From infancy to young adulthood : the Leiden Longitudinal Adoption Study

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General discussion

Table 1. *Summary of the included variables per chapter of the thesis.*

	Infancy	Middle childhood	Adolescence	Young adulthood
Ch. 2	Early malnutrition	Somatic problems Intelligence	Somatic problems Intelligence	Somatic problems Intelligence Socioeconomic success
Ch. 3	Maternal sensitivity Attachment	Maternal sensitivity	Maternal sensitivity Attachment	Attachment
Ch. 4				Attachment Arousal to infant crying

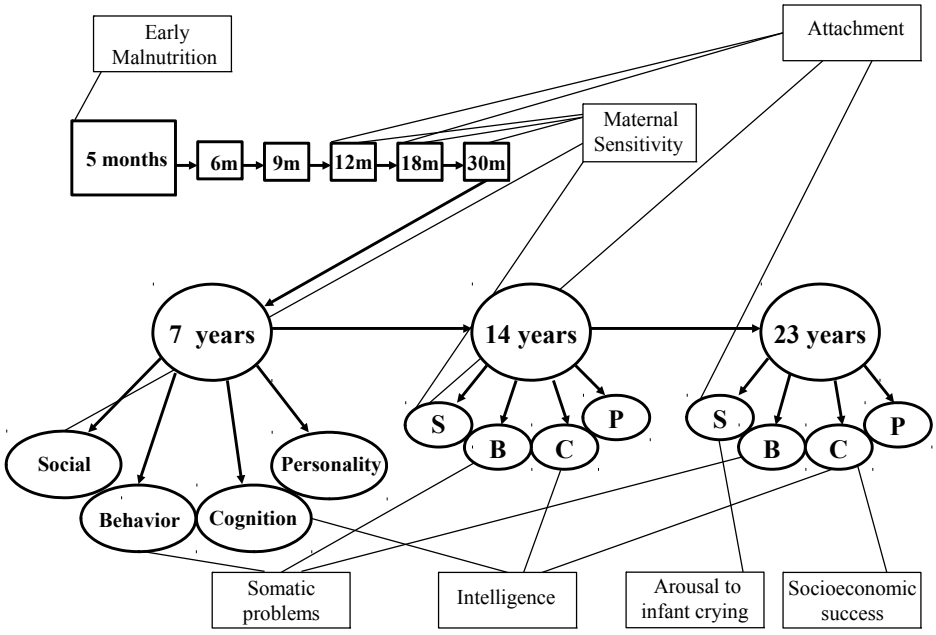

Figure 1. Design of the Leiden Longitudinal Adoption Study and variables included in the current thesis; M: Months, S: Social Development, B: Behavioral Development, C: Cognitive Development, P: Personality Development.

General discussion

Introduction

The general aim of this thesis was to examine the development of international adoptees from infancy to young adulthood. In our prospective, longitudinal adoption study we studied both longitudinal and concurrent factors influencing cognitive and social-emotional outcomes in middle childhood, adolescence and young adulthood. We used structural models in which predictive pathways bridged periods up to 22 years. The study design provided an opportunity to reveal processes underlying the development of adoptees from infancy to young adulthood.

Chapter 1 presents a review of research on the development of children exposed to various "natural experiments", such as institutional care, foster care and (early) adoption. Do children profit from a transition from institutional care to a foster or an adoptive family? We described an exceptional randomized controlled trial, the Bucharest Early Intervention Project (BEIP; Zeanah et al., 2003), in which Romanian children were randomly assigned to foster care or continued institutionalization while their development was examined over time. Outcomes showed that the foster children outperformed the institutionalized children in all major domains of development. In a series of meta-analyses the development of adopted children was compared to the development of children growing up in institutional care and in normative biological families (Van IJzendoorn & Juffer, 2006). Converging with the BEIP outcomes the meta-analyses showed that the adopted children outperformed the institutionalized children in the social-emotional and cognitive domain. The more optimal outcomes of the foster and adopted children compared to institutionalized children confirmed that parenting matters for children's development and that adoption and foster care offer chances for catch-up.

The meta-analyses on adoption also indicated that adopted children showed developmental delays compared to non-adopted, normally developing children. In particular, children adopted after their first birthday lagged behind their non-adopted peers, presumably because they had experienced more adversity compared to children adopted at younger ages. In the rest of this thesis, we focused on one of the subgroups introduced in Chapter 1, namely early-adopted children. We investigated the adjustment of international adoptees from infancy to young adulthood and examined factors influencing their adjustment in infancy, middle childhood, adolescence, and young adulthood.

Research on adoptees is relevant for several reasons. First, adoption studies shed light on aspects of development that are specific for adoptees. One of the major questions is whether adoptees with experiences of early deprivation are able to catch-up in development with their non-adopted peers after placement in a new enriched environment (Van IJzendoorn & Juffer, 2006). Second,

these studies may give insight into consequences of early adverse experiences for children's development, and possible reversibility of these effects after the children´s placement in a stable environment with permanent adoptive parents. Third, the adoption design is useful in examining the role of parent and child factors on the development of children reared outside the context of their biological family. The absence of a genetic link between the children and the adoptive parents enables us to look more precisely at the role of the rearing environment in influencing developmental outcomes.

The following discussion of the results of our empirical studies will be in line with the Introduction (Chapter 1), making a distinction between findings in the cognitive domain and the social-emotional domain of development. Physiological development is added as an extra component.

All empirical data used in this thesis was collected in a sample of 190 international adoptees, who participated in the Leiden Longitudinal Adoption Study (LLAS; started in 1986, Juffer, 1993). These adoptees were adopted from Sri Lanka (n = 116), South Korea (n = 49), and South America (n = 25) and arrived in the Netherlands before 6 months of age. Multiple measures were conducted in the first years after adoptive placement, with home visits taking place at 5, 6, 9, and 12 months, and mother and child visiting the laboratory at 12, 18, and 30 months. In the follow-up studies at 7, 14, and 23 years, four major domains of development were investigated: social development, behavioral development, cognitive development, and personality development. Figure 1 gives an overview of the design of the LLAS and all variables included in this thesis. In Table 1, the included variables are presented per chapter of the thesis.

Cognitive development

In the first study (Chapter 2), we examined long-term consequences of early malnutrition on cognitive and health-related outcomes in the LLAS. The relations between early malnutrition, cognition (intelligence in middle childhood, adolescence, and young adulthood, and socioeconomic success in young adulthood) and somatic problems were investigated in a longitudinal structural model. Outcomes revealed that early malnutrition negatively predicted IQ in middle childhood and to a lesser extent IQ in young adulthood. Early malnutrition predicted more somatic problems in middle childhood. Somatic problems predicted IQ at the consecutive waves, indicating the interdependence between these constructs.

All measures of IQ contributed to the prediction of socioeconomic success, whereas early malnutrition and somatic problems did not. Thus, early malnutrition did play a role in predicting IQ in young adulthood, but did not play a role in predicting socioeconomic success at the same age. These findings indicate that the effects of early malnutrition seem to be at least partly reversible,

and the consequences of early malnutrition do not extend to socioeconomic success later in life.

An important question is whether other studies confirm the finding that children are able to at least partly overcome early malnutrition. Studies on the Dutch Famine, the 'Hunger Winter' of 1944-1945, examining relations between severe prenatal malnutrition and cognitive functioning in adult life do provide such a framework. Stein, Susser, Saenger, and Marolla (1972) did not find differences in IQ and levels of mental retardation in men exposed versus not exposed to prenatal famine. In addition, De Groot and colleagues (2011) examined cognitive functioning at 59 years of age, and their results indicated that cognitive functioning of the exposed and the non-exposed participants did not significantly differ, with both groups showing scores that fell within the normal range. In conclusion, the effects of early malnutrition on cognition seem to be reversible in the long run when exposure to early malnutrition is of short duration and there is a transition to a more normative nurturing rearing environment.

Social-emotional development

The second study (Chapter 3) focused on longitudinal pathways from maternal sensitivity in infancy, middle childhood, and adolescence to attachment representations in young adulthood, as measured with secure base scripts in the Attachment Script Assessment (ASA; Waters & Waters, 2006), taking into account attachment in infancy and adolescence. Results showed that higher maternal sensitivity in infancy predicted more secure attachment in infancy as well as more secure attachment representations in young adulthood. In addition, higher maternal sensitivity in middle childhood predicted more secure attachment in young adulthood. Attachment in infancy did not predict attachment in adolescence and young adulthood, but attachment in adolescence and young adulthood were significantly associated. We conclude that children's attachment security might change over the early years, and that early parental sensitivity is of importance for attachment representations in adulthood. The findings of this study are consistent with attachment theory's central theme of working models of attachment, and confirm the long-term influence of early sensitive parenting for development. It should be mentioned that in all longitudinal studies on the continuity of attachment conducted so far genetically related parent-child dyads were included. Our study was the first to examine attachment from infancy to young adulthood in a sample of adoptees and their genetically unrelated parents.

The associations between sensitivity and attachment over time in our sample were also investigated in an earlier stage of development. Beijersbergen, Juffer, Bakermans-Kranenburg, and Van IJzendoorn (2012) examined the continuity of attachment from infancy to adolescence and the possible role of maternal

sensitivity in explaining continuity of attachment. In line with our findings, maternal sensitivity played an important role in explaining long-term attachment outcomes. Attachment in infancy did not predict attachment in adolescence, but maternal sensitivity added significantly to the prediction of later attachment quality.

The results of these studies raise the question: Why does early sensitivity seem to be a better predictor of attachment in adolescence and young adulthood than early attachment? Grossmann, Grossmann, and Kindler (2005) found comparable results in their longitudinal study and concluded that the prognostic significance of predictions from a single measurement of attachment in infancy can be limited (see also Bowlby 1982, p. 349). Maternal sensitivity on the other hand can be measured repeatedly and might therefore be a more powerful predictor of future outcomes. In a similar vein, a recent meta-analysis showed that stability of attachment was absent in studies with time intervals larger than 15 years, suggesting no evidence for a prototypic perspective on attachment (Pinquart, Feuβner, & Ahnert, 2013).

The discontinuity of attachment found in the LLAS needs some further discussion. The distribution of attachment classifications in infancy did not significantly differ from the normative distribution (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005), i.e., the majority of children were securely attached to the primary caregiver. This finding converges with meta-analytic findings on adoptees' attachment (Van den Dries, Juffer, Van IJzendoorn, & Bakermans-Kranenburg, 2009) showing that children adopted before the age of 12 months were as securely attached as their non-adopted counterparts. The mean score on the ASA also did not differ from means found in non-risk samples, such as undergraduate students (Groh & Roisman, 2009) and mothers (Vaughn et al., 2006). However, a temporary overrepresentation of insecure dismissing attachment compared to the normative distribution of AAI classifications was found in adolescence, which may have contributed to the discontinuity of attachment. This overrepresentation of insecure dismissing attachment in adolescence is a more common phenomenon, as indicated by a meta-analysis on attachment distributions in various risk and non-risk samples (Bakermans-Kranenburg & Van IJzendoorn, 2009).

Physiological development

In the third empirical study (Chapter 4) we examined associations between concurrent factors in young adulthood. More specifically, we tested whether attachment representations, measured with the Attachment Script Assessment, were associated with experienced arousal and sympathetic (Skin Conductance Level; SCL) and parasympathetic reactivity (Respiratory Sinus Arrhythmia;

RSA) to infant cries. Our findings suggested that secure adoptees have a well-integrated manner of responding to infant distress: there was convergence between experiential and physiological arousal, and they showed parasympathetic withdrawal during exposure to the cries. In contrast, experiential and physiological arousal were dissociated in insecure adoptees, who displayed a combination of lower perceived urgency and heightened Skin Conductance Level (SCL) compared to secure adoptees, without withdrawal of Respiratory Sinus Arrhythmia (RSA).

The dissociation between experiential and sympathetic arousal found in insecure adoptees is consistent with a deactivating style of emotional reactivity while processing attachment-related information: these persons cope with the negative emotional load of the information through cognitive suppression by shifting their attention to more emotionally neutral aspects of the information (Dykas & Cassidy, 2011). These findings provided some empirical support for the hypothesis that internal working models of attachment, presumably based on the experiences with primary caregivers, explain individual differences in the way attachment-related information is being processed (Bowlby, 1969/1982).

Why do individuals with low scores on the ASA use a deactivating style of emotional reactivity in reaction to infant cry sounds? Dykas and Cassidy (2011) suggested that insecure individuals process attachment-related information in a negatively biased manner, which leads to a hyperactivating response. However, if the attachment-related stressor is likely to cause psychological distress, these individuals will partly or completely exclude the attachment-related information from further processing. Moreover, it could be argued that different types of insecure attachment (dismissing versus preoccupied) lead to different styles of emotional responding, with dismissing individuals diverting their attention away from attachment (deactivation) and preoccupied individuals exaggerating their attachment signals (hyperactivation; Kobak, Cole, Ferenz-Gilles, & Fleming, 1993). Based on this argument, we would expect that individuals with low scores on the ASA in our sample have dismissing attachment representations.

To further investigate this assumption, we linked the adoptees' attachment classifications (secure, insecure dismissing, and insecure preoccupied) on the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996; Hesse, 2008; Main, Goldwyn, & Hesse, 2003) in adolescence to their ASA scores in young adulthood. Outcomes revealed that adoptees with dismissing classifications on the AAI were the ones with the lowest mean score on the ASA (M = 3.57, SD = 0.82), whereas mean ASA scores of the adoptees with secure classifications (M = 3.98, SD = 0.92) and adoptees with preoccupied classifications on the AAI (M = 3.99, SD = 0.77) were largely comparable. Although the group of adoptees with preoccupied classifications was relatively small (n = 13) and there was a time interval of around 9 years between the assessments of attachment, these

outcomes raise the question where on the continuum of the ASA scores the different insecure subtypes can be placed.

In recent studies, physiological measures have been used to index emotional responding, potentially broadening our understanding of variation in emotional reactivity as a function of attachment security. Following this line of research, Beijersbergen, Bakermans-Kranenburg, Van IJzendoorn, and Juffer (2008) examined the link between attachment and emotional reactivity in our sample when the adoptees were adolescents. Physiological reactivity during the AAI and the Family Interaction Task (FIT; Allen et al., 2003), a mother-adolescent conflict interaction task, showed that dismissing adoptees had lower reactivity during the AAI than the secure adoptees, whereas they showed more reactivity during the FIT. Although effects were found on a different physiological indicator (Inter-Beat Interval; IBI) than the one we used in young adulthood, the superficial pattern of responding in dismissing adoptees during the AAI may be consistent with the idea of exclusion of attachment-related information from further processing, pointing to a defensive style of emotional reactivity. The dismissing adolescents could not effectively use defensive processes during direct interaction with their mother, resulting in heightened physiological arousal.

Taken together, our studies on physiological reactivity in adolescence and young adulthood revealed that secure individuals show more efficient responding to attachment-related stressors, whereas the pattern of responding found in insecure dismissing individuals fits the information processing strategy of defensive exclusion. According to Bowlby (1980), defensive exclusion of information from further processing can either be complete or less complete dependent on the specific content of the attachment-related stressors, which could explain the difference in reactivity seen in dismissing adoptees in response to the AAI versus infant cry sounds. During the AAI (14 years), dismissing adoptees showed lower experiential and physiological arousal than secure adoptees, which converges with the idea of complete exclusion. In reaction to exposure to repeated bouts of infant cry sounds (23 years), the insecure (dismissing) adoptees showed lower experiential arousal in combination with heightened physiological arousal, consistent with less complete exclusion. The pattern of responding found in the dismissing adoptees during the FIT (14 years) can either be part of a hyperactivating strategy or a strategy marked by less complete defensive exclusion. According to Roisman (2007), increases in heart rate might be related to a hyperactivating strategy. Future research should examine more systematically which type of attachment-related stressors leads to which strategy applied by insecure dismissing individuals, in order to get a clearer view on their patterns of emotional reactivity in specific circumstances.

Strengths and weaknesses

Using data from a longitudinal, prospective study across 23 years is a major strength of our set of studies. The design enabled us to investigate long-term adjustment of adoptees and predictive pathways explaining adaptation up to young adulthood. Longitudinal studies with such a large time span as in the current study are rare; the Minnesota study (Sroufe, Egeland, Carlson, & Collins, 2005) and the Dunedin study (Moffitt et al., 2010; Silva & Stanton, 1996) belong to the very few that also cover such a unique design. These studies in which children are followed from infancy to adulthood may reveal processes underlying child development and adaptation.

Working with longitudinal data also implies dealing with decisions made in previous waves of data collection. In our longitudinal structural models we had to work with the available data, even if constructs were not completely similar over time, constructs were not measured using the same informants at all waves, or constructs were not measured at all. For example, we would have preferred to include a more physical dimension of health in our model focusing on cognitive outcomes (Chapter 2). Likewise, in our model with constructs related to social-emotional development (Chapter 3), attachment in middle childhood could not be added, because no valid attachment measure for this age group was available at that point in time. Overall, we tend to think that the positive aspects of the longitudinal design outweigh the limitations discussed here.

Another strength of this thesis is that we were able to examine transactional processes between genetically unrelated parents and children and focus on factors underlying developmental outcomes in a relatively large sample of international adoptees followed from infancy to young adulthood, using multiple measures (including observations, tests, interviews, and questionnaires) at each of the waves. The studies on attachment representations in young adulthood (Chapters 3 and 4), as measured with the Attachment Script Assessment (Waters & Waters, 2006), belong to the first that examined associations between this relatively new measure of attachment and other aspects of social-emotional and neurobiological development.

Conclusion

In sum, we examined the development of international adoptees from infancy to young adulthood, and factors influencing developmental outcomes in middle childhood, adolescence and young adulthood. The results for cognitive development (Chapter 2) did show that early malnutrition, an example of early adversity, influenced cognitive and health-related outcomes. At the same time, our outcomes revealed that the consequences of early malnutrition may not extend to socioeconomic success later in life, and support the idea that the human brain

is capable of adapting to changing environmental influences. This adaptability is not limitless: the longer children are exposed to early adversities, the more difficult it becomes to redirect their development to a normal trajectory (Nelson, Bos, Gunnar, & Sonuga-Barke, 2011). Earlier placement in a positive family environment is accordingly associated with better developmental outcomes (Van IJzendoorn & Juffer, 2006). The adoptees included in the Leiden Longitudinal Adoption Study were exposed to few early adversities due to their early adoptive placement, and the combination with the nurturing rearing environment of a permanent adoptive family resulted in positive cognitive and socio-emotional outcomes (Chapters 2 and 3). Our results for longitudinal and concurrent predictors of attachment representations in young adulthood (Chapters 3 and 4) clearly pointed to this role of the nurturing family environment in predicting social-emotional outcomes. In particular, maternal sensitivity proved to be meaningful in the prediction of later attachment security, suggesting that high parenting quality is important, also in families where children do not share a common genetic basis with their parents. In sum, adoption can be seen as a positive intervention and the (adoptive) family environment matters for children growing up from infants to young adults.

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