Effects of attachment related stress on performance in emotion recognition - using idiosyncratic stressors in adults

Tobias Nolte* (tobias.nolte@yale.edu), Peter Fonagy", Sidney J. Blatt", Helena Rutherford*, Linda C. Mayes*

* Yale Child Study Center,  Anna Freud Centre and University College, London,  " Yale Medical School, Department of Psychiatry

Background:

Following Fonagy's conceptualization of the decoupling effect of an activated attachment system on the capacity to mentalize (Fonagy et al., 2006) this presentation presents results of our research project designed to study this relationship systematically using Event-Related-Potentials (ERP) to draw conclusions about the temporal character of their activation using Event-Related Potentials (ERP) in EEG and to indicate the possible spatial location of this activity.

By investigating 40 adult subjects we studied the differential role of attachment representations (measured by the revised Experience in Close Relationships Questionnaire, ECR-R, Fraley et al., 2000) in moderating the influence of attachment distress (evoked with an idiosyncratic attachment induction, adapted from Sinha et al.) on subsequent performance in a mentalization task. The guiding hypothesis was that insecure and disorganized patterns of attachment manifest themselves in a hyper-arousal of the attachment system with subsequent shutting down effects in reflective functioning compared to securely attached subjects.

Recent psychoanalytic research has expanded on the concept of ego defense through an investigation of the IWM. According to Fonagy et al. (2002), the IWM is a set of emotional, behavioural, and cognitive processes evoked in the service of affective self regulation, rather than a content-based script about a given relationship or person. Thus, the IWM is actually a state of mind regarding interpersonal relationships, or an overall psychological approach that is evoked when negotiating interpersonal stressors. In addition, the level of security in early infant-caregiver relationships mediates the acquisition of an intentional stance, in other words to playfully explore the mind of others and of oneself (Fonagy et al., 2007; 2008). The concept of mentalization (Fonagy et al., 2002) conceives of early attachment relationships as training grounds to develop an integrated mode of reflective functioning. Securely attached individuals need fewer calls to activate the IWM (it is less likely for it to be 'turned on') and thus by avoiding attachment related cumulative hyper-arousal tend to demonstrate a precocious and more flexible interpretative interpersonal function.

Fonagy has suggested reciprocal characteristics of the two systems, i.e. activation of the attachment system causing the deactivation of the mentalization/social judgement network. Results of functional neuroimaging studies have shown striking similarities in neural structures when maternal and romantic love were the focus of investigation leading to a decoupling mechanism of common brain regions (Bartels and Zeki, 2004). The overlapping set of deactivations elicited by maternal and romantic love includes areas that are theorized to comprise the social cognition/ theory of mind network or in other words when subjects adopt an "intentional stance" or a mentalizing activity. However, this can be seen critically as a too simplistic approach that does not address the IWM of attachment.

Measures/Subjects:

40 healthy Yale undergraduate students will be assessed with equal gender distribution. Past or present psychopathology will entail exclusion from the study.

The general experimental paradigm consists of a pre-post assessment of subjects’ performance in a mentalization test (an extended version of Baron-Cohen’s Reading the Mind in the Eyes Test). Inbetween assessments, an idiosyncratic stress induction (based on Sinha et al.’s stress induction) is hypothesized to serve as an activator of the participants’ attachment system.
**Measures across all subjects:** Object Relations Inventory, ORI (Blatt et al., 1996)
Differentiation-Relatedness-Scale, D-R-S (Diamond et al., 1991)
Reflective Functioning Questionnaire (under development, Fonagy et al.)

*attachment:* Experience in Close Relationships revised, ECR-R (Fraley et al., 2000)

**mentalandization task:** Reading the Mind in the Eyes Test (revised version) (Baron-Cohen et al.)
*Psychophysiological:* saliva cortisol, heart rate, blood pressure to obtain objective data on subjects’ stress reaction

**General Study Design:**

In this exploratory phase the impact of attachment activation on mentalization is investigated in a EEG-ERP setting to draw conclusions about the temporal character of underlying neural processes and to obtain preliminary data with respect to the localization of involved brain regions.

Subjects will be asked to decode others’ mental states on the basis of facial expressions. We extended the Reading the Mind in the Eyes Test by adding additional trials.

**Schematic representation of a single trial**

Findings from Sabbagh et al. (2004) should be replicated with an N270-400 component over inferior frontal and anterior temporal regions (on the right hemisphere) being associated with those processes. Previous source estimations suggested orbitofrontal and medial temporal regions to underly this ERP effect.
ERP aspects distinguishing mental state from sex decoding* taken from Sabbagh et al., 2004.
Hypotheses:

A. Subjects’ Reflective Function Questionnaire scores will correlate at least moderately with their score of accuracy from the Reading the Mind in the Eyes Test.

B. Because of more defensive and less effective processing of attachment related stress (hyperarousal) individuals with an insecure/disorganized IWM (assessed via self-reported scores of attachment anxiety and avoidance of the ECR-R) will be less accurate on the mentalization task after attachment induction. For ERP-EEG we would expect the early ERP components (P1, N170) to be modulated by attachment related arousal. Further we anticipate differential amplitude measures at the Late Positive Potential (LPP) component as the LPP is associated with the motivational relevance of visually presented stimuli.

C. Individuals with an insecure IWM will be less able to regulate attachment related separation distress and therefore the activation of their involved neural circuitry will be higher compared to securely attached subjects. This should be paralleled by increased levels on psychophysiological stress measures.

D. Psychodynamic measures (ORI, Blatt et al., 1996 and D-R-Scale, Diamond et al., 1991) will be used exploratorily to assess internal representations of self and others with respect to social cognition.

Discussion:

Should the hypotheses be confirmed we hope to provide some evidence for the clinical observation of attachment-mediated shutting down effects on mentalization. We also hope that having successfully operationalized this phenomenon in a controlled experimental design we can then transform our research into an fMRI setting. This will be accompanied by a refinement of measures capturing psychodynamic conceptualizations of attachment and mentalization more reliably, i.e. use of the Adult Attachment Interview (Main et al.) and an adult version of the Mentalization Stories Test for Adolescents, (Vrouva & Fonagy). The next step would be to reassess a subsample with these measures in order to later serve as healthy controls in a study of Borderline Personality Disorder. Results from exploring the attachment-mentalization interplay in patients with mainly disorganized attachment representations could then be contrasted with this control group using the same paradigm.