

The nouns, adjectives and verbs that link brain science with policy and practice

Science about how the brain functions captures the public, political and policy imagination. Bruce Perry's neuroimages contrasting the brains of two three-year old children, one normal size, the other shrunken by maltreatment, has galvanised politicians in North America and Europe. Understanding the way in which *in utero* and infant brains respond to external stimuli in the 1990s had policy makers pressing for mothers to play Mozart to their unborn and recently born children.

There has been an explosion of knowledge in the last two decades about the brain, the way it is wired and the way it re-wires itself. In reality we still know relatively little about how the brain develops, and why. Despite artful images produced by magnetic resonance imaging, most of what is known comes from the dissection of, and experiments with, the brains of chimpanzees and rats.

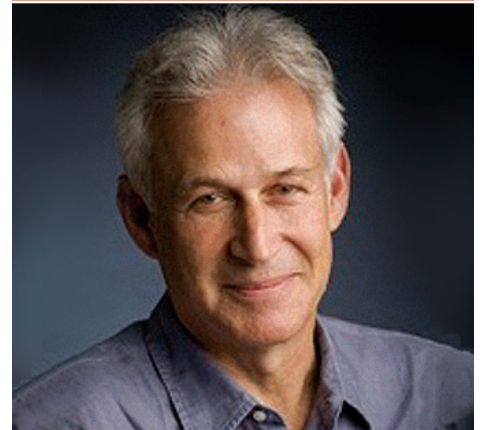
It is now clear that brain development begins before birth and continues until death. Development implies growth, but in the case of the brain it also involves pruning. Synapses open and they also close at successive stages in life.

There are what are called sensitive periods, when a lot of change is taking place, when many of the brain's wires are being plumbed or re-routed. Upsetting the standard building processes in these sensitive periods risks leaving some wires hanging loose permanently, or badly connected. By default, there are also less sensitive periods, times when less change is occurring.

It is pretty obvious that at least one of these sensitive periods is taking place in the first three years. Just looking at the huge growth of the brain in the early years is sufficient indication of the amount of change that occurs.

Some people take these data and wrongly assume that getting it wrong in the first three years has catastrophic implications for the rest of a child's life. It is reasonable to hypothesise that exposure to violence, for example in early infancy over stimulates neural pathways leading the child to grow up ready to defend itself against external threats, sometimes with effective...
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Center on the Developing Child, Harvard University



Jack Shonkoff, MD (above) is the Director of the Center on the Developing Child at Harvard University in the United States.

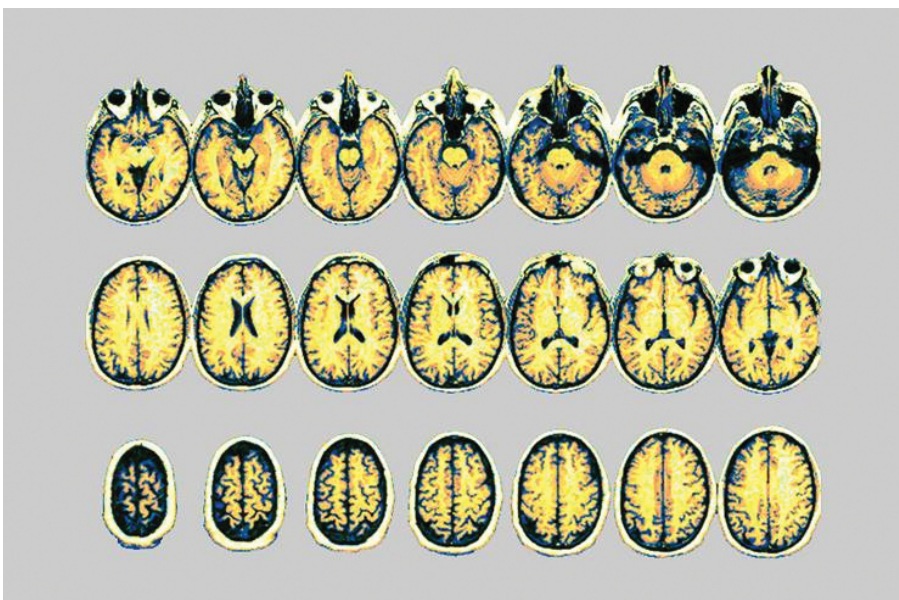
The center generates, translates, and applies knowledge in the service of improving life outcomes for children in the United States and throughout the world.

Founded in 2006, the center was set up to leverage science to enhance child well-being through innovations in policy and practice.

The center is committed to four main areas of work:

- Building a multidisciplinary science of health, learning, and behaviour to elucidate causal mechanisms that explain the early roots of lifelong impairments.
- Advancing their understanding of the reduction of preventable disparities in well-being through rigorous analysis, design, implementation, and evaluation of innovative programs and practice models.

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The nouns, adjectives and verbs that link brain science with policy and practice continued...

...strategies but often with less effective strategies. Although this hypothesis is far from proven.

It is clear that a child's vision and hearing are formed in the early critical period. But other functions, such as the intellect, social and emotional development, are subject to change across childhood and into early adulthood. The first three years are important and society must do all it can to protect its' young from unnecessary stress. But early damage is not the end of the story.

The presenter of the 2011 Annual Lecture, Jack Shonkoff, has devoted his professional career to understanding child development, and to promoting a rounded, sensible, and reliable description of what is and what is not known.

For Shonkoff, the issue is not about intervening early or late in a child's life, but doing all that is most appropriate at each stage in a child's development. The challenge is making what little is clear or probable about the childhood brain, useful to those of us in society who have responsibilities for raising children.

For Shonkoff the ramifications of brain science are not just public policy that better nurtures optimal development across childhood and adolescence, but also the behaviour of every parent, the way in which employers support parents in the workforce, and even the way we zone our limited land-space.

Society as a whole influences the potential for children to have stable, positive relationships, safe and supportive environments and appropriate nutrition. Relationships, environments and diet bear on the way the brain wires and re-wires itself across childhood.

A driving force in Shonkoff's work therefore is the appropriate use of science in decisions that make a difference to child well-being. Different parts of society have different relationships with the science. Scientists are interested in questions, and about what is unknown or uncertain. Policy makers and practitioners are required to deliver answers and to make decisions based on available, but frequently very limited, information.

Getting society to embrace and make better use of the science of brain

development therefore requires finding common ground and common language, and finding the nouns, verbs and adjectives that will make the growing evidence-base useful to people whose decisions bear on how children are raised.

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Shonkoff's writing's for example have attempted to set out shared definitions of key terms and concepts such as brain architecture and toxic stress. Good communication is eased by finding agreement about what is and what is not true. Shonkoff divides knowledge up into established knowledge, reasonable hypotheses and unwarranted assertions.

That the foundations for the sensory systems are laid in the first few years of life is sufficiently clear to count as established knowledge. The situation with respect to social and emotional regulation is far more ambiguous. It is reasonable to hypothesise, given the current sum of knowledge, that the symptoms of trauma seen in children who have been repeated victims of violence are due to the impact on brain structure and function. But there is, as yet, no proof. And it is unwarranted to assert that victims of maltreatment sustain irreversible brain damage that leads them to struggle with relationships and emotions.

This year's Social Research Unit Annual Lecture will therefore give participants an opportunity to clarify the current state of play with regard to brain science. It will provide an evolved argument regarding the value that might be placed on successive stages in a child's development from conception to early adulthood. The evidence will be related to the way in which society can nurture and threaten the development of future generations, examining not just what governments do in the enactment of new legislation but also how communities, schools, and families can make a difference.

Center on the Developing Child, Harvard University continued...

- Catalyzing the creation of effective, science-based policies and practices through strategic relationships and enhanced capacity for knowledge transfer.
- Preparing future and current leaders to build and leverage an integrated, interdisciplinary knowledge base that promotes the healthy development of children and families and brings high returns to all of society.

Shonkoff is also the Julius B. Richmond FAMRI Professor of Child Health and Development at the Harvard School of Public Health and the Harvard Graduate School of Education; Professor of Pediatrics at Harvard Medical School and Children's Hospital Boston; and Founding Director of the university-wide Center on the Developing Child at Harvard University.



Event location:
Royal Society of Medicine

He also chairs the National Scientific Council on the Developing Child, a multi-university collaboration comprising leading scholars in neuroscience, psychology, pediatrics, and economics, whose mission is to bring credible science to bear on policy affecting young children.



The Social Research Unit's Interest in this Area

The Social Research Unit seeks to bridge science, policy and practice that influences children's health and development. The rapidly changing evidence-base about brain development provides many opportunities for society to better nurture child well-being, and it also creates a potential for confusion.

The decision to invite Jack Shonkoff to deliver the 2011 Annual Lecture reflects a perceived need to increase both the quantity and quality of discussion about the way in which society can better nurture a core element of healthy child development.

Much has been done in the last decade to improve the conditions in which pre-schoolers are raised, with better maternity and paternity leave, the introduction of Sure Start/Children's Centres into every disadvantaged community in England, and the greater availability of evidence based programmes like Family Nurse Partnership.

Less attention has been given to the opportunities for better intervention when the brain is re-wiring itself ahead of puberty or in early adulthood. Moreover, at all stages of childhood, the primary focus has been on what governments might do, when the evidence also points towards things that families, schools, neighbourhoods and workplaces do that



can alter the architecture and function of our children's brains.

A recurring theme in the Social Research Unit's work in the last decade has been to bring a higher standard of evidence to bear on public policy and professional practice. Brain science has too often been misused by well-meaning people deciding on a desired course of action and then looking for research to support that course.

By bringing one of the world's leading scientists to deliver this year's Annual Lecture, the SRU hopes to increase the respect given to the existing knowledge base, including an acknowledgement of how

little is known and how much more research is needed, and also encourage a broader outlook on how sound science can influence the way we bring up our nation's children.



Public Policy Relevance

Despite significant new investment over the last decade in children's services, the well-being of children in the UK lags behind that of many rich countries, and the health and development of children living in economically deprived settings lags a long way behind the national norm. These trends are evident in comparative studies of children's behaviour and emotions over the last three decades.

The data are worrying, but when the physiology of the brain is implicated the situation can appear shocking.

The UK government has commissioned several reviews of the way our society brings up children, leading to renewed attention to the rapidly changing science of brain development.

Foremost among these has been Graham Allen's Review of Early Intervention, which devoted much space to the subject, reflecting Allen's passion to get a better deal for children born into multi-generational poverty. By the reckoning of this MP and many of his colleagues in parliament, there is a clear link between deprivation and the way the infant brain is formed. In many respects, political policy makers are leading the charge on this issue.

There is also an emerging interest in the quality of science being produced in the UK, and the way it is applied to public policy. Too much national legislation and local government investment has shied away from a thorough examination of the science. In some cases policy makers have decided what to do and then looked for evidence to back up their case.

Jack Shonkoff will not only talk authoritatively about the science of brain development, he will be able to advise on the way science can be better used by policy makers, managers and practitioners.





Events Related to this Issue Brief

Jack Shonkoff will be speaking at several events during his visit in the UK. On the 6th of July, he will present a seminar at the House of Commons.

On the 7th of July, Jack will deliver a talk at the Social Research Unit's 2011 annual lecture at the Royal Society of Medicine, between 6 and 8pm.

Jack will also present at a number of private events, such as a master class for Unit staff, and a lecture to civil servants in Renfrewshire, Glasgow.

Social Research Unit Events Series

The Social Research Unit at Dartington is an independent charity with nearly 50 years of experience in bridging science and public policy for children. The goal of the Unit is to improve children's health and development, demonstrably so.

SRU Goals

It pursues its goals via:

- Research into the causes of poor outcomes and into effective policy and practice
- Development of innovation based on science in real world situations
- Dissemination via a free daily newspaper, *Prevention Action*, and the *Journal of Children's Services*

Recent Speakers

Part of the Unit's charitable commitment is to offer a series of free events for policy makers, practitioners and researchers. Every year, the Unit hosts a lecture to honour the work of a leading scientist or policy maker whose work seeks to improve outcomes for children and families.

Recent speakers have included:

- **Tom Dishon**
Oregon Social Learning Center
2008 Annual Lecture
- **Del Elliott**
Blueprints for Violence Prevention
2009 Annual Lecture
- **Steve Aos**
Washington State Institute for Public Policy, 2010

Forthcoming Events

A collaboration with the Mayor's Fund for London that will lead to a seminar that brought together the business community with leading policy makers and practitioners interested in scaling up effective innovation for children.

In the autumn, the Social Research Unit will host an event to consider the work of Christina Salmivalli from the University of Turku Finland who has pioneered effective ways of reducing bullying in schools.

Events are generally free, and advertised on the Social Research Unit website. Major events are preceded by an Issue Brief and are captured on video that can be viewed at the:

www.dartington.org.uk