



Attachment and physiological reactivity to infant crying in young adulthood: Dissociation between experiential and physiological arousal in insecure adoptees



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HIGHLIGHTS

- Variation in attachment is associated with differences in arousal to infant crying.
- In secure adoptees experiential arousal and physiological arousal to infant crying are integrated.
- In insecure adoptees experiential arousal and physiological arousal to infant crying are dissociated.
- Insecure adoptees use a deactivating style in response to infant crying.

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ABSTRACT

The associations between attachment representations of adopted young adults and their experiential and physiological arousal to infant crying were examined. Attachment representations were assessed with the Attachment Script Assessment (ASA), and the young adults listened to infant cries, during which ratings of cry perception were collected and physiological reactivity was measured. Secure adoptees showed a well-integrated response to infant distress: heart-rate increases and respiratory sinus arrhythmia (RSA) withdrawal were coupled with heightened perception of urgency in these individuals. In insecure adoptees RSA withdrawal was absent, and a combination of lowered perceived urgency and heightened sympathetic arousal was found, reflecting a deactivating style of emotional reactivity. Overall, our findings support the idea that internal working models of attachment explain individual differences in the way attachment-related information is processed.

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1. Introduction

Central to attachment is children's need for adult support when they struggle with negative feelings. Whereas parental support – e.g., comfort in case of distress – is expected to contribute to secure child attachment and emotional self-regulation, the lack of such support may reduce children's sense of security and may increase the risk of less effective emotion regulation [11]. Based on their experiences with caregivers in (early) childhood and adolescence, individuals develop emotion regulation patterns that are shaped by the security of the relationship with their main attachment figures to cope with stressful situations without becoming too overwhelmed by negative emotions [8,19]. In recent studies, physiological measures have been used to

index emotional responding and regulation, potentially broadening our understanding of variation in emotional reactivity as a function of attachment security (e.g., [1,27,48]). In the present study we tested whether young adults' attachment representations, as measured with secure base scripts in the Attachment Script Assessment (ASA; [70], also known in the literature as Secure Base Script), were related to their experiential and physiological arousal to emotional stimuli.

The ASA [70] is a cost-effective alternative to the gold standard of adult attachment assessment, the Berkeley Adult Attachment Interview (AAI; [25,31,44]). The concept of a secure base script is derived from attachment theory [67] and makes use of insights from cognitive science, in particular research on mental models. Similar to the idea of internal working models [8], a secure base script is considered a mental representation that is formed based on an individual's history of secure base support [68]. Consistent and coherent support leads to a script that is easily accessible and includes the idea that the primary caregiver will be there for support, especially in times of need. Inconsistent or

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ineffective support leads to a script that is incomplete and less accessible or includes more negative expectations about significant others [70].

1.1. Attachment and emotional reactivity

Individual variation in young adults' attachment representations as reflected in different styles of emotional responding should become clearest when young adults are confronted with attachment-related stressors [26,40]. Infant crying is such a stressor; infant cries evoke physiological arousal in adults, both males and females, and parents and non-parents [24,27]. Infant cry sounds provide information about the infant's health and level of distress [28,47], and are produced to elicit caregiving responses [8,47,71]. For example, high-pitched cry sounds are indicative of higher levels of infant distress [74], and adults are likely to perceive these signals as more urgent and in need of more prompt caregiving behaviors than low-pitched cries [49]. There is also evidence that adults become increasingly sensitized to repeated infant distress signals (e.g., [49]). Repeated exposure to cry sounds is therefore considered as more stressful and tends to evoke heightened physiological arousal. Our study design was based on the study by Out et al. [49] using the same cry paradigm, which showed significant differences in responses across blocks instead of between frequencies.

According to Dykas & Cassidy [19], individuals process social information in a way that is congruent with their attachment-related experiences: secure individuals process it in a positively biased manner, whereas insecure individuals process it in a negatively biased manner. Congruent with their early negative experiences, insecure individuals can become emotionally stressed while processing negative attachment-related social information, leading to a hyperactivating response [17]. However, if the information is attachment related and emotional components of the information are likely to cause psychological distress, insecure individuals might use an emotional response style characterized by defensive exclusion of the information from further processing, also known as a deactivating style [9,19]. Thus, dependent on the type of attachment-related information received (non-threatening versus threatening), insecure individuals will either process information using a strategy marked by hyperactivation or marked by deactivation [40].

Several studies have shown links between an adult's AAI classification as insecure, either dismissing or preoccupied, and physiological reactivity to attachment-related stressors. Deactivating strategies during the AAI were associated with heightened skin conductance levels (SCLs) in reaction to negative attachment stimuli [1,18,34,55,56], whereas hyperactivation strategies were associated with increases in heart rate [55]. Using the ASA to assess attachment, Groh and Roisman [27] found that low scores on the ASA were uniquely linked to heightened electrodermal reactivity (SCL) in individuals listening to infant crying.

Besides electrodermal activity as a measure of sympathetic activity, parasympathetic activity (respiratory sinus arrhythmia; RSA) and its link with attachment are relevant. It has been suggested that secure individuals show clearer signs of parasympathetic withdrawal or vagal tone (in combination with indices of mild sympathetic responses) when confronted with attachment-related stressors, which might be an indicator of more adequate responding to external stressors in these individuals compared to insecure individuals [37,51]. However, a replicable pattern of associations between quality of attachment and parasympathetic activity has not been established yet [17,32,48,55].

1.2. The present study

In our study we tested whether attachment representations were associated with experiential arousal and both sympathetic and parasympathetic reactivity to infant cries in adopted young adults. We examined both reactions to the stressor and recovery, as previous studies revealed that differences in attachment styles may predict the

extent to which levels of physiological arousal return to baseline levels after exposure to the stressor (e.g., [53]).

Attachment relationships in adoptees are of special interest, because these individuals experienced separation from or loss of their birth parents, which may negatively affect subsequent relationships with primary caregivers [8]. In addition, exposure to early adversities, such as institutional care, maltreatment, and neglect, may have negative long-term consequences for social and emotional development [41], or more specifically may increase the risk for insecure attachment in these children (for a meta-analysis see [63]). We examined the adoptees' working models of attachment in young adulthood, after they were raised by their genetically unrelated adoptive parents. As a consequence, possible associations are not confounded by genetic influences that play a role in the transmission of attachment and emotional reactivity across generations [30,46]. On the other hand, it might be possible that within the individual adoptee, the same set of genes contributes to both attachment security and responding to infant crying. A recent twin study indicated that genetic relatedness may play a role in explaining individual differences in attachment beyond childhood [21], and a twin design also showed that there is a substantial genetic component of adults' physiological reactivity to infant cry sounds [49].

Based on the positive experiences with their attachment figures, secure adoptees were expected to show optimal emotional reactivity [8,35], processing the attachment-related information in a relatively open manner [19]. That is, we expected them to show parasympathetic withdrawal during exposure to the cries, and convergence between experiential and physiological arousal, with both experiential and physiological arousal being higher during exposure to the cries versus baseline and recovery, and higher in later versus previous blocks of cry sounds due to repeated exposure [49]. Insecure adoptees were expected to display less optimal emotional reactivity, characterized by either a hyperactivating or a deactivating strategy [40]. In case of hyperactivation, individuals will display both heightened experiential and physiological arousal in reaction to the infant cries. In case of deactivation, exclusion of the attachment-related information from further processing will result in heightened physiological arousal in the absence of heightened experiential arousal [16], or flattened experiential and physiological arousal to the infant cries, dependent on how complete the exclusion of information is [9].

2. Method

2.1. Participants

In the Leiden Longitudinal Adoption Study 190 internationally adopted children (100 girls) were followed from infancy to the age of 23 years (for details on earlier phases of the study, see [4,36,61]). The children arrived in the Netherlands before the age of six months ($M = 10.28$ weeks, $SD = 5.42$) and were adopted from Sri Lanka ($n = 116$), South Korea ($n = 49$), and Colombia ($n = 25$). The adoptive families were recruited in a non-selective way through Dutch adoption organizations. Children's placement in adoptive families was based solely on the parents' position on the waiting list of the adoption agency, and not on characteristics of the parents or children. All parents were Caucasian and came from predominantly middle-class socio-economic backgrounds.

The original sample consisted of 160 families in infancy. At 7 years, 30 adoptive families from the same population were added to the sample. Compared to the original infancy sample no differences in background variables were found. Of these 190 adoptive families, 166 provided measures of sensitivity in middle childhood (13% attrition), and 152 participated in adolescence (20% attrition). At the current assessment at 23 years, 117 adoptees participated in the study. Long traveling distances, lack of interest, or time constraints were the major reasons for nonparticipation.

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