costs of educational underachievement, drink and drug abuse, teenage pregnancy, vandalism and criminality, court and police costs, academic underachievement, lack of aspiration to work and the bills from lifetimes wasted while claiming benefits.

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Consequently...

- Educating parents about the early years is vital
- Parents will need training to address early year needs



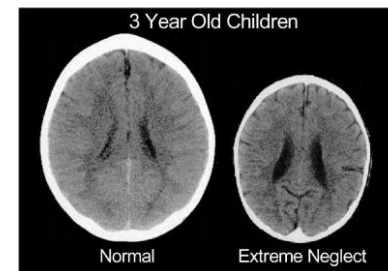
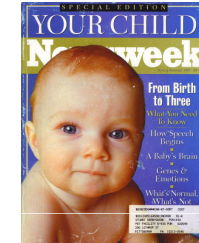
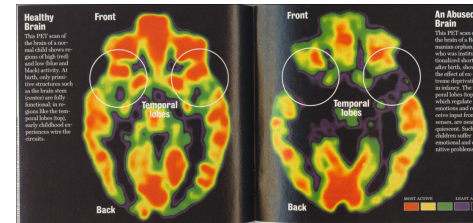
What is required, in short, is a significant societal attitude shift (akin to those involving seat belt wearing and drink driving) towards recognising that parenting is something that has a societal aspect and importance and about which it is socially acceptable for people to seek advice, learn and improve.

What is the Science?

- Case studies and group studies of severely abused infants
- Studies of animals chronically deprived of sensory input

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Case Studies: Bruce D. Perry



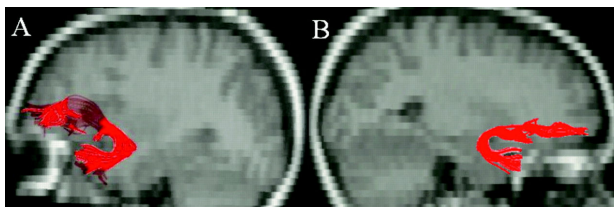
Brain and Mind 3: 79-100, 2002.
© 2002 Kluwer Academic Publishers. Printed in the Netherlands.

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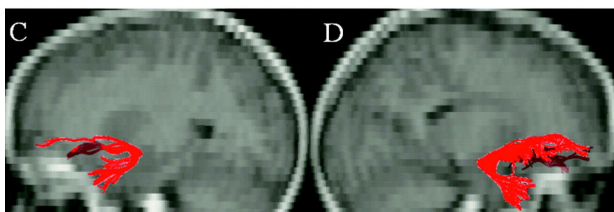
Childhood Experience and the Expression of
Genetic Potential: What Childhood Neglect Tells
Us About Nature and Nurture

BRUCE D. PERRY
The ChildTrauma Academy, 5161 San Felipe, Suite 320, Houston, TX 77056, USA
(E-mail: ChildTrauma1@aol.com)

Brain Connectivity



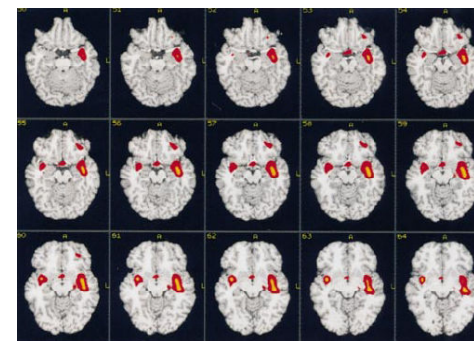
Normal child



Severely
deprive child

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Brain Function



Children (mean age 9 yrs) placed into a Romanian orphanage by 6 weeks of age for a mean duration of 38 months before adoption compared with a control group of non-institutionalised infants

There is reduced glucose metabolism in and around the hippocampus

Chugani et al (2001) *NeuroImage* 14: 1290-1301

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Cognitive and Behavioural Abilities

	Mean	Std. Deviation
Full scale IQ (FSIQ)	92.49	17.01
Verbal Comprehension Index (VCI)	93.40	17.34
Percept. Organizational Index (POI)	94.80	18.62
Freedom from Distractibility Index (FDI)	86.29	18.12
Processing Speed Index (PSI)	99.05	19.05
Verbal Memory Index	81.95	17.02
Visual Memory Index	94.19	17.62
Expressive Language Processing	87.34	20.40
Receptive Language Processing	84.01	23.37
Sustained Attention	83.11	35.26
Impulsivity*	78.46	36.00
Reading	91.89	19.23
Spelling	89.69	17.72
Arithmetic	87.84	19.04
Manual Dexterity - Dominant Hand	86.39	43.45
Manual Dexterity - Nondominant Hand*	83.76	38.05

Children (mean age 9 yrs) placed into an orphanage for a mean duration of 29 months before adoption. Normal children average 100 for each measure (SD = 15)

Behan et al. *Child Neuropsychology* 2008; 14: 453-469

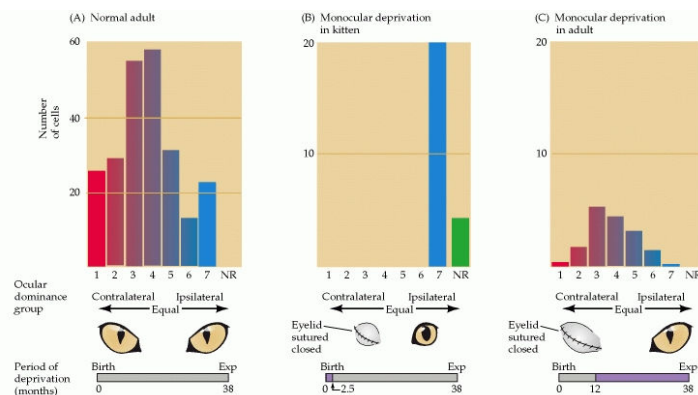
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Summary

- Infants placed in a severely deprived environment (mostly Romanian orphans) for the first 3 years of life have changes in brain connectivity and function, reduced cognitive ability and increased behavioural problems at age 9

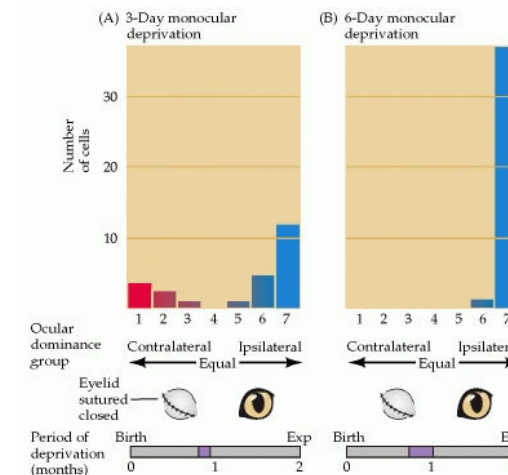
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Kittens Deprived of Visual Input



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Critical Periods



Three days of monocular deprivation before one month of age causes a shift of cortical innervation to favour the non-deprived eye

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Extrapolation From the Severe to the Normal is Unwarranted

- It is not surprising that infants who spend 23+ hours per day in isolation have learning and behavioural problems
- Bruce Perry writes about overt childhood abuse and infants raised in orphanages and then says:

“...recent inadvertent impacts of technology have spawned declines in extended families, family meals, and spontaneous peer interactions”

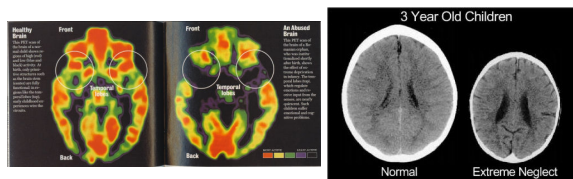


Extrapolation From the Severe to the Normal is Unwarranted

- Being caged in a crib all day is not the same as missing a family meal (!) or being ignored or neglected

Extrapolation From the Severe to the Normal is Unwarranted

- Typical families do not isolate their children for 23+ hours a day and do not sew up their children's eyelids...
- It is incorrect (dishonest) to imply that if severe neglect causes a large problem, lesser 'neglect' causes a lesser problem



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Normal Family Interactions are Good Enough

- Delayed response task
 - Measures the emergence of representational memory
- Dependent upon development of DLPFC
- Repeat testing with delayed response results in small short term gains
 - No advantage from repeat testing after 12 months
 - Memory develops at approximately the same rate regardless of 'enrichment'



Diamond A, Goldman-Rakic PS. *Experimental Brain Research* 1989; 74: 24-40

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Normal Family Interactions are Good Enough

- Newborns can discriminate the sounds found in all human languages
 - By ten months infants more readily respond to the sounds (phonemes) particular to their native language
- The critical requirement for phoneme recognition is the shared perception of communicative intent (aka talking)
 - TV is no good
- 1-2 hours talking a day is considered enough
 - No evidence that flash cards at 3-months or other types of 'enrichment' provide any advantage



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Kuhl PK *et al.* (2003) *Proceedings of the National Academy of Sciences, USA*; 100: 9096-9101

Summary

- Severe deprivation causes problems
- Normal family interactions are not comparable
- Deprivation can be overcome

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All is not lost...



Lex feels completely English, although he was born in Romania

- At adoption, 70-90% of children leaving severe deprivation have global impairment
- A few years after adoption, that figure drops to 14-36%
- It's no picnic, severe problems often remain, but dramatic improvements have been recorded



“Contrary to popular opinion at the time, we found there were definite long-term effects from being in an institution”
Professor Michael Rutter

Behan *et al.* *Child Neuropsychology* 2008; 14: 453-469

And if severely deprived children can catch up...

Family Status	Actual Differences in <u>Quantity</u> of Words Heard
Welfare	616 words
Working Class	1,251 words
Professional	2,153 words

- Some children hear fewer words but this can be addressed at any time
 - Anyone can make positive changes in their life by learning a new language, working abroad, volunteering, etc, and discover aptitudes and skills they never had before. Regardless of what happens in the first five years of life there are always opportunities and possibilities for further development

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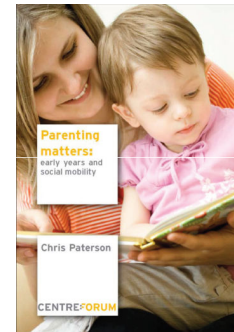
An Abuse of Science

- Children who grow up relatively deprived, with little access to books and poor schooling, are in no way comparable to the children from Romanian orphanages or to animals completely denied sensory input
- The typical inadequacies of early years can be addressed later in life
- Any descent into antisocial behaviour, crime, educational failure, poverty or negative physical or mental health cannot be explained away as the inevitable consequences of irreparable brain damage caused by early years deprivation



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“5-a-day for development”



- 1) Read to your child for 15 minutes
- 2) Play with your child on the floor for 10 minutes
- 3) Talk with your child for 20 minutes with the television off
- 4) Adopt positive attitudes towards your child and praise them frequently
- 5) Give your child a nutritious diet to aid development

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Negative Effects of “5-a-day for development”

- Further isolates parents
- Disrupts normal family life
 - Parenting is instrumentalised and parents can no longer trust their instincts
- Undermines adult responsibility
 - Negative behaviour is now the consequence of decisions made on your behalf before your fifth birthday
- Invites authoritarian intervention



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Conclusion

- Severe deprivation has negative consequences but that provides no information about typical development
- Science cannot guide parenting because the science is not good enough and parenting is not a science project
- Attempts to guide parenting are an authoritarian effort to impose middle class parenting practices

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