6 General Discussion
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The aim of this thesis was to study attachment relationships of foster children, linking different conceptualizations of attachment. An important threat to the development of attachment is the occurrence of unplanned disruptions in foster placements. Therefore risk and protective factors associated with placement breakdown were identified. Although the presence of attachment is mostly presumed in normative parent-child relationships, attachment relationships of children with their foster parents are supposed to be less established. Attachment may be conceptualized as an emergent property of relationships, namely that the relationship is involved in the regulation of children’s affect. This regulatory function was studied at the physiological level. Indicators of regulation in foster children were compared with similar indicators in children raised from birth by the same caregivers. Furthermore, differential physiological responses to strangers and (presumed) attachment figures were tested as indicators of children’s experiences of being attached. Individual differences in physiological responses of biological and foster children were examined in relation to respectively the quality of attachment and symptoms of attachment disorder. Further, it was examined whether factors associated with the quality of attachment in normative populations were also associated with quality of attachment in a foster care sample. Finally, symptoms of attachment disorder were examined in relation to the presence of behavior problems as well as the quality of the caregiving environment.

In this chapter, the findings of the four studies are summarized and discussed. Next, an analysis of strengths and limitations of the present thesis is presented followed by a general conclusion. The final part of this chapter focused on possible clinical implications of the thesis.

Summary and conclusions

The thesis comprised four studies, including a review and meta-analysis and three empirical studies.

The first study (Chapter 2) consisted of a review and meta-analysis on placement disruptions in family foster care. The literature was examined in order to summarize risk and protective factors associated with placement breakdown, that is unplanned terminations of a foster placement. In order to progress from merely comparing the relative importance of separate risk and protective factors to assessing risk and protective mechanisms and processes (Rutter, 2000), we distinguished distal and proximal factors in our review. Further, a meta-analytical approach was used to examine the combined effect sizes of factors that were found across multiple studies. Additionally, the relation between the heterogeneity of the findings across the studies and differences in study characteristics were discussed and analyzed quantitatively. Although outcomes of the 26 included studies of 20,650 foster children were highly diverse, it was possible to provide evidence for the predictive power of several child and placement
characteristics. We found that older age of the foster child and experiences of previous residential care or placements were risk factors for placement breakdown. The strongest predictor of placement breakdown was the presence of behavior problems, especially when controlled for other factors. With regard to possible protective factors, it was concluded that in particular the quality of caregiving may protect children from placement breakdown. Surprising in the context of existing views and ideas in the field of foster care was the lack of evidence for kinship care as a protective factor. This warrants further research into the role that biological parents may continue to play and the type and amount of support needed for kinship foster parents. Overall, studies using multivariate models appeared better in determining the prognostic value of individual predictors. However, the use of multivariate models might in some studies also have obscured important effects, especially in models with both distal and proximal factors. It was concluded that there is a need for models that specify the possible role of several predictors. An important suggestion in this context concerned the potential role of attachment and caregiving in mitigating risk factors for placement breakdown. The nature of attachments of foster children as well as associations with caregiving aspects were examined in the subsequent studies of the present thesis.

The empirical studies were based on two samples. Sample I included 50 (foster)parents with their biological children, aged 36 to 81 months whereas Sample II included 61 foster parents with their foster children, aged 26 to 88 months. The data were obtained during a home-observation and a laboratory visit. The Attachment Q-set [Waters, 1995; Waters & Deane, 1985] was applied to the home-observation in order to measure quality of attachment. Symptoms of attachment disorder were assessed by telephone with the Disturbances of Attachment Interview [DAI; Smyke & Zeanah, 1999]. Other child characteristics including temperament and behavior problems were assessed by questionnaires. At the lab, a range of indices including heart rate (HR) and measures for the parasympathetic nervous system (respiratory sinus arrhythmia; RSA) and the sympathetic nervous system (pre-ejection period; PEP) were used to assess physiological regulation during a separation-reunion procedure based on the Strange Situation [Ainsworth, Blehar, Waters & Wall, 1978], which was followed by a parent-child interaction task for the measurement of parental sensitivity, using the Three Boxes [NICHD Early Child Care Research Network, 1999, 2003].

The study reported in Chapter 3 (Sample I) focused on physiological regulation within the parent-child relationship. Autonomic reactivity was studied on separation from and reunion with the biological parent. Separation is supposed to disrupt multiple regulatory processes within parent-child relationships [Hofer, 2006]. We examined the regulatory processes within the autonomic nervous system (ANS) in a modified Strange Situation procedure. The findings indicated specific patterns of physiological regulation. The effects of separation were most prominent, and could be mainly ascribed to the parasympathetic nervous system (parasympathetic withdrawal). The effects of reunion on HR were more difficult to ascribe to
a specific part of the ANS. The lack of PEP responses suggested that the modified Strange Situation, and more specifically separation from the attachment figure was not threatening enough to activate the sympathetic nervous system. The variability in HR changes on reunion was partly explained by younger age, indicating higher HR increases for younger children. The combination of quality of attachment and temperament was also significantly related to HR changes on separation and reunion. However, this effect was not convincing because of the presence of multivariate outliers. Overall, changes in physiological arousal on separation and reunion with the attachment figure occurred in non-random patterns. This indicated that there may be a normative pattern of ANS responses that accompany activation of the attachment system. With regard to the specificity of the physiological responses on separation and reunion, it should be noted that there were only significant differences between attachment figure and stranger on HR. However, in a larger sample with biological and foster children (see Chapter 4), the effects on RSA were also significantly different on separation from the (presumed) attachment figure as compared to separation from the stranger. It could be concluded that physiological responses, at least on separation, differentiate between attachment figures and strangers and thus may function as an indicator of attachment in caregiver-child relationships. Based on Porges’ model (2004), the finding that differences between parent and stranger in RSA were not found on reunion may further indicate that the social engagement system is not exclusively for parent-child relationships.

The third study (Chapter 4) started with comparisons between physiological regulation on separation and reunion in foster and biological children. The findings revealed both differences and similarities between foster and control children. Similarities were found on HR reactivity on separation, indicating general arousal of the cardiovascular system. Differences were found in the variability of the HR changes on the modified Strange Situation, indicating larger individual differences in foster children. Other differences between the groups concerned RSA reactivity across the procedure, indicating that foster children showed less parasympathetic withdrawal than control children. These results are consistent with the hypotheses based on Porges’ model and support the idea of less adaptive ANS regulation in foster children. However, there were no differences between foster and control children on the specificity of the physiological responses to separation and reunion with the presumed attachment figure and the stranger.

The second part of the third study examined individual differences in physiological responses within the foster group. PEP increases across the procedure were found to be related to symptoms of disinhibited attachment, indicating that the Strange Situation was especially for these children not threatening enough to activate the sympathetic nervous system. With regard to the parasympathetic part of the ANS was found that disinhibited foster children with short foster placements showed increased RSA whereas disinhibited children with long placements showed no clear activation or withdrawal of the parasympathetic system. The
opposite was found for children without symptoms of attachment disorder, who showed RSA decreases when relatively short in placement and RSA increases when longer in placement. Exploration of ANS reactivity on separation and reunion with the stranger revealed that children without symptoms of disinhibited attachment showed no RSA reactivity on separation. By way of contrast, children with symptoms of disinhibited attachment and short placements showed RSA decreases on separation from the stranger. The results indicated that even long-term placement may not allow the emergence of regulation within the relationship with foster parents in children with disorders of attachment.

The fourth and final study of this thesis (Chapter 5) focused on attachment relationships of foster children by examining two conceptualizations of attachment in relation to associated factors of attachment in normative parent-child relationships. Foster parent sensitivity was positively associated with attachment security but only when controlling for symptoms of attachment disorder (Reactive Attachment Disorder; RAD), including the subtypes disinhibited and inhibited as well as symptoms of secure base distortions. Symptoms of secure base distortions in particular suppressed the association between sensitivity and attachment security. With respect to outcomes of attachment in foster children, it was found that symptoms of RAD and secure base distortions were related to externalizing and internalizing behavior problems as reported by the foster parents. Attachment security was negatively associated with externalizing behavior problems, but the effects did not remain significant when controlled for attachment disorders. Findings based on teacher report of behavior problems indicated strong negative associations between attachment security and externalizing behavior problems, even when controlled for symptoms of attachment disorder. In contrast, symptoms of RAD and secure base distortions were found to be related to teacher reported internalizing behavior problems. In conclusion, determinants and outcomes of attachment in normative parent-child relationships could also be identified in foster children provided that symptoms of RAD and secure base distortions were included. Finally, the two conceptualizations of attachment were found to be uniquely associated with both parental sensitivity and behavior problems.

Strengths and limitations

The current thesis has yielded new findings regarding the nature of attachment relationships of children in foster care. Until now, the focus in attachment research was almost exclusively on individual differences in attachment, the so-called quality of attachment. This thesis contributes to further generalizations of attachment theory and research to non-parental relationships by elaborating and testing criteria and conceptualizations of the status of attachment. One of these conceptualizations referred to the regulatory function of attachment relationships. This thesis extended earlier studies on the link between physiological regulation and attachment by including indices of the sympathetic and the parasympathetic nervous
system. Moreover, the study presented in Chapter 3 is the first human study in which physiological responses to attachment figures and strangers were directly compared in order to determine the specificity of the physiological effects. The studies that were described in Chapter 3 and Chapter 4 of the thesis provide some empirical evidence for Porges’ model of the role of the vagal system by confirming specific hypotheses on the link between the vagal system and social engagement behavior.

Another contribution of the current study refers to the different conceptualizations of attachment that were studied. Physiological responses on separation and reunion have revealed information about potential physiological mechanisms that may underlie attachment relationships with less clear attachment status. Moreover, the inclusion of symptoms of attachment disorders in addition to the quality of attachment has revealed unique information about the patterns of attachment behavior in foster children, especially because this study examined associations with other child behaviors as well as the quality of the caregiving environment.

Research on foster children can make a unique contribution to the field of attachment by providing a large range of experiences that can be covered by different conceptualizations of attachment. Symptoms of attachment disorder may represent abnormal, pathogenic experiences whereas attachment security may represent normative variation in attachment. Future studies should not only examine the relations between these conceptualizations, but should also focus on the possible link between the developmental course of behaviors associated with attachment disorder and the development of secure base behavior.

A limitation of the current thesis in this context is the lack of Strange Situation classifications [Ainsworth et al., 1978], which was for many years the only accepted classification procedure to assess quality of attachment. Especially important may be the relation between disorganized attachment and symptoms of attachment disorder [Boris et al., 2004; Van IJzendoorn & Bakermans-Kranenburg, 2003]. The choice was made to focus on attachment behavior in the home, rated using the attachment Q-set, because these data were collected independently from the physiological data collected during the adapted Strange Situation.

Another limitation may be that this study did not examine attachment relationships of foster children with their biological parents. It should be noted that the quality of these previous attachment relationships might have influenced the quality of the foster parent-child relationship as well as possible outcomes of these relationships. This may be also the case as regards symptoms of attachment disorder. Symptoms of attachment disorder as reported by the biological parents might have revealed more information about the extent to which these symptoms are relation- or child specific and can be generalized to other relationships. However, it could also be reasoned that the absence or presence of symptoms of attachment disorder may already reflect experiences within previous relationships, because the supposed cause of symptoms of attachment disorder is a history of problematic or even
A final limitation referred to the cross-sectional character of the current studies. In contrast, Stovall and Dozier [2000] have shown that the study of attachment over time can greatly enhance our knowledge on the process of developing secure attachment behavior with a new caregiver. Future studies should focus on the process of attachment formation to new caregivers from the start of foster placements by including also indicators of the status of attachment as well as several other child, parent and placement characteristics. However, in the context of the current thesis, such a research design was not feasible because of difficulties in obtaining informed consent. In many cases, emotions and feelings concerning the placement in biological and foster parents, which are most often the strongest at time of placement, were cited as reasons to not provide informed consent by both biological as well as foster parents.

**General conclusion**

The present thesis is a first attempt to study the status of attachment apart from the quality of the parent-child relationship based on attachment theoretical conceptualizations, clinical conceptualizations as well as neurobiological models. There was some evidence for differential physiological responses to attachment figures, as predicted by attachment theory. Further, the present study allowed testing Porges’ model of the link between the vagal system and social engagement and attachment, showing that foster children and especially foster children with signs of attachment disorder showed less adaptive vagal regulation during a separation-reunion procedure based on the Strange Situation than children in normative populations. The findings indicate that the combination of conceptualizations of attachment can reveal unique information about the nature of attachment in foster children. Based on the associations between the measures of attachment as well as the links with child behavior problems as an outcome, it can be concluded that attachment security and disorders of attachment assess distinct, but in the case of secure base distortions, overlapping dimensions of the same attachment construct. With regard to the status of attachment, both behavioral and physiological results suggest that the status of relationships as attachment relationships may be derived from clinical conceptualizations or more indirectly from physiological indicators of regulation within the foster-parent child relationship. Including several approaches of attachment in children with less established relationships will lead to better identification of children in need of intervention as well as to the provision of more specific clues for support.

**Clinical implications**

The thesis contributes to the further development of one of the first screening instruments of symptoms of attachment disorders in young children, the Disturbances of Attachment Interview [Smyke & Zeanah, 1999]. The findings can be used to further validate the criteria
for attachment disorders, including the subtypes of RAD as well as alternative criteria for attachment disorder. Especially the findings on vagal regulation in foster children with and without symptoms of attachment disorder may validate the existence and nature of disinhibited attachment.

Given the findings concerning the uniqueness of the different conceptualizations of attachment, assessment of both quality of attachment and clinical disorders of attachment should be part of evaluations of foster children's relationships with foster parents. It should be mentioned that stability in caregiving in itself did not seem sufficient to allow children to develop adaptive regulation within the foster parent-child relationship, if these children showed symptoms of disinhibited attachment disorder. This cast doubt on some children's abilities to develop attachment relationships with new caregivers. Despite the limitation of cross-sectional data, this may be confirmed by the finding that children with symptoms of attachment disorder seemed not to benefit from parental sensitivity, in terms of developing a secure attachment relationship with their foster parent. In general, these findings suggest that common interventions aimed at enhancing foster caregivers' sensitivity and nurturance may not be as effective as regards children with symptoms of attachment disorder. In addition to sensitive parenting, Zilberstein (2006) mentioned the possible influence of other caregiving characteristics including positive discipline, which can be described in terms of social praise, rewards of appropriate conduct, consequences for misbehaving and discussing of problems (Linares, Montalto, Rosbruch & Li, 2006). Future longitudinal studies should include these or other aspects of the caregiving environment in order to examine how these factors may influence child's behavior and the development of (secure) attachment relationships. Because of the interrelations between symptoms of attachment disorder, behavior problems and placement breakdown, foster care practice needs to focus on multiple domains in order to prevent children from a vicious circle of breakdown and behavioral and psychological pathology.

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