The Emanuel Miller Memorial Lecture 2006: Adoption as intervention. Meta-analytic evidence for massive catch-up and plasticity in physical, socio-emotional, and cognitive development

Marinus H. van Ijzendoorn and Femmie Juffer
Centre for Child and Family Studies, Leiden University, The Netherlands

Background: Adopted children have been said to be difficult children, scarred by their past experiences in maltreating families or neglecting orphanages, or by genetic or pre- and perinatal problems. Is (domestic or international) adoption an effective intervention in the developmental domains of physical growth, attachment security, cognitive development and school achievement, self-esteem, and behaviour problems? Method: Through a series of meta-analyses on more than 270 studies that include more than 230,000 adopted and non-adopted children and their parents an adoption catch-up model was tested. Results: Although catch-up with current peers was incomplete in some developmental domains (in particular, physical growth and attachment), adopted children largely outperformed their peers left behind. Adoptions before 12 months of age were associated with more complete catch-up than later adoptions for height, attachment, and school achievement. International adoptions did not lead to lower rates of catch-up than domestic adoptions in most developmental domains. Conclusions: It is concluded that adoption is an effective intervention leading to massive catch-up. Domestic and international adoptions can be justified on ethical grounds if no other solutions are available. Humans are adapted to adopt, and adoption demonstrates the plasticity of child development. Keywords: Adoption, meta-analysis, catch-up, developmental plasticity, ethics, growth, attachment, behaviour problems, brain damage, malnutrition, residential care, resilience, self-esteem.

Adoption may be defined as the permanent, legal placement of an abandoned, relinquished or orphaned child within a family of relatives (kinship adoption) or within an unrelated family (non-kinship adoption). Selman (2005) estimated the number of children adopted across the borders of countries (international, mostly non-kinship adoption) to be at least 40,000 in 2003, which is an increase of 100% since the late eighties. The number of adoptions within countries (domestic adoptions) is harder to estimate. In the USA alone, 120,000 children are adopted annually, their total number amounting to about 1.5 million adoptees, just over 2% of American children. One-third of the adoptees are placed within unrelated families; the remainder are adopted by relatives or stepparents (Nickman et al., 2005). In 2003 about 21,000 adoptees came from other countries to the USA, mainly from China, Russia, Guatemala, and South Korea (Selman, 2005). Although the USA is the leading country of destination in absolute terms, it should be noted that this country received only 5.1 international adoptions per 1,000 births in 2003. In the same year, Sweden, Norway, and Spain received twice as many adoptees from abroad per 1,000 births (11.4, 13.5, and 10.4, respectively). Surprisingly low numbers of international adoptees found a new family in Germany (.95 adoptions per 1,000 births) and in the United Kingdom, which brings up the rear with only .46 international adoptions per 1,000 births in 2003 (Selman, 2005). In Germany many more domestic adoptions (4,584 in 2003) took place compared with Norway (206), The Netherlands (29), France (450), or Switzerland (93). In the United Kingdom domestic adoptions amounted to about 6,000 in 2003.

In public opinion the reputation of adoption is somewhat equivocal. The existence of unregulated ‘black baby markets’ (already mentioned by Bowlby, 1951), where children were traded as common commodities according to the law of demand and supply, even without being orphaned or abandoned by their birth parents, has shocked the public and policymakers in countries of origin and destination alike. It led to stricter rules and regulations for adoption, for example in the Hague Convention (Duncan, 1993, 2000; Hague Convention on Protection of Children and Co-operation in respect of Intercountry Adoption, 1993). Also, adopted children have been said to be difficult children, scarred by their past experiences in maltreating families or neglecting orphanages, or by genetic or pre- and perinatal problems (L.C. Miller, 2005a, 2005b; Verhulst, Althaus, & Versluis-den Bieman, 1992). Judith Harris, author of the famous The Nurture Conflict of interest statement: No conflicts declared.

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Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA
Assumption’ (1998) emphasising the role of genetics in determining children’s life course, told her sad story as the parent of an adopted child who went astray whatever parenting efforts she brought to bear. The overrepresentation of adopted children in mental health and special needs services (Juffer & Van IJzendoorn, 2005; B.C. Miller et al., 2000; Schechter, 1960; Van IJzendoorn, Juffer, & Klein Poelhuis, 2005) may have nourished the idea that most adoptions are dissatisfactory to adoptive parents and adopted children, who would suffer from lack of school achievement and self-esteem, and would develop externalising and internalising problem behaviours in childhood and adolescence, and psychiatric disorders in adulthood, even though empirical evidence convincingly showed that the majority of adoptees are well adjusted (Hjern, Lindblad, & Vinnerljung, 2002; Tieman, Van der Ende, & Verhulst, 2005, 2006; Stams, Juffer, Rispen, & Hoksbergen, 2000; Verhulst, Althaus, & Versluis-den Bieman, 1990).

But adoption is also seen as the ‘kindness of strangers’ (Boswell, 1988) to helpless and deprived orphans, abandoned street children or relinquished babies who get a second chance in a warm and protective family (Tizard, 1977). The demand for adoption is not only triggered by infertility (Juffer, 1993, 2002) but also by moving television documentaries about the deplorable circumstances in which orphans in poor countries have to grow up. An example was the broadcast view into the lives of Romanian children in ill-equipped and understaffed orphanages that provoked a steep increase in the demand for adoptees from Romania and other Eastern European countries after the fall of Communism (Carro, 1994).

Although many (domestic and international) adoptees come from deprived backgrounds, and have lost their birth parents or have been abandoned or relinquished by them, their catch-up after adoption has astonished adoptive parents (Champnella, 1994) as well as scientists (Morrison, Ames, & Chisholm, 1995; Rutter et al., 1998). Adoption has been described as a natural experiment or intervention in the lives of the adopted children (D.E. Johnson, 2002; Rutter et al., 2004; Van IJzendoorn & Juffer, 2005), and as a protective factor against the setbacks of the pre-adoption past (Bimmel, Juffer, Van IJzendoorn, & Bakermans-Kranenburg, 2003; Nickman et al., 2005; Stams, Juffer, & Van IJzendoorn, 2002). The change of environment from impersonal group care of low quality to normal family life is more drastic than in any other large-scale intervention such as Head Start or Sure Start.

**A catch-up model of adoption**

Is (domestic or international) adoption a risk factor or a curative intervention in the development of the adopted children? Compared to their past peers left behind in the institution or family of origin, adoption may be a curative intervention and a protective factor, whereas compared to their current, non-adopted peers reared in ‘regular’ families adoption might be considered a risk factor. The question to be addressed here concerns the influences of adoption on the development of the adopted children in the domains of physical growth, attachment, cognitive development and school achievement, self-esteem, and behaviour problems (see also Howe, 1998). We test a catch-up model (see Figure 1) that covers the most important developmental challenges and issues (Sroufe, 1979) for all children.

![Figure 1](image-url) A catch-up model of adoption

For adopted children from deprived backgrounds the first area of catch-up is, of course, physical growth, which is the foundation of any psychological development (Wachs, 2000). Malnutrition and neglect in the first few months or years after birth may lead to impaired growth, as evident from height, weight, and head circumference. A crucial issue is whether adoption is able to reverse this lag in development, and whether catch-up is equally successful in each of the three basic areas of physical growth. Differential plasticity may, for example, be implicated in the growth of head circumference. The first few years after birth may be a sensitive period for brain growth more than for other developmental areas, and malnutrition may cause more permanent damage as it is more difficult to recover from neural damage than from delayed physical (or psychological) growth without structural damage. Growth of head circumference may also be hampered by the strains and stresses of institutional care, and not only by food deprivation. Experience-expectant biological programming of the brain may make it more vulnerable to the combined negative effects of malnutrition and neglect than other aspects of physical and psychological development (see also Rutter et al., 2004).

The second developmental issue is the development of basic trust, in particular for children who were separated from their birth parents through relinquishment, abandonment or death (Bowlby,
When they arrive in their adoptive homes, adopted children are often said to suffer from indiscriminate friendliness (Chisholm, 1998; Chisholm, Carter, Ames, & Morrison, 1995; Tizard & Rees, 1975) and from reactive attachment disorders (Howe, 2003; O’Connor et al., 2000), or disorganised and insecure attachments in general (Marcovitch et al., 1997; Vorria et al., 2003; Zeanah, Smyke, Koga, & Carlson, 2005). Can adopted children and their adoptive parents develop balanced, secure attachment relationships (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005), or do their past experiences with separation and loss inevitably throw a shadow upon each subsequent attachment relationship (D.M. Brodzinsky, 1990b; D.M. Brodzinsky, Schechter, & Henig, 1992; Smith & D.M. Brodzinsky, 2002), even with caring and sensitive ‘alloparents’ (Hrdy, 1999)?

Cognitive development and school achievement are a third area in which adopted children are thought to be at risk. Because of malnutrition and impaired physical growth, brain development may have been delayed during the formative period after birth (Chugani et al., 2001). Furthermore, because of their spending the first few years in impersonal group care environments that lack challenging stimuli (Gunnar, Bruce, & Grotevant, 2000; D.E. Johnson, 2000a, 2000b), cognitive development of adopted children is supposed to be jeopardised or at least substantially delayed. Added to this may be the lack of basic trust, and the concomitant lack of balance between seeking proximity to a protective caregiver and exploration of the environment, leading to less optimal cognitive growth (e.g., Lansford, Ceballo, Abbey, & Stewart, 2001; McGuinness & Pallansch, 2000; Pinderhughes, 1998). Is adoption a successful intervention in the domain of cognitive development, and are adopted children able to catch up with their current, environmental peers, or do they permanently lag behind?

Self-esteem, that is, trust in your own competence, has been suggested to be the corollary of a secure attachment, which is basic trust in a protective other (Ainsworth, 1989). As Bowlby (1973) stated, internal working models of the attachment figure and of the self are complementary. A working model of the self as valued and valuable is constructed in the context of a working model of the attachment figure as emotionally available (Bretherton & Mulholland, 1999), providing young children with a set of expectations that guide their behaviour (Sroufe, 1990). Self-esteem is considered to be one of the most important pillars of healthy personality development (Harter, 1999), and a necessary condition for the realisation of one’s life goals, whatever they are (Rawls, 1980). The emergence of self-esteem in adopted children is not self-evident because they may feel rejected by their birth parents, and out of place in another national, cultural, or ethnic environment (Juffer, 2006; Leon, 2002). They may also suffer from impaired or delayed physical growth, and because of their small stature feel inferior to their peers (Mul, Oostdijk, & Drop, 2002). Adopted children may experience less satisfactory years at school, less often enjoying school success, or they may belong to special streams needing treatment for learning problems, which may not bolster their already somewhat more fragile self-esteem.

The purported lack of basic trust and school achievement of adopted children may not only lead to lack of self-esteem but also to problem behaviours for which special care and treatment are required. Bowlby (1944) described 44 juvenile thieves who had suffered from repeated separations in childhood, and who lacked the empathic feelings that censor anti-social behaviours. Bowlby (1944) diagnosed many of them as ‘affectionless characters’. Understanding emotions has been associated with family experiences, and participation in discussions about feelings and relationships (Dunn & Hughes, 1998) which may happen less often in the institutional setting of group care. Adopted children, with a history of separations or losses early in life and subsequent group care, may have been hampered in the development of empathic concern as a necessary condition for the development of morality (Van IJzendoorn, 1997). In a study examining the longitudinal development of Greek institutionalised children – the Metera study (see below) – we found that after adoption these children were less able to understand other people’s emotions than family-reared children (Vorria et al., in press). Is adoption associated with feelings of inferiority and with mal-adaptation, or is adoption also a protective factor in preventing adopted children from developing low self-esteem and more behaviour problems than their non-adopted peers?

Hundreds of adoption studies on thousands of children have been conducted in the past five decades or so, and we intend to draw upon this evidence base through the method of meta-analytic synthesis. In fact, we report on a series of meta-analyses covering more than 270 studies that include more than 230,000 adopted and non-adopted children and their parents. The answers to our questions are of crucial import to the debate about the social implications and ethical foundations of adoption. Whether or not adoption is a successful intervention, however, it certainly is an ‘experiment-by-nature’ that may uncover the possibilities as well as the limits of human recovery from early adversities, and thus demonstrate the plasticity or [ir]-reversibility of child development, even in domains that are usually considered to be highly genetically determined (Dickens & Flynn, 2001).

But first we outline some historical and ethological backgrounds of adoption to examine whether adoption is unique for humans living in the modern Western world, or goes back to ancient times and is present in various species other than humans.
If adoption is a modern invention unique to the industrialised world and to human beings, adopted children, their birth parents, and their adoptive parents might be less well prepared to embark on the potentially risky venture of adoption. Did history and evolution adapt us to adoption?

Adoption is not a modern invention

In the human species adoption has existed throughout recorded history (Burguier, Klapisch-Zuber, Segalen, & Zonabend, 1996). To name but a few famous examples: Moses, abandoned by his frightened mother, was adopted by the Pharaoh’s daughter. Julius Caesar adopted the later emperor Augustus as his son. The prophet Muhammad, an orphan himself, adopted a son, Zaid b. Haritha, whose wife Zaynab b. Jahsh he later wanted to marry, possibly one of the reasons for putting a ban on adoption in Muslim law (Al-Azhary Sonbol, 1995, p. 52). Gawain, the illegitimate son of King Arthur’s sister Anna, was first stolen and then adopted by a poor fisherman of good birth (Boswell, 1988; Naaktgeboren, 1988). From Hellenistic antiquity through current times, parents abandoned their children when they felt unable to support them, for example due to poverty or disaster or the risk of social disgrace. At the same time, most abandoned children were rescued by the ‘kindness of strangers’ (Boswell, 1988), and reared as adopted members of another family, although some of the examples above suggest that selfish reasons for adoption are also age-old. Seneca called adoption ‘the cure for chance’ as it gave childless parents or parents dissatisfied with their biological children, as well as the abandoned children, new opportunities that nature had not provided yet (Controversiae, see Boswell, 1988, p. 115; Thomas, 1996, p. 230).

Only the rise of foundling homes, starting in the early 13th century, and the growing emphasis on biological relationships changed and limited the role of adoption, and increased the risks of abandonment leading to death (Boswell, 1988; Hrdy, 1999). Foundling homes were breeding grounds for numerous infectious diseases in times when the link between hygiene and epidemic illnesses was unknown. Boswell (1988) documented that the majority of abandoned children in 18th-century foundling homes withered away within a few years of admission, out of sight of the larger society and the abandoning parents. Boswell (1988, p. 48) roughly estimated that in the 18th century 10 to 40% of the children in European cities were abandoned, among them the five children that Rousseau fathered (Rousseau, 1781/1953, p. 322) but thought he was not able to rear because of his career as a writer of treatises on politics and on the art of raising innocent children like Emile in a dangerous world (Rousseau, 1762/1980).

In the 20th century the single most important cause of the increase in abandonment and subsequent adoption was war. Altstein and Simon (1991; see also Selman, 2000; Tizard, 1991) described four major eras in (international) adoption during the last century. The first stage was related to the aftermath of World War II, with a large number of homeless Greek and German children waiting to be adopted. The second era began at the time of the Korean War, which created a large cohort of unwanted children of mixed race, with Asian birth mothers and American birth fathers. More than 100,000 Korean adoptees now live in the USA alone (Lieberthal, 1999). The third wave emerged from the deteriorating socio-economic situation in Latin America, with numerous children abandoned by their poor parents to make a living for themselves as street children. The fourth wave was related to the fall of communism that opened up countries like Romania and Russia for adoptive parents from abroad. We may add a fifth wave, starting in the nineties with stricter birth control policies in China that stimulated the abandonment of female infants, and at the same time the more relaxed attitude of China to the Western world (K.A. Johnson, 2004). Reports about abandoned children growing up in desolate orphanages or on the streets made a strong appeal to many North-American and West-European families who were motivated to adopt a child.

It was during World War II that concerns were raised about the separation, albeit temporarily, of many city children from their families, to be moved to families in less dangerous rural areas. In their correspondence to the British Medical Journal of December 16, 1939, John Bowlby, Emanuel Miller, and Donald Winnicott argued that the evacuation of children between the ages of two and five would cause severe disturbance of their personality development persisting throughout life. The authors even mention preliminary findings from Bowlby’s study on 44 juvenile thieves to show that the ‘emotional black-out’ of evacuation and prolonged separation from the mother figure would later lead to increased deviancy (Bowlby, 1944). This concern still resounds in current ideas about adopted children being more liable to antisocial behaviour (see below; Smith, 2001). It comes as no surprise to learn that Bowlby (1951), in his World Health Organisation report on residential care for orphaned children in Europe after the war, considered institutional care to lack essential ingredients for healthy development. He suggested adoption as one of the better alternatives, although he noticed a deplorable lack of empirical evidence supporting the effectiveness of this intervention in children’s lives (Bowlby, 1951). It is our aim to test Bowlby’s hypothesis on the basis of the hundreds of studies on adoption during the past half-century.

Adoption is not uniquely human

Adoption is not a specifically human type of parenting behaviour, but is shared with many nonhuman
primates (e.g., Champoux, Boyce, & Suomi, 1995; Hrdy, 1999) and other species. Adoption has been found in more than 120 species of mammal, and over 120 species of bird (Avital, Jablonka, & Lachmann, 1998). Like altruism, adoption is the type of human behaviour that seems to elude evolutionary explanations (Avital et al., 1998; Hrdy, 1999; Juffer, 2002). At first sight, adoption seems to incur only costs on the part of the adoptive parents, and only benefits on the part of the adopted child and its birth parents. The birth parents may benefit from the enhanced life expectancies of their offspring in a family that is able to secure survival and even prosperity for the adopted child, and subsequent transfer of their genes to the next generation. Of course, this does not erase the birth parents’ emotional costs involved in the loss of their child, sometimes resulting in long-term consequences such as depression (e.g., A.B. Brodzinsky, 1990a.)

Considering the concept of inclusive fitness (Hamilton, 1964; Trivers, 1972), it is difficult to see how the adoptive parents may profit from the adoptive process. Some ethologists have speculated that at least in some cases of adoption, for example of special needs children, the specific human capacity of exercising free will and making moral choices to the benefit of deprived conspecifics is all the explanation we need (Hrdy, 1999, p. 460). Other evolutionary theorists suggested that adoption is an example of human behaviour that did not evolve in a functional way but should be considered an accidental by-product of evolution (Silk, 1999), not serving an adaptational role at all, like the spandrels’ that were a non-functional by-product of a specific architectural approach to building the San Marco cathedral in Venice (Gould & Lewontin, 1979).

Apart from the moral and the spandrel interpretations of adoption, the following hypotheses have been put forward to explain adoptive behaviours in nonhuman primates and other species. The first set of explanations is concerned with adoption to the benefit of the adopted child only (intraspecific parasitism); Kalmbach, 2006). Reproductive error, that is, the failure to recognise the adopted child as non-kin (Brown, 1998), may be at the root of adoptive behaviours in those species that are not able to differentiate in any accurate sense between kin and non-kin infants (Thierry & Anderson, 1986), in particular during times when hormonal changes make them liable to ‘baby-lust’ (Hrdy, 1999). Fascination with babies is universal in primates, according to Hrdy (1999, p. 161), and this baby-lust triggers mothering also in case of abandoned children or orphans. In addition, Avital et al. (1998) submit that when the parenting style associated with adoption is itself transmitted by social learning to biological offspring and adopted children alike, adoptive behaviour may spread even when such behaviour is selectively neutral or even slightly disadvantageous to the adopting parents.

The second set of interpretations concerns adoption as a process that mutually benefits the adopter as well as the adopted individual (Kalmbach, 2006). As Hrdy (1999) documents, most adoptions by non-human species may involve offspring of genetically related parents (e.g., Kraaijeveld, 2005), and the concept of ‘inclusive fitness’ easily accounts for the advantages of this type of adoption. In case of adoption of unrelated children, the concept of ‘reciprocal altruism’ is useful in showing that adoptive parents may invest in their adopted children with the ‘expectation’ of getting in return some support, for example in learning how to mother adequately their own offspring, or in helping their own offspring to survive (predator detection or distraction), or in providing their biological children with socially similar but genetically unrelated mates when they become adults (the ‘match-making’ hypothesis; Avital et al., 1998). Applied to humans, a primary reason to adopt a girl in China in the past was to obtain a ‘tongyangxi’, a future daughter-in-law and wife for an infant son. Sometimes even childless couples would adopt a ‘tongyangxi’ in the belief that the adoption would enhance the adoptive mother’s chance of giving birth to a boy (K.A. Johnson, 2004).

Evolutionary interpretations assume the benefits of adoption for the adopted children. Their survival and development would profit from the transfer to a stimulating and protective family. Some ethologists even suggest that offspring may actively seek adoptive parents who are in a better position than the birth parents to enhance their life chances (Dolhinow & DeMay, 1982). In human adoptions, children in orphanages certainly are able to influence the choices that prospective adoptive parents make while visiting the residential setting, for example by acting in a more vigorous and friendly manner toward the visitors (Storsbergen, 1995), although nowadays such decision making is usually not preferred, following Hague Convention (1993) agreements.

Nevertheless, it is not self-evident that adopted children prosper through adoption, in particular when adoption also means transition to another country, culture, and ethnic environment.

Evidence for a catch-model of adoption

In the next paragraphs we present the findings of various meta-analyses on the physical and psychological development of adopted children as compared to their peers or siblings left behind (‘past peers’), as well as to their current, or environmental, peers. Does adoption indeed stimulate their development, even when the adoption crosses borders, or takes place after infancy? Is catch-up in growth and development possible, to what extent and in which developmental areas?
In the current paper we report effect sizes in terms of Cohen's $d$: the standardised difference in means between the adopted group and their comparisons. According to Cohen’s (1988) criteria, $d$'s up to .20 are considered small effects, $d$'s of about .50 moderate effects, and $d$'s of about .80 and higher can be seen as large effects. In the meta-analyses reported here, a positive $d$ means an advantageous development of the adoptees compared with siblings or peers who remained behind in the institution or family of origin. A negative $d$ indicates a delay of the adoptees compared with their current, environmental peers or normative comparison groups, a difference between adoptees and comparisons in favour of the latter.

**Astonishing catch-up of physical growth in adopted children**

Children who spend the first few years of their life in institutional care often show retarded physical growth. Central parameters of physical growth such as height, weight, and head circumference lag behind those of their same-aged peers who were more fortunate and grew up in a family. Adoption is an intervention that may have positive effects on these basic developmental parameters. In a recent study of children of the Metera Babies Center in Athens, Greece, we found a remarkable catch-up of height and weight after adoption (Vorria et al., 2003, in press). Metera houses 100 infants from birth until placement with adoptive, foster, or biological parents. A special unit exists for newborns, who are then moved to pavilions with children of five months to five years of age. Most infants are at high risk for neglect or abuse, and have been abandoned or relinquished by their parents who are unable or unwilling to provide for them. The daily schedule for the Metera infants is rather boring: they spend on average 17.5 hours in bed, and play for 3.5 hours, the remaining time being spent on feeding and being changed or bathed.

The Metera study is – together with Tizard’s (1977) pioneering study – one of the exceptional comparative studies to observe infants in an institution lon-
gitudinally, and to examine their subsequent development at age four, about two years after being adopted. Sixty-one adopted children aged four years who had spent their first two years of life in Metera were compared to 39 children, matched for age and gender, but reared in their own two-parent families. At that time, the mean weight of the adopted children was 17.9 kg and for the comparison children it was 18.4 kg. The mean height of the adopted children was 106 cm and for the comparison children it was 105.1 cm. These differences were statistically not significant, and amounted to an effect size of $d = -0.20$. At one year of age, however, the weight of the Metera infants differed drastically from that of the comparisons, with an effect size of $d = -1.19$, meaning that the Metera infants were substantially delayed in growth before adoption. Through adoption the Metera infants had recovered dramatically from their physical growth delays, in spite of their bad start. It should be noted that at birth the Metera infants already weighed less than the comparison infants, $d = -0.71$, but this difference increased during a year in residential care. Catch-up appeared, however, to be almost complete after two years of family life.

In the past few decades physical growth catch-up has been studied in at least 27 investigations, including more than 3,000 adoptees. Is the Metera finding of almost complete catch-up in physical growth the rule across all these growth studies, or is it the exception? In a series of meta-analyses we addressed this issue (for details, see Van IJzendoorn, Bakermans-Kranenburg, & Juffer, in prep.). First, institutional care appeared to have a dramatic negative effect on growth which is most adequately mirrored in the development of height. We found an effect size of $d = -1.71$ for the association between height and duration of stay in the orphanage: longer stay in the orphanage leads to increasingly larger growth delays.

Second, comparison of growth parameters across studies showed converging evidence of massive catch-up after adoption (for details see Van IJzendoorn et al., in prep.). Taking age-corrected height as the index for physical growth, adopted children lagged behind their non-adopted peers at arrival, $d = -2.43$. The growth retardation is extremely large and independent of the age at arrival: it does not make a difference whether the adoptees arrive in their first or in their second year, or later. After several years of growing up in the nurturing environment of the adoptive family, the catch-up is massive: the adopted children still lag significantly behind their current peers but the gap in development is closing: $d = -0.57$. Assuming that the level of delay in age-corrected growth of their non-adopted institutionalised past peers would remain the same as at the time of adoption ($d = -2.43$), the recovery amounts to nearly two standard deviations of age-corrected growth ($d$ at arrival minus $d$ after several years of adoption). The catch-up is complete for the early adoptees (adopted before their first birthday). In late adolescence and early adulthood, however, adoptees are significantly shorter in stature than non-adopted reference groups, maybe because of the early onset of puberty of adopted children experiencing a drastic change of nutritional environment (see Proos, Hofvander, Wennqvist, & Tuuemo, 1992a, 1992b), or because the early stresses of institutional deprivation ultimately leave their permanent mark on the children’s physical development (Rutter et al., 2004; Van IJzendoorn et al., in prep.). For weight, we found a similar pattern of deprivation, recovery and catch-up. Early delays in head circumference, however, appear to be somewhat more difficult to compensate through a nurturing environment after
adoption, and early malnutrition and neglect may cause microcephaly and permanent brain damage in some adopted children (Van IJzendoorn et al., in prep.). We were not able to test whether international adoptions differed in catch-up growth from domestic adoptions, because only one study included domestic adoptees. In this study the domestic adoptees differed only minimally from their non-adopted peers (O’Connor et al., 2003).

**Catch-up in attachment?**

In the Metera study (Vorria et al., 2003, in press) we observed the Metera infants and their family-reared comparisons in the Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978) at 12 months of age, and about two years after adoption the adopted children and their comparisons were seen at home to assess attachment security using the Attachment Q-Sort (AQS; Vaughan & Waters, 1990). The Metera study is the first to assess attachment security longitudinally both before adoption, with the caregivers in the institution, and after adoption, with the adoptive parents, and to compare these children with family-reared peers. As expected, at 12 months the Metera infants showed significantly more insecure attachments to their caregivers in the institution than their comparisons, in particular disorganised attachments. The difference, however, was not very large, and amounted to an effect size of $d = -0.43$, much smaller than the effect sizes found for the growth parameters (see above).

At age 50 months the former Metera children again showed less attachment security (now to their adoptive mothers) than their comparisons, although they had already been adopted for more than two years. The difference in attachment security amounted to an effect size of $d = -0.61$, which is even somewhat larger than at 12 months. It should be noted that SSP and AQS are not fully comparable because the AQS does not measure disorganisation of attachment which seems especially relevant for children in orphanages (Zeanah et al., 2005) and, to a lesser extent, for adopted children (Juffer et al., 2005). Furthermore, for the Metera children their attachment figure changed, so that continuity of attachment is dependent on the internalisation and generalisation of attachment expectations in early childhood. During the first few years of life, attachment is much more a dyadic than an individual characteristic, although one might expect that earlier dyadic experiences leave their traces on later attachment relationships with other people, such as the adoptive parents (Bowlby, 1969; Sroufe et al., 2005). It should also be noted that both family-reared and adopted children scored rather high on the AQS, above the average score for attachment security in normal samples as established in a meta-analysis (Van IJzendoorn et al., 2004). In an absolute sense, most adopted children scored in the secure range. Nevertheless, the catch-up in attachment security of the adopted Metera children was much less impressive than their physical growth catch-up; it was in fact absent. The question is whether this lack of catch-up in the attachment domain is found in other studies on attachment in adopted children as well, or whether the Metera sample constitutes an exception to the rule.

In 10 studies attachment security of more than 400 adopted children was assessed using the SSP (Van den Dries et al., in prep). We found that 47% of the adopted children were securely attached (B), and 53% were insecurely attached. In normal, non-adopted samples 67% of the children are securely attached (Van IJzendoorn et al., 1992). Adopted children are less secure than normative groups of non-adopted children. Seven Strange Situation studies on attachment security including disorganisation in internationally adopted children have been conducted, and one study on domestically adopted children (O’Connor et al., 2000b). In those studies the various classification systems for infants and older children were applied, but the outcomes could be condensed into the well-known four-way classifications, with 45% securely attached children (B), 13% insecure-avoidantly attached adoptees (A), 10% insecure-ambivalent children (C), and 33% disorganised adoptees (D). The attachment classification distribution in normal, non-adopted samples (Van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999) is 62% B, 15% A, 9% C, and 15% D. It is clear that adopted children are less secure and more often disorganised than their non-adopted peers. The effect size for the comparison of secure versus insecure attachments is $d = -0.76$, and for the comparison of disorganised versus non-disorganised attachments $d = -1.16$. Thus, with respect to attachment security, the adopted children and their adoptive parents do not manage to catch up with non-adopted parent–child dyads, although the attachment assessments on average took place more than 20 months after arrival in the adoptive family.

But how is the quality of adopted children’s attachment behaviour compared to their own baseline, that is, to children who are still in institutional care, waiting to be adopted? At this point two published studies on pre-adoption attachments of children in orphanages exist, the Metera study (see before; Vorria et al., 2003) and the Romanian study of Zeanah et al. (2005). The attachment distributions of these pre-adoption samples are remarkably similar, and the combined ABCD distribution is 23% B, 3% A, 4% C, and 70% D (total $N = 162$). Although limited by the small number of pre-adoption samples (2 studies), the catch-up of adopted children now becomes evident: they show much fewer disorganised attachments than the children in the orphanages, and twice the percentage of secure classifications compared with the institutionalised
More than 30 years ago, Dennis (1973) conducted a pioneering study to answer the question: does the cognitive development of adopted children profit from their adoption into well-functioning families, compared to their non-adopted peers who were left behind in the orphanage? He studied children who were abandoned immediately after birth, and who were reared in the Crèche, an orphanage in Lebanon founded by French nuns. The Crèche was a traditional institutional setting with minimal individual care and interaction. The babies were put on potties in long rows in order to empty their bowels, and they slept in cribs in long rows in a large room. Child care in the Crèche satisfied hygienic requirements but it was impersonal. Dennis found 136 former children of the Crèche, a large number of whom (85) were adopted by families around their third birthday. Around their eleventh birthday all 136 former Crèche children completed an IQ test. The results were remarkable. The average IQ of the adopted children was within the range of normally developing children, whereas the non-adopted orphans were diagnosed as mentally retarded (Van IJzendoorn & Juffer, 2005).

Is the cognitive development of adopted children in general more advanced compared to that of children who remained in institutional care or in the birth family? And do adopted children even manage to catch up with their current, environmental, non-adopted siblings or peers? Across 6 studies, including 253 participants, the adopted children outperformed their siblings or peers left behind in terms of their performance on an IQ test (with a large effect size, \( d = 1.17 \)) (see Figure 2). In terms of school achievement, the adopted children also outperformed their left-behind siblings and peers (with a substantial effect size, \( d = .55 \), in 3 studies including 523 participants). Adopted children are able to profit substantially from the positive change of environment offered by adoption and their subsequent upbringing in educationally more stimulating adoptive families (Van IJzendoorn & Juffer, 2005; Van IJzendoorn, Juffer, & Klein Poelhuis, 2005).

Furthermore, we found that across 42 studies with more than 6,000 children a negligible difference in the IQ of adopted children and their non-adopted, current, environmental siblings or peers existed (a non-significant \( d = -.13 \)) (see Figure 2). Comparing their school achievement, we documented that the adopted children did somewhat less well in school, but the effect size was rather small \( (d = -.19, \text{ in 52 studies with more than 78,000 participants}) \). Their language abilities also showed some delay compared with their environmental siblings or peers, but again the effect size was small \( (d = -.09, \text{ significant across 14 studies with more than 15,000 participants}) \). Domestic and international adoptions were equally effective in stimulating cognitive catch-up.

The largest effect was found in a set of eight studies (with more than 13,000 children) comparing the learning problems of adopted children with their environmental peers \( (d = -.55) \). The percentage of adopted children struggling with learning problems is significantly larger than that of non-adopted children. We found a twofold increase in special education referrals in adopted children (12.8%) compared to non-adopted comparisons (5.5%) (see below for interpretations of this finding).

For IQ catch-up, age at adoption did not seem to make a difference, although for school achievement catch-up was less complete in later adoptions (after 12 months of age). Thus, early adoption may be a protective factor, not so much for cognitive competence (IQ) as for cognitive performance. The discrepancy between adopted children’s positive attainment in terms of IQ and their somewhat delayed school achievement (in children adopted after their first birthday) may indicate an ‘adoption decalage’, that is, a gap between adopted children’s competence and their actual school performance (Van IJzendoorn et al., 2005). Taken together, the positive impact of the adoption experience on the adopted children’s cognitive development is evident.

**Figure 2** Catch-up after adoption: effect sizes for catch-up compared to past peers and current peers (effect sizes \( d \))
Self-esteem of adopted children

Self-esteem refers to the value or sense of worth one perceives about one’s self, whether and to what degree the self is valued and worthwhile. Cicchetti and Rogosch (1994) reviewed the extensive literature documenting that maltreated children show low self-esteem, and that they are more likely to be rated by teachers and mothers as lower in self-esteem than nonmaltreated children (Egeland, Sroufe, & Erickson, 1983; Kim & Cicchetti, 2004; Toth et al., 1997). In healthy development a sense of self as worthwhile is suggested to result from sensitive parenting providing children with a secure base and basic trust in oneself as well as in a protective other when needed (Sroufe et al., 2005). Adopted children may have experienced impersonal group care and even maltreating care before adoption, and the question is whether adoptive parents manage to stimulate the feelings of a unique and valued self in their adopted children.

Also, the smaller height of adopted children may lead to lower self-esteem (Oostdijk et al., 1996). Oostdijk et al. (1996) found that almost half of the adopted children evaluated themselves as too small; in an earlier study on more than 1,200 adopted adolescents almost two-thirds of the adoptees found themselves too small, and those who thought of themselves as too small showed more problem behaviours according to their parents as well as to themselves, and to have lower self-esteem. In our longitudinal study on early-adopted children followed from their first year after birth (Juffer, 1993) into adolescence, we assessed self-esteem at 7 years in 149 adopted children. Self-esteem was measured by the teachers through the California Child Q-set (Block & Block, 1980; Van Lieshout et al., 1986). To our surprise, we did not find any difference in self-esteem between the adopted boys and their non-adopted peers, and the adopted girls even scored somewhat better than their non-adopted peers, with a non-significant $d = .22$ in favour of the adopted girls (Stams, Juffer, Rispens, & Hoksbergen, 2000). In our study self-esteem was not associated with satisfaction about body height (Juffer & Van IJzendoorn, 2006).

Is our finding representative for the many studies on adoption looking for differences in self-esteem between adopted and non-adopted children? In a set of meta-analyses on more than 80 studies including over 40,000 children (Juffer & Van IJzendoorn, in prep.), we investigated whether adopted children indeed struggle with their self-esteem to a higher degree than their non-adopted peers do. We found a non-significant combined effect size of $d = .02$. Domestically adopted children did not differ from internationally adopted children, and early adoptees did not differ from later adoptees. Contrary to common sense, adopted children do not seem to struggle with self-esteem more than their non-adopted peers (see Figure 2).

How well-adjusted are adopted children?

Although adoption usually offers improved medical, physical, educational and psychological opportunities for adopted children (Palacios & Sanchez, 1996; Van IJzendoorn & Juffer, 2005), several studies found that adopted children show more internalising and externalising behaviour problems (e.g., Juffer, 2006; Juffer, Stams, & Van IJzendoorn, 2004; Verhulst et al., 1990; Verhulst & Versluis-den Biem, 1995; Versluis-den Biem & Verhulst, 1995) and are overrepresented in mental health populations (e.g., Humphrey & Unsted, 1963; Piersma, 1987; Schechter, 1960). Some studies found more mental health problems in international adoptees, in particular in children placed beyond infancy (Cermak & Daunhauer, 1997; Fisher, Ames, Chisholm, & Savoie, 1997). In a cohort study in Sweden involving more than 11,000 international adoptees a significantly higher risk of suicide, psychiatric illness and social maladjustment was found (Hjern et al., 2002). It has also been suggested that the smaller height of adopted children would lead to more externalising problems (Oostdijk et al., 1996). In our longitudinal adoption study involving internationally adopted children followed from their first year into adolescence, we found that dissatisfaction with height at 14 years of age was related to more concurrent total problems and more internalising problems on the Youth Self Report version (Achenbach, 1991a) of the Child Behavior CheckList (CBCL; Achenbach, 1991b). Mother- and teacher-reported CBCL scores for problem behaviours at age 14, however, did not significantly differ between adopted children who were satisfied with their height ($n = 118$) and those who were dissatisfied with their short height ($n = 35$) (Juffer & Van IJzendoorn, 2006). Do adopted children indeed show more behaviour and mental health problems than non-adopted comparisons, and is their catch-up in this area less complete than in other developmental areas?

In a series of meta-analyses (Juffer & Van IJzendoorn, 2005) 101 studies on total behaviour problems were covered, including more than 25,000 adoptees and more than 80,000 non-adopted comparisons, 64 studies on externalising problems, and 64 studies on internalising problems, as well as 36 studies on mental health referrals, including more than 5,000 adopted children and more than 75,000 comparisons. We found only small differences between adopted and non-adopted children across this large set of studies. Compared to non-adopted controls, adoptees showed more total behaviour problems ($d = -.18$) (see Figure 2), more externalising behaviour problems ($d = -.24$), and more internalising behaviour problems ($d = -.16$) but effect sizes are small. The only substantial difference was that adoptees were overrepresented in mental health.
referrals ($d = -.72$) compared to their non-adopted peers, a finding that resembles the larger percentage of adopted children with learning problems requiring special treatment (see above).

Are international adoptees at higher risk for behaviour problems and mental health referrals than domestic adoptees? International adoptees are often more deprived before adoption compared with intra-country adoptees, so they may be at a disadvantage. Nevertheless, international adoptees showed significantly fewer total behaviour problems compared with domestic adoptees, and fewer externalising and internalising problems (Juffer & Van IJzendoorn, 2005). Moreover, international adoptees were significantly less often referred to mental health services compared with domestic adoptees. We found no differences between early and late international adoptions (adoptive placement before or after 12 months). It should be noted, however, that the meta-analyses did not cover some potentially important but rarely studied deprivation-specific syndromes such as quasi-autism. In the studies on the Romanian adoptees who suffered profound deprivation, more psychopathology including these types of syndrome was found than in domestic adoptees (O'Connor et al., 2000a; Rutter et al., 1998). Similarly, we found in our meta-analyses that internationally adopted children who had experienced serious adversities before adoption (severe neglect, abuse, or malnutrition) showed more total and externalising behaviour problems than international adoptees without these adversities (Juffer & Van IJzendoorn, 2005).

In sum, effect sizes for the differences in problem behaviours between adopted and non-adopted children are remarkably small: the majority of (international) adoptees are well adjusted, although more adoptees are referred to mental health services compared to non-adopted controls. Contrary to common opinion, international adoptees present fewer behaviour problems than domestic adoptees, and they have lower rates of mental health referrals.

**Adoption as successful intervention?**

The effectiveness of adoption as a social intervention is clear from the comparisons with the children left behind in the orphanages, comparisons that were possible for growth, attachment, and cognition. The catch-up is remarkable, in particular in the area of physical growth. But adopted children also show much more attachment security and much less attachment disorganisation compared with children in residential care, and their IQ scores are also much higher than those of their peers left behind.

Nevertheless, adopted children still lag behind their current, environmental peers, and their catch-up remains incomplete in some domains. They still show slightly smaller height, weight, and head circumference than their non-adopted current peers, and adopted children also display more attachment insecurity and disorganisation than their current peers. The catch-up for IQ is almost complete. Finally, adopted children do not differ substantially from non-adopted peers in self-esteem or in (total) behaviour problems.

Thus, incomplete catch-up in the domains of physical growth and attachment is not associated with lack of self-esteem and more behaviour problems. Nevertheless, across studies we found a considerable effect size for referrals of adopted children to mental health services ($d = -.72$) or special education services ($d = -.55$). We speculate that a sizeable minority of adopted children remain vulnerable for developmental problems that need specialised treatment because of their pre-adoption experiences, and persistent brain damage as indexed by delayed growth of head circumference may be one of the causes (Fries et al., 2005; L.C. Miller, 2005b; Rutter et al., 2004; Van IJzendoorn et al., in prep.). However, two alternative explanations for the higher referral rates of adopted children should be mentioned. First, adoptive parents may have a lower threshold for seeking support and advice (Warren, 1992), and second, as we suggested elsewhere (Juffer & Van IJzendoorn, 2005), the higher referral rates may in fact have prevented more serious (behaviour or cognitive) problems in the adopted children. The relatively modest effect sizes found in our meta-analyses of adopted children’s functioning could be considered as evidence for the latter explanation. Pre-adoption experiences appear to leave their traces in adopted children’s physical growth but also in their attachment relationship with the adoptive parents, and a longer pre-adoption period or later age of adoption is indeed related to more attachment insecurity as well as less catch-up in physical growth. Longer pre-adoption periods do not seem to lead to less IQ catch-up, or to more behaviour problems, lower self-esteem, or more mental health referrals.

In short, adoption is a successful intervention that leads to remarkable catch-up in all domains of child development studied here. Adoption documents the astonishing plasticity of human development in the face of serious adversity and subsequent drastic change in child-rearing circumstances.

**The ethics of the adoption triangle: is adoption a Band-Aid or a justifiable intervention?**

Although the benefits of adoption for the adopted children are clear-cut, as we documented above, it is less clear what ‘emotional costs’ are involved for the birth parents. Howe and Feast (2001) showed that for both adopted children and birth parents the significance of their biological relationships may remain great, even after the adoptee reaches adulthood.
Adoption has sometimes fallen into disrepute as the ultimate form of human exploitation by the rich and powerful taking the only valuable commodity away from the poor and powerless, namely their children. ‘Black adoption markets’ have existed (and may still continue to exist in some places), and they have caused appropriate concern in the media and in public opinion. Children cannot be equalled to an economic commodity for which the price is determined by (scarce) supply and (high) demand (Palmer, 1986; Medoff, 1993). Adoption is first and foremost an ethical issue, and the crucial question is how to serve the interests of the child and the birth parents in a world in which too many parents are not able, not willing, or thwarted in their attempts to take care of their children.

The need for an ethical justification of adoption depends on the type of adoption. If we broadly divide adoptions into two categories, adoption of orphans and adoption of abandoned or relinquished children, it goes without ethical reasoning that adoption of orphans is always justified when it provides adoptees with a home and a secure family life, the kind of life that they lost through the death of their parents. It is also clear that adoption by relatives (kinship adoption), in most cases resulting in domestic adoptions, should prevail over (international) adoptions by non-kin, if the former are indeed available. Humans are evolutionary biased to take care of genetically related children (inclusive fitness; Hamilton, 1964; Hrdy, 1999). If non-kinship adoption is the only way to a secure family life, adoption seems justified because it guarantees basic conditions for healthy development to which all children are entitled (United Nations Convention of 1989 on the Rights of the Child). In the near future, the HIV/AIDS pandemic will exponentially increase the number of orphans in the African continent, possibly making adoption, in most cases, the only way to a secure family life that they lost through the death of their parents.

One of the most important bases of self-esteem and of the ability to fulfil one’s life goals – whatever they are – is the experience of a secure family life and the unconditional love of parents (Rawls, 1980, pp. 463–464). Applying the cautious decision rule of maximising the minimum return would mean that the rights and life chances of the weakest party should especially be taken into account. No rational decision maker would like to end up in the position of a maltreated or neglected child whose parents had to relinquish or abandon him or her, without the opportunity of adoption. Even the potential birth parent would agree that the most vulnerable position is that of the abandoned child, and that he or she should prioritise this child’s right to a secure, permanent family life in order to prevent the child finding himself or herself in the minimal and hopeless position of the abandoned child.

Of course, in the original position, no doubts as to the genuine inability of the birth parents to care for the child should exist (including personal or cultural impediments), and adoption should not be a choice at all in the case of a ‘good-enough’ parent who might only manage to provide the child with less than optimal but still minimally satisfactory childrearing conditions. In that case the fundamental rights of the birth parents might be jeopardised even if a child might be better off in another family. Also, the supply and demand rules of the adoption ‘market’ should not play any role in triggering poor parents to leave their children with more privileged peers. No participant in the original position would like to find himself or herself in the position of the birth parent deprived of the opportunity to rear his or her own children. In order to maximise the minimum prospects of the birth parents, structural measures to

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improve the life conditions of poor families in developing countries are clearly needed in order to prevent the necessity of adoption as much as possible.

In fact, the Hague Convention on Protection of Children and Co-operation in respect of Intercountry Adoption (1993) elaborates on principles and procedures for adoption that seem to emerge from Rawls’ original position applied to the adoption triangle. The Hague Convention states that the child, for the full and harmonious development of his or her personality, should grow up in a family environment, in an atmosphere of happiness, love and understanding. Each country should take, as a matter of priority, appropriate measures to enable children to remain in the care of their family of origin. International adoption may, however, offer the advantage of a permanent family to a child for whom a suitable family cannot be found in his or her country of origin. But international adoptions should be made in the best interests of the child and with respect for his or her fundamental rights, and to prevent the abduction, sale of, or traffic in children. The Hague Convention agrees on a set of procedures and institutions in countries of origin and destination that should guarantee the application of these principles (Duncan, 2000).

The Hague Convention certainly protects the fundamental rights of the child and of the adoptive parents adequately, and its assumptions as to the importance of a permanent family life for the child are valid. Nevertheless, we would like to make three comments that address the position of the birth parents. First, although the Hague Convention mentions the role of birth fathers a few times, it fails to mention the birth father where it states that ‘consent of the mother … has been given only after the birth of the child’, of course without the pressure of rewards or punishments. It remains unclear why the right to give consent to the adoption procedure is restricted to birth mothers, and does not extend to birth fathers – if their identity is known and they are able to give an informed consent. Anyone in Rawls’ ‘original position’, regardless of gender, would be troubled by imagining himself or herself in the role of the birth father and not being able to play a substantial part in the adoption consent procedures.

Second, the ‘best interest’ of a child might be to leave his or her just ‘good-enough’ parents and to be adopted into a superbly sensitive and secure family. In some species this is exactly what triggers the adoption process, with an active role of the offspring seeking a better environment (see above). As we pointed out in discussing the original position, however, such a choice would be unacceptable for the rational decision maker who would want to protect not only the child’s and the adoptive parents’ rights but also the rights of the birth parents to rear their own children. ‘Good-enough interest’ provided by ‘good-enough’ parents should replace the phrase ‘best interest’ in the Hague Convention to protect the birth parents’ rights. Maximising the minimum outcome for the weakest party involved would mean that every child’s claim to basic trust, self-esteem and healthy psychological adjustment is warranted, not that optimal adjustment and maximal self-esteem should be guaranteed.

Third, in the original position rational decision makers would not be satisfied with the potential role of a birth parent forced by poverty or ideology to abandon or relinquish a child. In general, the social contract agreed upon would be one in which the minimal conditions for survival and for the realisation of personal goals, including rearing children, were fulfilled. Some have argued that current adoption practices would counteract or hinder efforts to provide more structural economic support to the countries of origin, which may protect many more children than is possible through the Band-Aid of adoption. As Bartholet (2005) showed, this line of reasoning is defective in various respects (see also L.C. Miller, 2005b). Nevertheless, efforts to prevent abandonment and relinquishment should get highest priority. Paradoxically, adoption as a successful intervention should be prevented by measures that decrease the need for abandonment and relinquishment and thus for adoption itself. The Hague Convention does not suggest such measures, but related to the adoption process we propose that for every adopted child at least the lifetime costs of raising a child left behind in the country of origin should be financed, through either taxes or donations from the country of destination (as is already good practice in some adoption organisations, see for example Hut, 2005). Such transfers of money to support poor families in general, or to support domestic adoption or foster care in the countries of origin, should be a structural corollary of international adoption.

One final comment concerns the consequences of the Hague Convention for adoption practice today and for the adopted child’s rights in particular. Compared to the past, many prospective adopted children have to wait much longer before they can be adopted, because the country of origin has to ensure that kinship or domestic adoption is not a serious option for a particular child. Meanwhile, prospective adopted children live in adverse circumstances in children’s homes with negative consequences for their development (see our meta-analytic results), and children tend to arrive in the adoptive family at an older age, and often more damaged. Although we agree that it is justified to search for viable alternatives in the country of origin, the child’s waiting time before adoptive placement should be reduced as much as possible.

In sum, adoption can ethically be justified if structural efforts to enable poor birth parents to rear their own children are inherent to the adoption process, and if adoption is successful in creating the conditions for basic trust, self-esteem, and healthy psychological adjustment – which we amply
documented through a series of meta-analyses on adoption catch-up.

Conclusions

Adopted children have been said to be difficult children, scarred by their past experiences in maltreating families or neglecting orphanages, or by genetic or pre- and perinatal problems. We found a linear relation between time spent in an institutional setting and lag in physical growth, indicating that children from orphanages indeed have been negatively affected in a dose–response manner by the pre-adoption period.

But we also found that domestic as well as international adoptions are effective interventions in the developmental domains of physical growth, attachment security, cognitive development and school achievement, self-esteem, and behaviour problems. The meta-analytic evidence for this finding is enormous, based on hundreds of adoption studies on thousands of children and their families. Although catch-up with current peers is incomplete in some developmental domains (in particular, physical growth and attachment), adopted children largely outperformed their peers left behind. In most developmental domains later adoptions (after 12 months of age) or international adoptions did not lead to lower rates of catch-up. Catch-up of late adoptees is less complete in the domains of growth, attachment security and disorganisation, and school achievement.

We suggest that late adoptions (after 12 months of age) lead to more attachment insecurity because around the first birthday the most important developmental issue is basic trust in a protective adult (Bowlby, 1969; Sroufe et al., 2005). Late-adopted children did not have the chance to experience anything like basic trust and a secure relationship, and they may carry these early negative experiences into the formation of new attachment relationships with the adoptive parents. According to attachment theory (Cassidy & Shaver, 1999), attachment starts as a dyadic characteristic that gradually develops into an individual working model of attachment. Our findings of incomplete catch-up in late adoptees suggest that shortly after the first birthday a new attachment relationship with the adoptive parent cannot be inscribed on a clean slate. The previous attachment experiences in the orphanage or with a maltreating birth parent continue to affect the new attachments, confirming Sroufe’s organisational model of attachment (Sroufe et al., 2005).

In light of the incomplete attachment security catch-up it is of crucial importance to support adoptive parents in facing the challenge of developing an attachment bond with the adopted child who in the first instance may be overly friendly to anyone or rejecting of the contact the adopted parents eagerly try to establish. So-called attachment-holding and regression therapies have been used to help these parents and children, but they have never proved to be successful, and they may even be dangerous (Chaffin et al., 2006; O’Connor & Zeanah, 2003; Steele, 2003). In contrast, relatively brief but behaviourally focused attachment-based interventions have been documented to be effective in preparing (adoptive) parents for their complex task, and in supporting their efforts to create a trusting relationship with the (adopted) child (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003; Juffer et al., 2005; Juffer, Bakermans-Kranenburg, Van IJzendoorn, in press; Stein, et al., 2006; see also Scott, 2005, and Scott et al., 2001, for a related approach for families with antisocial children). Moreover, non-kinship adoption calls for more research and ethical reflection on the need for, and consequences of, contact between the birth family, the adopted child and the adoptive parents (Grotevant & McRoy, 1998; Neil, 2003; Neil, Beek, & Schofield, 2003; Wrobel-Miller, Ayers-Lopez, Grotevant, & McRoy, 1996).

We conclude that adoption is an impressive intervention leading to astonishing catch-up. History and ethology suggest that humans, like many non-human species, are adapted to adopt. Adoption demonstrates the plasticity of child development and the remarkable recovery from extremely adverse circumstances in the early years. Adoption research thus appears to refute the concept of early-childhood determinism. Because (international) adoption is effective in turning the tide for children in unfortunate circumstances it can be justified on ethical grounds. At the same time, and paradoxically, adoption also is an intervention that should be prevented as much as possible, by structurally enhancing the life chances of poor families in developing countries.

Acknowledgements

We gratefully acknowledge the support of Linda van den Dries, Nicole Jaffari-Bimmel, Caroline W. Klein Poelhuis and Angy Wong in preparing this paper. We are grateful for the invaluable contributions of Marian J. Bakermans-Kranenburg to the various components of the current paper. The Adoption Meta-Analysis Project (ADOPTION MAP) is supported by grants from Stichting VSBlonds, Stichting Fonds 1818, Fonds Psychische Gezondheid and Stichting Kinderpostzegels Nederland to F.J. and M.H.vIJ in cooperation with the Adoptie Drieheoek Onderzoeks Centrum (ADOIC; www.adoptionsresearch.nl). Marinus van IJzendoorn is supported by the NWO/SPINDOZA Prize of the Netherlands Organisation for Scientific Research. Femmie Juffer is supported by Wereldkinderen.
Correspondence to
Marinus van IJzendoorn or Femmie Juffer, Centre for Child and Family Studies, Leiden University, P.O. Box 9555, NL-2300 RB Leiden, The Netherlands; Email: vanijzen@fsw.leidenuniv.nl

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Manuscript accepted 20 June 2006