

What About The Children?

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'Raising awareness of the never-changing emotional needs of the under-threes in our ever-changing society'

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It's the Relationships Stupid!

This, the 20th anniversary of the foundation of WATCh?, is a special year when we look back to the remarkable vision of the founder. In February 1993, at the height of the Jamie Bulger disaster, when national feelings were inflamed, Doreen Goodman was able to see that there was not just one victim, the child who died, but three, as the two child perpetrators were severely damaged too. Her letter in the Guardian in 1993, led directly to the formation of WATCh? as a registered charity.

Human relationships

At that time, in 1992-3, in the American Presidential election, the Democratic team was confused about which of many topics to concentrate on. Then James Carvill, a Clinton adviser, said: "It's the economy stupid!" The Democrats focused on the economy and won. Carvill's phrase became a succinct, if rather blunt, way of describing a top priority. Today, important priority topics are information and technology, but I want to challenge this mechanical approach to life and concentrate on a bigger topic that determines the nature of our society. The essence of any society, at any time, is how people relate to each other, in short: "It's the relationships stupid!"

There are two human relationships of exceptional importance: marriage and parenting, which both involve the most intense feelings that humans experience. These two are the building blocks of families worldwide.

1. Marriage

People who are married experience three major gains: on average they are happier (Govtoday, 2012), they are healthier (Kiecolt-Glaser and Newton, 2001) and they live longer (Kaplan and Kronick, 2006). Hence my letters in *The Times* (Pereira Gray, 2010a) that marriage is a public health issue and the *Financial Times* (Pereira Gray, 2010b) that marriage is research based. Society's lack of support for marriage undervalues relationships.

2. Cohabitation

Cohabitation is fashionable in Britain involving six million couples and if there are no children, it is partly a lifestyle choice depending on religious views. We must however, distinguish between cohabitation with and without children. Parenting through cohabitation, rather than marriage, is fundamentally different. It is common with about 40% of British children affected (Office of National Statistics, 2012). From the child's point of view, this is a second-class arrangement. Cohabiting couples are much less stable, so that the chance of having parents split up by the age five is one in two compared with 1 in 12 within marriages (Duncan-Smith and Callan, 2007).

The most powerful statistics I know providing evidence of the importance of human relationships come from Britain's infant mortality rates (the rate at which British children die in the first year of life). When analysed by the social class of the parents and whether or not the parents were married at the time of the child's birth, it was found that in every social class, fewer children die if their parents are married than if they are not.

Even more strikingly, in a society in which socio-economic differences are seen as overwhelmingly important (Marmot, 2004; Wilkinson and Pickett, 2009), children born into homes in social class four families, with married parents, have a better chance of living to see their first birthday in Britain, than children born into social class one families, the wealthiest group, whose parents are unmarried (Platt, 1997; Child Health Statistical Review).

3. Parenting

The other important relationship is parenting. Whilst important at all ages, there are some windows of time when the development of the child is especially critical. Such a time is the first two years of life. The developing brain doubles in size in the first year (Schore, 2013) and in the second year particularly, numerous delicate nerve connections form patterns within the brain. These patterns will form anyway, so the question is: will they be healthy and stabilising patterns -or not? Crucially, the parts of the brain which control emotional stability, self-control, and conscience form early.

Bowlby's attachment theory

Dr John Bowlby (1907-1990), was a doctor who described "attachment" as the relationship a young child has with its main care-giver, usually the mother. His 1951 and 1958 articles summarised his thinking (Bowlby, 1951, 1958). Later, he wrote major texts such as *Attachment and Loss* (Bowlby, 1969; Bowlby, 1973). We must note that this is a relationship theory.

Attachment theory states that secure, loving, parenting gives the baby emotional security and that lack of it leads to emotional insecurity. Bowlby's work, now internationally recognised, is a great British contribution to knowledge, but it was an intellectually derived theory, not one based on empirical research. This delayed its acceptance, as health professionals asked: "where is the evidence?"

Now is a good time to review the evidence for attachment theory. Here, *What About the Children?* is unusual amongst charities in recognising early the importance of scientific research. This is largely due to the sterling work of one of the Trustees, Diana Dean, who has many scientific articles summarised, and placed on the *WATCH?* website. She has even recruited to this task her scientist husband, Philip! I acknowledge how much I have learnt from her articles and how much I admire their joint work.

Hierarchy in medicine

When Bowlby was writing there was a hierarchy in medicine: physical medicine mattered more than psychological medicine, which mattered more than social medicine. This lingers on. Bowlby, as Deputy Director of the Tavistock Clinic, wrote in the *International Journal of Psychoanalysis* but was not read much by mainstream medicine. To persuade the health professions and national policy-makers of the importance of attachment theory, we must deploy evidence from science journals.

In 2013, fortunately, past hierarchies are dissolving, as boundaries between things physical, psychological, and social have blurred. It is a feature of postmodernism (Hodgkin, 1996) that boundaries blur. This can be disturbing, but in child development it is liberating. Interestingly, Schore (2001), in the 7th Bowlby Lecture, "Minds in the Making", noted that Freud, the father of psychoanalysis, foresaw a rapprochement between psychiatry and neurology. The discovery of hormones helped to reduce distinctions between the physical and the psychological. There are many hormones, chemical substances circulating in the blood that control many effects in the body.

In childbirth, one hormone stands out, oxytocin. This has many functions including stimulating caring feelings in mothers (Esel, 2010). This is nature's way of protecting vulnerable small children and is a way psychological feelings are stimulated by a physical substance. Pedersen and Boccia (2002) showed in rats that when they artificially inhibited oxytocin release rat mothers reduced their care (licking of pups) and groomed themselves more. Secondly oxytocin receptors in the brain when such pups grew up were different and their stress responses were reduced. The implication is that mothering received is linked to the later mothering capacity and adult stress response. Intergenerational patterns may be set.

Mothers and fathers

Bowlby's (1958) article: "the ties a child has with its mother" emphasises mothers. Speaking as a man, I see three fundamental differences between the sexes as parents. First, women become pregnant and carry their child for nine months. Secondly, only women go through child birth, and thirdly, only women breast feed their baby. All three are associated with profound physiological changes in a woman's body, including the release of powerful hormones. None of these three functions are possible for men: only women have these privileges, so the sexes are not the same and policies should take these biological facts into account.

I am certainly not undervaluing fathers. Grossman et al. (2002) reported the value of the child-father attachment and the benefits of fathers' challenging play over 16 years. Belsky, Stewart-Brown and colleagues (2007) showed that the father's presence in the home improves child outcomes.

Evidence from x-rays

X-ray scanning machines have improved medical investigation making it possible to "see" into the body, which has transformed diagnosis. Scanning techniques enable us to see physical lesions in the brain and to test whether these correspond to different behaviours. For example, shrinkage of the hippocampus in the brain occurs in people with schizophrenia, which correlates with the degree of illness (Brambilla et al., 2013). Similarly, brain lesions, called amyloid plaques, in people with dementia also correspond with the degree of disability.

These fascinating findings are not just intellectually interesting, but raise big questions about the nature of disease and the diagnostic labels doctors and nurses use. If brain lesions are visible on x-ray, does that make dementia a physical rather than a mental illness?

Important parts of the developing brain include the frontal cortex and the hippocampus. Studies on seriously ill-treated children in Romania showed that withdrawal of love leads to atrophy of parts of the brain. This shows that psychological deprivation leads directly to physical changes in the brain. This is strong evidence for Bowlby's attachment theory. Those poor children can certainly say: It's the relationships, stupid! However, arguing from extremes is dangerous. What is the general evidence about relationships and small children?

RESPONDING TO STRESS

One protective mechanism in animals and humans is the release of hormones, like adrenaline and corticosteroids, when there is danger. This primes muscles and shuts down the blood circulation in the digestive system. It gives options like "fight or flight", which can be life-saving. This happens through stimulation of the hypothalamus in the brain, which makes the pituitary gland produce a hormone, which stimulates the adrenal gland to release adrenalin. This is the hypothalamic-pituitary-adrenal-axis (HPAA). Hormone release in an emergency is obviously beneficial. But can hormones like cortisone also do harm?

1. Animal studies on cortisol

The effects of cortisol have been researched in both animals and humans. First animal studies. One early report was Uno et al. (1990) who found that giving cortisone to monkeys before birth, damaged the brains of the offspring. The same year, Sapolsky and Uno (1990) reported that the damage in primates caused by cortisone could be located to the hippocampus, a part of the brain where memory and spatial understanding are organised. Sapolsky (1997) later summarised the effect of stress on the brain and Gilbertson et al. (2002) found that smaller hippocampi predicted pathological vulnerability to psychological trauma.

Next, Watanabe et al. (1992) showed that when rats were stressed the apical dendrites of the hippocampi atrophied, but not the basal dendrites. This confirmed that the hippocampi are vulnerable to stress. Dunlop et al. (1997) showed that repeated use of pre-natal corticosteroids led to delayed myelination in the bovine nervous system. Huang et al. (1999) found that lambs whose mothers had been given repeated doses of corticosteroids had significantly lighter weight brains. Quinlivan wrote three articles (Quinlivan et al., 1999; Quinlivan et al., 2000a; Quinlivan et al., 2000b) about the effect of cortisone in sheep. They found that single doses of cortisone had no effect, but multiple doses

given to the mother before birth were associated with delay in myelination (coating of the nerve cells) in the brain of the lamb, particularly in the sciatic nerve, and that maturation of the retina in the eye was delayed. More recently, Moss et al. (2005) reported that repeated use of betamethasone (a corticosteroid like compound) in pregnant sheep led to a: "persistent deficit in brain weight".

So, eight reports, in at least four different animal species, show cortisone damaging developing brains in animals. What about humans?

2. Human studies on cortisol

In researching if cortisone treatment is good or bad for babies in utero, there's a problem that such research is unethical in humans. So we must find situations when pregnant women are given steroid treatment for some medical condition.

a) Cortisol in pregnancy

One possibility is when steroids are prescribed in pregnancy as treatment to prevent premature birth. Spinillo et al. (2004) examined children, aged two, whose mothers had been given corticosteroids for this purpose. They found that prenatal steroid treatment was associated with delayed psychomotor development in the children. Similarly, French et al. (2004) reported that repeated doses of corticosteroids in pregnancy were associated with abnormal behaviour in the children. However, there is also reason to be reassured. Wapner et al. (2007) reported that after weekly courses of betamethasone in 465 children assessed between two and three years old there was no significant difference found in brain measurement nor in the incidence of cerebral palsy. So the evidence differs.

b) Stress in pregnancy

Giving corticosteroids as a treatment is not the only way pregnant women can have steroids circulating in their bodies. Women make their own natural hormones, if they are stressed in pregnancy. Wright et al. (2010) studied mainly black women in an American inner-city neighbourhood, who were stressed socially. They found marked differences in the presence of cytokines in the cord blood of the stressed women. Cytokines are chemicals, protein signalers, similar to hormones.

c) Corticosteroids given to newborn babies

A third way of examining the effects of cortisone on young brains is when newborn babies are given a steroid, like dexamethasone, as treatment, for example, for respiratory distress. Shinwell et al. (2000) in a randomised controlled trial, showed that steroids were not effective in improving this condition. However, they examined the children's neurological progress and found that the steroid-treated children had significantly more developmental delay and cerebral palsy. The odds ratio for harm was relatively high at 4.6. (CI=2.4 to 9.0). This was a randomised controlled trial, so this is strong evidence that steroids harm some children's brains.

d) Stress and cortisol levels in small children

It is well known that separating a small child from its mother causes stress in the child. Day-care centres for small children create mother-child separation. The use of child centres for the under fives has increased by over a third since the early 1990s (Bingham, citing ONS, 2013) to an average of 668 hours per year. This may be the setting where most stress now occurs in young British children.

Belsky and Rovine (1988) were one of the first to suggest that the sexes vary in their response to day care and that boys react less well so that "difficult boys" are particularly vulnerable to psychosocial stress. Later Belsky et al. (2007) showed that parenting was a more important factor predicting children's development than early child-care experience. They also showed that high quality care predicted higher vocabulary scores (a positive development) but also predicted more externalising behaviour (such as aggression (an undesirable development) as reported by teachers.

A longstanding difficulty for researchers has been measuring stress through cortisol levels in children, as taking blood tests for research in children is unethical. A breakthrough occurred when it became possible to measure cortisol non-invasively by simply touching the inside the child's cheek with a swab. This stimulated much research. In most research studies, the children who were used as controls, i.e., used for comparisons, were those at home with their parents, usually their mothers. The normal pattern at home is for the child to have a high level of cortisol measured the morning, which falls during the day.

Megan Gunnar et al. (1997) noted that children with high cortisol levels in the day were often rejected by their peers. Dettling, et al. (1999), in a seminal study, examined 70 children and linked cortisol levels with questionnaires completed by parents and the teachers of the children. They found that children aged 3-4 were significantly more likely to have raised cortisol levels if they were in day-care rather than at home. Dettling et al. (2000) showed that the quality of day-care influences the changes in cortisol levels over the day for young children experiencing such care.

Ahnert and Lamb (2004), working in a German nursery, were able to relate the appearance of children to their cortisol levels. They video-recorded the children. Notably, they found that after five months in day-care children whose carers thought that they "had settled" had cortisol levels considerably raised compared to children at home. Observation of the children's behaviour did not detect this. They state that day-care care is stressful for one year old children and this effect is not entirely countered even by strong parent-child relationships.

Geoffroy et al. (2006) found that in children in day-care, the level of cortisol increased during the day, whereas it usually falls in children at home. They observed that the effect size was greater in children in low-quality child care and that there was little or no effect in high-quality day-care. Children seen as "difficult" had higher cortisol levels. Vermeer et al. (2006) undertook a meta-analysis (a survey of surveys) summarising nine different research reports. Their main finding was: "that in day-care, children have higher cortisol levels when compared with children at home. This effect of day-care attendance was especially notable in children *younger than 36 months*." (my italics).

Megan Gunnar, an international expert, has continued to work with colleagues on children in day-care. Her latest research (2010) has related the rise in cortisol which occurs in full-time day care to both aspects of care quality, child behaviour, and the sex of the child. They found that 63% of 151 children in day-care had a rise in cortisol levels (when compared with children at home) and considered 40% of them were stressed. Raised cortisol levels in girls were associated with behaviour suggesting anxiety and on boys with behaviour suggesting anger and aggression.

All this suggests that home care is good and day care is less good. But in medical and social science research, it is unwise to over-generalise. Chryssanthopolou et al. (2005) took a different approach. They researched the mothers' perceptions of their jobs and asked mothers if they felt exhausted and then related the reports to cortisol levels in their children. For mothers who felt their job was of very low quality or who reported feeling exhausted, their children who spent long hours in child care had lower levels of cortisol than children who spent shorter times in child care. The implication is that for the children of exhausted mothers, day-care may be a sanctuary from some highly stressed homes.

Government policy on child day-centres

The big policy question is: are day-care centres for children desirable from the child's point of view or does the separation of the child cause stress and so release cortisol? We need to think clearly about a complicated and sensitive policy. It is reasonable for governments to encourage people to work for many reasons, not least because work increases the country's Gross Domestic Product (GDP), which means that those who work contribute to the wealth of the country. Also, many mothers want to work, enjoy work, and are very good at it. However, working mothers need some form of child care.

So how does a charity like What About the Children? formulate policy? The first step, already taken, is to make the point that raising the GDP is an impersonal, economic policy and aiding fulfilment of the role of women is important, but is a policy to help *adults*. The central point, is what *is best in the interests of the child*, especially the very small child? The implications of the research described are that the interests of the child lies in securing 'attachment' i.e., fostering its immediate relationships by providing loving, consistent care, especially in the first two years of life. There is a big difference according to the age of the child. Over the age of four, group care can provide important socialising experiences. The key issue is the under threes, where WATCh? has rightly focused. Here successive governments of all political parties have encouraged mothers to go out to work.

Love

Day-care for children is described in official documents and assessed in mechanical and unemotional terms, through the language of buildings, staffing ratios, inspections, and so on. One word is always omitted from public pronouncements and that word is 'love'. It took Sue Gerhardt in (2004) to reintroduce it in the title of her classic book *Why Love Matters: How Affection Shapes a Baby's Brain*.

Somebody, somewhere, needs to say that formal child day-care substitutes care by a parent who loves the child with care by someone who doesn't. By ignoring love, we diminish motherhood, and parenthood, and discount one of their most precious strengths. This implies there should be more research on grandparental care, which is not always available, but is still widely used, and which provides another form of love.

The Sure Start programme

The formal evaluation of the Government's big Sure Start programme of day-care in the early years of childhood was done by Melhuish and Belsky et al. (2008) who reported in *The Lancet* after studying 12,575 children. Using 14 different criteria, in nine, including immunisation rates, they found no significant difference between Sure Start children and controls. On five criteria there were statistically significant differences like: "better social development, more positive social behaviour, greater independence, less negative parenting, and a better home-learning environment." All five differences were in favour of Sure Start. This evaluation by leading behavioural psychologists in the UK was essentially positive. Melhuish *et al.* (2008) is the main academic justification for day-care by Governments of all colours.

However, two points arise. First, the authors stated: "The sponsor [The Department for Children, Schools and Families] *directed the research design* (my italics) precluding a randomised control trial and necessitating a quasi-experimental design" (a much weaker scientific process). It is most unusual for a sponsor, let alone a government department, to dictate research design to academics, and it is most unfortunate that this happened. Secondly, no cortisol levels were examined. Old hierarchies of thinking continued and these expert psychologists ignored, or were directed to ignore, an important biological, physical test.

Neuroscience research in North America

With some conflicting conclusions between different studies, it is helpful to study the latest research in neuroscience in North America. Their studies suggest, that in the first year mother-child communication is primarily non-verbal, through looks, through voices and 'cooing' sounds and through touch. Mothers communicate their love effectively in these three ways, before language ever begins. The baby's prefrontal cortex is activated and in the postnatal period as many as 40,000 synapses (nerve junctions) are formed every second (Schore, 2013). Babies soon learn to recognise their mother's face and this is reciprocal -mothers can identify their own baby's cry in a crowd.

In the longstanding debate between the relative importance of 'nature' and 'nurture', although the role of genes (nature) has been growing in recent years, this research underlines the importance of *nurture*. The latest thinking is that the human genome exists in a dynamic relationship with the environment, responding continuously. Changes can occur in desirable or undesirable directions (Meaney, 2013).

Childhood stress and the brain

Carrion *et al.* (2007) put it simply: "stress predicts brain changes in children." Stress in animals shows that high stress levels are associated with structural change in the pre-frontal cortex. In children, damage to the pre-frontal cortex, measured by MRI scans, is associated with impaired control of emotions. Hanson *et al.* (2012), in a major study, showed that whilst low levels of stress can stimulate and be helpful, high levels cause harm, especially on the so-called "executive functions" which mean control of inhibition, sustained attention, working memory, and cognitive flexibility.

Observant head teachers are reporting that sustained attention in small children is falling (Boddy, 2013). There are 4,000 exclusions of children under five and 400 suspensions of children aged two to

three from nurseries in Britain (Frea, 2008), mostly for aggressive behaviour. Emotional self-regulation is central to how people react to each other and treat each other i.e. to relationships.

The Wisconsin Study of Families and Work Programme in the USA

Burghy *et al.* (2012) studied how the amygdala-prefrontal cortex affected emotional control. They found “profound” differences between boys and girls. Their three main findings are:

- Early life stress correlates significantly with the children’s cortisol level ($r = 0.45$)
- Cortisol levels correlate, highly significantly, with findings on MRI scans of the amygdala-prefrontal cortex ($r = 0.78$)
- Childhood cortisol correlates with anxiety [low connectivity in adolescence] in older girls (but not boys) ie low cortisol means high connectivity: high cortisol means low connectivity in females. In boys, stress activates the release of testosterone which explains so-called “externalising behaviour” and aggression.

Eating patterns and later weight

Geoffroy *et al.* (2012), in Canada, studied 1,649 children. They related hours spent in day-care by small children to them later becoming overweight or obese. With parental care at home classified as the comparator, children were 65% more likely to be overweight/obese if in day care ---with a dose dependent response (which makes the finding more significant). There was a 9% increase in weight for every five hours per week spent in day care. This thinking means that the small child’s early environment plays out years later in adolescence and early adulthood.

Effects in adulthood

Research has approached the question of long-term effects from both ends. Some researchers have tracked forwards from records in childhood following children up for years. Stewart-Brown (1998) and *et al.* (2005) used cohort studies and showed poor attachment in childhood was associated with multiple illnesses, many years later. Other research started with adults with problems and looked backwards to their attachments in childhood (Zulueta, 2006). The two approaches lead to agreement. Long-term effects, both physical and psychological occur, years after poor attachment (Lechman and March, 2011).

Obesity, one of the big health hazards of our time, has been shown to be associated with children being in day-care (Geoffroy *et al.*, 2012). Fagundes *et al.* (including Kiecolt-Glaser, 2012) researched stress in a different way, looking for links with cancer in adults because earlier work had shown that raised levels of cortisol were associated with reductions in immune function. Kiecolt-Glaser’s world leading team had previously shown that stress can affect: vaccine response, wound healing, and can cause inflammation.

They chose basal cell carcinoma, a common skin cancer, which in the US has been doubling in incidence every 14 years, for unknown reasons. They found that experiencing adverse life events reduced immune function and that early life stress in childhood is associated with the development of some cancers in adult life.

I offer another possibility. There is worrying research in medical education showing an unexplained loss of empathy in recent generations of medical students (Bleakley and Marshall, 2013). Could this be a consequence of early child care separation?

Epigenetic changes

Over and above these findings lies a huge possibility—an enormous challenge for our society -- epigenetic change (McGowan *et al.*, 2009). There is evidence that changes in environmental circumstances, such as stress, can lead to alteration in human genes and so get passed on through the generations. Even the basic DNA can be modified, principally by methylation. The National Scientific Council on the Developing Child (2010) in the USA, in its Working Paper 10 from Harvard, concluded that “early experiences can alter gene expression.”

If loss of self-control and reduced empathy were to become much commoner and were to be built into the genes, then degradation of the human species would be occurring. This hugely raises the stakes. If we get policies wrong, there may be an impact not just on children today, but on generations to come.

POLICY DEVELOPMENT

Using cortisol tests

Calling for up-to-date research on every new change proposed is one step What About the Children? can take, including the routine use of cortisol testing. For example, instead of Government calling for fewer staff per number of children in day centres as now, the logic is to examine the cortisol levels in children with different staffing levels and then always to act to lower the children's stress. A major research study is needed on children in day care, quantifying the stress i.e., just how many children are affected and with long term follow up.

Meanwhile, given that in the real world compromises have to be made, with evidence that longer hours of day-care in the week for small children are associated with higher cortisol levels and behavioural problems, then shorter hours in day-care should be encouraged. Similarly, research is clear that high quality care is better for children than low quality care, so governments/regulators should require, via legislation, high standards of care in day-centres.

Taking risks

However, Governments may be taking greater risks and incurring greater costs than is realised. Is so-called "wrap around" care from 7am in the morning (OFSTED, 2005) through to 7pm social progress? How many of us would feel stressed if placed with strangers for 12 hours consecutively? If parents use weekend care as well, are they, in effect, "outsourcing parenting?" And at what price?

We cannot be complacent. Children in the UK are not doing well. We have higher rates of overweight children (30.2%; Department of Health, 2012) more teenage pregnancies (Lawlor and Shaw, 2004) and more children reporting unhappiness (UNICEF, 2007) than in most comparable countries.

Seeking changes in government procedures

Fostering good human relationships is crucial in a civilised society. Nowadays all new government policies have to have an impact assessment on their effect on climate change or check if they are compatible with the policies of the European Union. Can we persuade governments to start evaluating the effect on human relationships in childhood of all new Acts of Parliament and policies? These evaluations need to consider the costs of not nurturing small children, particularly in the health and criminal justice systems. Similarly, the British Government operates a sophisticated national risk assessment system. Leading scientists estimate the risk to our society of various events such as pandemic influenza or being hit by an asteroid.

However, the risk of significant degradation of the emotional state of large numbers of people and consequent risks to both the emotional and physical health of the population (through childhood stress through separation anxiety causing cortisol release and brain damage) has not yet been identified as such a national hazard. The research briefly outlined here suggests this may be a higher risk than, say, asteroid arrival.

Transparency of facts is a great protection. But recently statistics have been published lumping people together as "married or living as married", as if there was no difference between these two groups. This is discriminatory against married people and should be stopped.

Possible partnership - relationships with other charities

Tackling these issues is a big challenge. Small charities like WATCh? can't do it alone. The timing is urgent.

The merging of the Day Care Trust and the Parenting Institute next month, means that the body supporting parenting will then be supporting parent-child separation. Currently, the Government had just announced a proposal to make £1200 available per child for the use of formal day care (The Times, 2013).

One possibility is for charities that focus on human relationships to link and support each other. Could a registered charity, like the Relationships Foundation, which recently fostered the launch of another registered charity, the Marriage Foundation, become a federal, umbrella body? Could it help link several charities like WATCH? which works to foster one specific relationship? Could this raise the profile of human relationships in general, and help share expertise, contacts, and perhaps petitions and lobbying?

Royal Commission on child separation in the early years and its consequences

Many of the big difficult problems of society where there are conflicting views have benefited from detailed study by a Royal Commission. In the nineteenth and twentieth centuries Royal Commissions achieved notable successes, for example, the Royal Commission on Medical Education (1968). By giving a distinguished group of people, chosen for their ability, independence, and a wide range of views, time to analyse research from all perspectives, and time to take evidence, to question, and to reflect on big problems, then deeper insights can be obtained.

This 'wicked' problem of child separation as stress, cortisol release, and brain changes would greatly benefit from a Royal Commission, which would be free to think deeply away from the day to day pressures of government.

SUMMARY

In summary, I have tried to take a broad view. Starting with stress: bodily systems which protect both animals and humans in emergencies, can have harmful effects if sustained stress occurs. In humans, there is research on stress in pregnancy, cortisone use in pregnancy, and cortisone use in small children. These studies do not all agree, but generally the human research fits well with the animal studies.

The overall conclusion is that stress, generates steroid production, which can harm the developing brain. Day-care may now be in Britain the commonest source of stress for small children, through separation anxiety. There is a *prima facie* cause for concern.

The formal Sure Start Evaluation (Melhuish *et al.*, 2008) supported day-care for children in the national Sure Start programme in disadvantaged areas. We should accept its positive findings about socialisation for older children and reducing negative parenting in these areas, but also consider the implication for teaching parenting in schools, especially in disadvantaged areas. We should deplore government intervention in research design and call for cortisol measurements to be made much more systematically in future research.

Neuroscience research from North America

The North American research is more recent than the Sure Start evaluation. Carrion *et al.* (2007) and Hanson *et al.* (2012) link three key points in a triangle: 1. child separation-anxiety as stress, 2. cortisol release as a response to stress, and 3. damage to some developing brains.

Good parent-small child relationships protect the child from stress, especially in the first two years of life. It's the relationships stupid! If there is stress, there is cortisol release, and potential damage to the developing brain, although not all children are affected. It is the child's developing brain we must concentrate on with the key function of the development of empathy.

Epigenetics

The stakes are high. If epigenetics occurs, if stress does change the function of our genes, we may be changing the human race. Such changes may be beneficial, but there is now a *prima facie* case

that greatly increased use of day-care for very small children may, through stress, in some children alter genes for the worse (US National Scientific Council on the Developing Child (2010).

Assessing risk

The occurrence of more children with lack of emotional self-control and empathy and exhibiting aggression is as serious as children becoming more overweight/obese. All this amounts to a strategic threat which should be added to the Strategic Risk Register of the Department of Health. The possibility of epigenetic change for the worse raises the risk considerably. This new hazard needs formal scientific assessment. We cannot yet quantify this risk so perhaps it should also be added to the National Security Risk Register, as it will need a cross government response.

Royal Commission

Concern about childhood relationships is not receiving attention by Governments and policy-makers for economic and political reasons. The need is to find a way of putting the interests of the child first, as the 1989 Children's Act requires. This subject of human relationships in childhood is huge: it has become one of the biggest issues in our society. What About the Children? cannot take on Governments, which are currently committed to encouraging the mothers of small children to go out to work. A subject so big and so important, and with the potential to change the human race, needs a Royal Commission.

Can What About the Children? start campaigning for a Royal Commission on human relationships in the first two years, studying parent-child separation as stress in the early years of childhood and all its possible consequences.

Relationship valuing organisations —new relationships?

Meanwhile, can What About the Children? build partnerships —i.e., relationships and collaborate with other bodies fostering human relationships, perhaps the Relationship Foundation?

Bowlby's theory proved

John Bowlby's attachment theory has been proved. It's a theory of human relationships. A consistent, loving, parental relationship makes networks form in the developing brain, which enable the child to handle stress in later life, achieve emotional self-control, and so relate sensitively to other people. These networks in the brain also influence emotional and physical health, like obesity, in adulthood.

In conclusion: It's the Relationships, Stupid!

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