The main objectives of this project were a better understanding of 1) the development of individual differences in mother-infant attachment during the first year of life, 2) the role of the child herein, and 3) the development of dyadic stress regulation strategies represented by differences in infant attachment quality into more internalized self-regulation strategies when children are 5 years old.

These aims address important gaps in current knowledge about the development of infant-mother attachment and its role for children’s socio-emotional development. Although it is now well-established that individual differences in attachment quality can have long-lasting consequences for social relationships and mental health across later life, questions remain about how such differences develop during the child’s first year of life. Attachment quality is typically assessed with the Strange Situation Procedure (SSP) when children are 12 and 24 months old. The SSP is designed to trigger attachment behavior by introducing the child to mild stressors, i.e. an unfamiliar environment, an unfamiliar person, and two short separations from the mother. On reunion with the mother children show attachment behavior, reflecting different behavioral strategies. Securely attached children are able to use the mother as a ‘safe haven’, a source of comfort when they are in distress, and will therefore seek contact and proximity with the mother on reunion. This confidence in the mother as a source of comfort is undermined in insecurely attached children based on their past caregiving experiences. As a result, these children will use regulation strategies, i.e. avoidance or angry ambivalence, which developed to minimize rejection by an unresponsive or inconsistently responsive mother. In disorganized children, attachment strategies fail, as children are thought to be in the paradoxical situation of being afraid of their source of comfort, which results in contradictory or stereotypical behavior without function, or even overt signs of fear. Both insecure and disorganized attachment strategies are less effective in alleviating distress, because contact or proximity with the mother is either not achieved or because children are too angry to be calmed down by the contact.

Less is known about the interactive processes between mother and child that are thought to lead to the qualitative differences assessed with the SSP. Traditionally, attachment theory highlights the role of the mother, and in particular her sensitive responsiveness, i.e. the ability to pick up the child’s attachment signals and to respond to them adequately and promptly. However, as maternal sensitivity only explains part of the variation in attachment quality, there is a need for additional factors that contribute to the development of qualitative differences in attachment.

It is assumed that internal working models underlying qualitative differences in attachment develop through repeated interaction between child and caregiver during the first year of life, but empirical evidence for these processes is still scarce. This project aims to identify behaviors of mothers and infants as well as dyadic behavioral patterns in early interactions, which may predict individual differences in attachment at one year of life.

This is addressed using a longitudinal study conducted at the University of Copenhagen Babylab. This study follows 90 mothers and their children from Copenhagen, Denmark, since early in life. For the first two questions, i.e. how individual differences in attachment quality develop during the first year and what the role of the child is in these processes, we use detailed micro-analyses of mothers’ and children’s behavior in face-to-face interactions when the child was 4 months old. Different modalities are examined, such as facial affect, vocalizations, gaze, touch, and spatial behavior. Infant attachment is assessed when children were 13 months old using the SSP. Part of the raw data to answer these questions was already available, i.e. manual micro-codings of infant facial affect, vocalizations and gaze, automated codes of spatial behavior and infant attachment classification, the latter of which was previously coded by the fellow. Within the current project, additional codings were made, and raw data were used to construct summary codes and to identify dyadic behavioral patterns.

Preliminary analyses identified behavioral patterns in 4-months mother-infant face-to-face interactions that were related to attachment classification at 13 months. Interestingly, later avoidant children gazed more at their mother, displayed more negative facial affect and more vocal protest in 4-months interactions than later secure infants. These findings are somewhat surprising considering that avoidant children are characterized by turning away from the mother or ignoring her in the SSP. However, at 4 months of age these behaviors may be a reaction to unresponsive maternal behavior, trying to engage her.

Averting gaze with head down was associated with attachment disorganization, whereas congruent behavior at 4 months was associated with a lower risk of attachment disorganization at 13 months, e.g. gazing at the mother while also turning the body towards her, but also turning the body away, when gazing away. This finding is in line with the expectations, as disorganized attachment is characterized by incongruent behavior such as approach and avoidance at the same time, and by signs of fear, such as keeping the head down. Instances of “Chase and Dodge”, a dyadic behavioral pattern characterized by maternal approach and infant avoidance, were more often found in future resistant infants and less often in future avoidant infants compared to secure infants as expected, although differences were not statistically significant. So far, analyses focused on dyadic and infant behavior, but maternal variables and additional child variables (e.g. touch and maternal facial affect) are to be examined.

Findings to this point indicate that behavioral precursors of later attachment classification may occur in early mother-infant interactions. This adds to the understanding of how attachment internal working models may develop during the first year of life and help explain individual differences in attachment quality at one year of age. Results may have implications for infant mental health if both risk and protective behaviors in infants, mothers and dyads can be identified early in the child’s life and targeted by interventions.

To address the second aim of this project, i.e. to examine whether early attachment based dyadic regulation strategies translate into differences in self-regulation abilities later in childhood, we set up a follow-up assessment for the longitudinal study running at the University of Copenhagen Babylab. Participants are invited again for an assessment when children were 5 years old. Assessments are conducted by a PhD student together with a team of research assistants coordinated and supervised by the fellow and researcher in charge.

Children were invited together with both parents to provide a family perspective and examine not only mother-child interactions, but also father-child interactions. During the 5-year follow-up, children’s regulation abilities are assessed in different ways. First, dyadic regulation abilities when together with the parent are assessed in a frustration paradigm, where children have to solve a puzzle too difficult for their age. Mother-child dyadic regulation is additionally assessed using the Still-Face paradigm, in which mothers are asked to hold a ‘still face’ for a few minutes and not to react to the child. Dyadic repair can be observed in the ‘reunion’ episode following the still face. Self-regulation without the parent present is assessed using a delay of gratification paradigm, the famous marshmallow test. During these tasks, physiological reactivity and regulation abilities are assessed by salivary cortisol and heart rate. In addition, children’s current attachment security is assessed with a story completion task. In this task, children have to complete story stems with attachment themes that allow to assess children’s representation of relationships between children and adults. So far, data-collection is on time, and about 80% of all children were examined. Using the follow-up data, associations of infant attachment classifications with different aspects of regulation abilities in preschool age can be examined.