Acknowledgments

- **UCL/AFC**
  - Prof George Gergely
  - Dr Pasco Fearon
  - Dr Mary Target
  - Prof Anthony Bateman

- **Department of Psychology University of Leuven**
  - Dr Patrick Luyten
Acknowledgments

**Menninger Clinic/Baylor Medical College**
- Dr Jon Allen
- Dr Lane Strathearn
- Dr Brooks King-Casas
- Dr Read Montague
- Dr Carla Sharp
- Dr Efrain Bleiberg

**Yale Child Study Centre**
- Prof Linda Mayes

And Dr Liz Allison, Rose Palmer and Fran Fonagy for help with the preparation of this presentation.
Sroufe and colleagues (Sroufe et al., 2005) conclude “*nothing is more important in children’s development than how they are treated by their parents, beginning in the early years of life*” (p. 288).
Coan (2008) “One of the striking things about humans (and many other mammals) is how well designed we are for affiliation” (p. 247)… “the brain’s first and most powerful approach to affect regulation is via social proximity and interaction. This is most obvious in infancy….. (p. 255)

Coan (2008) “One of the striking things about humans (and many other mammals) is how well designed we are for affiliation” (p. 247, emphasis in original). More specifically, the attachment system is “primarily concerned with the social regulation of emotion responding” (p. 251).

The brain’s first and most powerful approach to affect regulation is via social proximity and interaction. This is most obvious in infancy…. Because the PFC [prefrontal cortex] is underdeveloped in infancy, the caregiver effectively serves as a kind of ‘surrogate PFC’—a function that attachment figures probably continue to serve for each other to varying degrees throughout life. (p. 255)

Social affect regulation is a relatively effortless, “bottom-up” process that ameliorates the initial perception of threat and thus decreases the need for effortful distress regulation.

In contrast, self-regulating by a relatively “top-down” process involves more effortful control over attention and cognition (i.e., explicit mentalizing), relying to a greater degree on the prefrontal cortex. He concludes,

“Simply put, affect regulation is possible, but more difficult, in isolation” (Coan, 2008, p. 256).
<table>
<thead>
<tr>
<th>Clinical Features of Borderline Personality Disorder (DSM-IV: 5 of 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>unstable relationships</td>
</tr>
<tr>
<td>affective dysregulation</td>
</tr>
<tr>
<td>impulsivity</td>
</tr>
<tr>
<td>aggression</td>
</tr>
</tbody>
</table>
Is Personality Not Just Genetics Anyway?

- Studies of psychiatric patients show BPD is familial

- Studies of twin samples show it is heritable.

- Non twin family studies ➔ increased rates of BPD in family members of BPD patients
- Classical twin studies ➔ heritability estimates of around 40%
- Adding siblings, spouses and parents of twins
But do we not know that bad things happen in the lives of these patients?

- **Retrospective** studies link harsh treatment early in life with later BPD.

- Largely confirmed by **prospective** studies
BPD and childhood maltreatment: recent prospective studies

- **Johnson and colleagues** (Johnson et al., 2006) assessments of family members and their offspring spanning age 6 to 33
  - low levels of parental affection and nurturing
  - aversive parental behaviors such as harsh punishment
  - BUT: not specific to BPD

- **Lyons-Ruth and colleagues** (Lyons-Ruth, Yellin, Melnick, & Atwood, 2005; Melnick et al., 2008)
  - disrupted maternal communication in infancy predicts symptoms of borderline pathology assessed at age 18
  - total amount of abuse over the lifetime reported in adolescence also contributes
  - disrupted maternal communication and later abuse make independent and additive contributions to pathology associated with borderline personality disorder.
Early maternal separation and trajectory of borderline personality disorder symptoms

Crawford et al. 2010
Dev. & Psychopath.
BPD and Minnesota longitudinal study
(Carlson, Egeland, & Sroufe, 2009)

- Correlated extensive assessments from infancy onward with borderline personality disorder symptom at age 28
- Early predictors borderline personality symptoms:
  - attachment disorganization .20*
    - o (12-18 months),
  - maltreatment .20**
    - o (12-18 months),
  - maternal hostility and boundary dissolution .42***
    - o (42 months),
  - family disruption related to father presence .21**
    - o (12-64 months),
  - family life stress .29***
    - o (3-42 months).
BPD and Minnesota longitudinal study
(Carlson, Egeland, & Sroufe, 2009)

- Early adolescent predictors (12 years)
  - attentional disturbance,
  - emotional instability,
  - behavioral instability, and
  - relational disturbance.

- Disturbances in self-representation in early adolescence may mediate the link between attachment disorganization and personality disorder.
Mediating Role of Self-Representation (Carlson et al., 2009)

- narrative projective tasks administered at age 12 that included:
  - intrusive violence related to the self,
  - unresolved feelings of guilt or fear,
  - bizarre images related to the self.

- Carlson et al. (2009): “representations and related mentalizing processes are viewed as the carriers of experience that link early attachment to later Psychopathology” (p. 1328).

Diagram:
- Abuse Composite
  - 1.40**
  - 0.09(1.04**)
  - Attachment disorganization
  - 0.08*
  - Composite self-index
  - 1.04**
  - Borderline symptoms

Sobel Test: z=2.23, p<.01
Diathesis-stress theories of BPD etiology

Theories suggesting an interaction between a child’s genetic vulnerability and adverse experiences in the family environment

Diathesis-stress theories of BPD etiology

- Need to directly evaluate the diathesis-stress model by testing for interaction between inherited risk and harsh childhood treatment.

  - **Prospective longitudinal design** with three things measured
    - familial liability
    - harsh treatment during childhood
    - early-emerging symptoms of borderline personality soon thereafter.
A Test of Diathesis-Stress Theories of the Etiology of Borderline Personality Disorder in a Birth Cohort of 12 Year Old Children

- **Objective.** To test if children with a **positive family history** of psychiatric disorder were more **vulnerable** to developing borderline personality symptoms following **exposure to physical maltreatment** and maternal negative expressed emotion.

- **Design.** Prospective **longitudinal** cohort study of a nationally representative **birth cohort** in Great Britain.

- **Participants.** 1,116 families with **twins** were followed from birth to age 12 years (retention 96%).

- **Main Outcome Measure.** **Dimensional** borderline personality symptoms and **dichotomous** extreme borderline group membership (dimensional symptoms ≥95th percentile).

Belsky, Caspi, Arseneault, Bleidorn, Fonagy, Goodman, Houts, and Moffitt (submitted)
Some possible attachment related components of the BPD phenomenological phenotype

- Affect Regulation
- Attention Control
- Mentalization
- Disorganization of the Self
- BPD
What is mentalizing?

Mentalizing is a form of *imaginative* mental activity about *others* or *oneself*, namely, perceiving and interpreting *human* behaviour in terms of *intentional* mental states (e.g. needs, desires, feelings, beliefs, goals, purposes, and reasons).
What is mentalization?

- It is a capacity we use all the time
- It is what we need:
  - To collaborate
  - To compete
  - To understand feelings
  - To teach
  - To learn
  - To know who we are
  - To know that we are
- Our awareness of mental states makes us laugh and cry

It is a capacity we use all the time
It is what we need TO EFFECTIVELY:
  - To collaborate &
  - To compete
  - To teach &
  - To learn
  - To know who we are &
  - To know that we are

Our awareness of mental states makes us laugh and cry
Forewarning – 1.

In advocating mentalization-based treatment we claim no innovation. On the contrary, mentalization-based treatment is the least novel therapeutic approach imaginable: it addresses the bedrock human capacity to apprehend mind as such. Holding mind in mind is as ancient as human relatedness and self-awareness.

Mentalization and Overlapping Constructs (Choi-Kain & Gunderson, Am J Psychiat 2008)

This Venn diagram maps the conceptual overlaps between mentalization and four related concepts including mindfulness, psychological mindedness, empathy, and affect consciousness, which are represented by the four circles. The lines which bifurcate the diagram according to its three dimensions (i.e., self-/other-oriented, implicit/explicit, and cognitive/affective) are dashed to illustrate the permeable and nonabsolute nature of these divisions. In the self/other dimension, mindfulness focuses more on mental states within oneself, while empathy is primarily understood in terms of one's imagination of mental states within others. Both affect consciousness and psychological mindedness concern both sides of the self and other distinction. While mindfulness and psychological mindedness emphasize both cognitive and affective aspects of mental states and function explicitly, affect consciousness and empathy relate more primarily to affective mental contents and function both explicitly and implicitly. Mentalization lies at the intersection of these concepts but the boundaries between them are not distinctly drawn.
Forewarning – 2.

This product may contain traces of originality. These are only trace contaminants, occurring as part of the production process, and should not spoil your enjoyment of the product.
Measuring Mentalization (Baron-Cohen et al., 2001) Reading the Mind in the Eyes Test

| Friendly - A | Surprised - C | Sad - B | Worried - D |
Measuring Mentalization (Baron-Cohen et al., 2001) Reading the Mind in the Eyes Test

Surprised-A

Sure about something-B

Joking-C

Happy-D
Measuring Mentalization (Baron-Cohen et al., 2001) Reading the Mind in the Eyes Test

Joking-A

Desire-C

Flustered-B

Convinced-D
Mentalizing at the World Cup: How does Robert Green feel after letting in the USA goal?

Mentalization allows us to have common experiences – we need to coordinate our emotional experiences to function in large social groups. Imagine what would happen if we all felt differently about Lampard’s disallowed goal! Fortunately not the case.
Have to be able to step into the shoes of another person -
CAN DEVELOPMENTAL PSYCHOLOGY RESEARCH HELP US GET CLOSER TO THE POTENTIAL SOCIAL EXPERIENCES THAT COULD SET OF THE EPIGENETIC CASCADE THAT Dr Moshe Szyf was describing to us yesterday?

INTERSUBJECTIVE ORIGINS OF THE SELF
Relational Aspects of Mentalization

- Overlap between neural locations of mentalizing self and other may be linked to **intersubjective origin of sense of self**
  - We find our mind initially in the minds of our parents and later other attachment figures thinking about us
  - The parent’s capacity to **mirror effectively** her child’s internal state is at the heart of affect regulation
  - Infant is **dependent on contingent response** of caregiver which in turn depends on her capacity to be reflective about her child as a psychological being

JUST HOW IMPORTANT CONTINGENT RESPONDING TO AFFECT IS WE KNOW FROM STILL FACE PARADIGM (GERGELY)
High congruent & marked mirroring

Shows the infant ABSOLUTELY EXPECT TO FIND HIS MIND OUT THERE, IS IN NO SENSE PROVIDED WITH A MIND BY THE CAREGIVER BUT HE SEARCHES OUT, SEEKS OUT OPPORTUNITIES FOR SHARING OF SUBJECTIVITY BECAUSE OF EXTREMELY POWERFUL BIOLOGICAL PREDISPOSITION. SO IN MIRRORING BUT MIRRORING MUST BE OF A SPECIAL KIND – NOT LIKE A REAL MIRROR
Mirroring must not be too accurate, it must be ‘marked’ (systematically distorted) so child knows he is not observing caregiver’s dispositional state.

IN SEVERAL STUDIES WITH Kos and Gergely WE HAVE SHOWN MARKED MIRRORING to LEAD TO MORE ROBUST MENTALIZATION.
The Role of Attachment in Humans

- Evolution uses the early attachment relationship as a **signaling system** to the newborn as to the kind of environment he/she might expect.
  - An environment where caregivers do not have the time or resources to devote attention to the infant is far more likely to necessitate the later use of violence in order to ensure the survival of the individual in subsequent struggles for limited resources.
  - Violence and mentalizing are not compatible
Security of attachment and mentalizing are intertwined in an intergenerational transmission process

- For better
  - parental security ➔ mentalizing capacity ➔ mentalizing interactions ➔ child security

- For worse
  - parental insecurity ➔ compromised mentalizing capacity ➔ non-mentalizing-traumatizing interactions ➔ child insecurity

- The final link
  - infant attachment security ➔ subsequent child mentalizing capacity
Secure attachment is facilitative of mentalizing

- Children **pass theory of mind** tasks earlier if
  - Had **secure** attachment relations with parents in infancy
  - If **parent**'s own state of mind in relation to attachment was **secure**
  - Family members relate to each other in playful, mentalizing way
- Mechanism may well be mediated by oxytocin

Oxytocin is the VIAGRA of mentalization
Oxytocin and performance on Mind in the Eves test (Domes et al., 2008)

### Around in great quantity (breast feeding) when the infant needs it most – when it totally depends on being understood

Oxytocin turns us towards the face to try to find the mind therein
Gaze duration during oxytocin exposure

Guastella, Mitchell, Dadds, 2008

Is there less oxytocin around when parents have insecure attachment history?
A provisional model of the developmental roots of mentalization

- Secure maternal attachment
- Increased maternal OXT while with infant
- More mentalizing (marked – contingent) response to infant distress
- Infant generates a 2nd order representation of self state
- Improved affect regulation enhances interpersonal interactions
- Facilitative impact of social interaction on development of improved mentalization ➔ resilience
A provisional model of roots of disorganized mentalization

Need Oxy not to undermine natural process of the unfolding of mentalization (infants expect to find the contents of their mind) they look for it

It has developmental roots in genetic or social or epigenetic diathesis that undermines the creation of robust social relationships that might help the child overcome an early deficit
Do patients with BPD have anything wrong with their mentalizing?

$20 \rightarrow \text{Subject 1} \quad \text{healthy investor}

\text{x3} \quad \text{Subject 2} \quad \text{BPD trustee}
Average Repayment:

- repay everything
- repay investment (33%)
- repay nothing

*King-Casas et al, in Science, 321, 806-810
**Investor Sent**  
MU sent / MU available  
44 non-psychiatric investors  
55 non-psychiatric investors

**Trustee Repaid**  
MU sent / MU available  
44 non-psychiatric trustees  
55 BPD trustees

*King-Casas et al, in Science, 321, 806-810
Specific to social-decision making, not non-social decision-making
Specific to BPD, not mood disorder

The figure shows the amount of monetary units invested by the participants from the three experimental groups. It is apparent that, in contrast to healthy controls and patients with depression, patients with borderline personality disorder invested less money during the first transactions of the trust game (modified from ref. [18]).

Unoka, Seres, Aspán, Bíódi, Kéri (2009)
Do BPD patients have anything wrong with their mentalizing?

- Most likely to happen in interpersonal context when they misunderstand and feel misunderstood by someone they care about
- The non-mentalizing viscous cycle
Cycles of inhibition of mentalizing

- Powerful emotion
- Frightening, undermining, frustrating, distressing or coercive interactions
- Poor mentalising
- Inability to understand or even pay attention to feelings of others
- Loss of certainty that thoughts are not real
- Try to control or change others
- Others seem incomprehensible
- Loss of certainty that thoughts are not real
Vicious Cycles of Mentalizing Problems within a Relationship

Powerful emotions in an interpersonal context activate the attachment system
Is there a human language which does not recognize love to be blind?

Common regions of deactivation with maternal and romantic love (Bartels & Zeki, 2008)

**Fig. 2.** Deactivated regions with maternal and romantic love. The sections and rendered views show regions whose activity was suppressed with maternal love (cO vs. cA) (top). These regions were the same as those that were deactivated with romantic love (viewing loved partner vs. friends) in our previous study (bottom). All labelled regions reached significance at P < 0.05, corrected for small volume (for illustration, following thresholds were used—top: P < 0.05, uncorrected; bottom: P < 0.001, uncorrected). Abbreviations: A = amygdaloid cortex, pc = posterior cingulate cortex, mp = medial prefrontal/paracingulate gyrus; mt = middle temporal cortex; op = occipitoparietal junction; tp = temporal pole.

Two areas:
- middle prefrontal, inferior parietal and middle temporal cortices mainly in the right hemisphere, as well as the posterior cingulate cortex ➔ attention, long-term memory, variable involvement in both positive negative emotions ➔ underpin interface of mood related cognition
- amygdala, temporal poles, parietotemporal junction and mesial prefrontal cortex ➔ social trustworthiness, moral judgements, ‘theory of mind’ tasks, negative emotions, attentions

**BUT IS IT JUST AROUSAL OR IS IT SPECIFICT TO ATTACHMENT?**
The effect of attachment-related stress on the capacity to mentalize: Induction imagery scripts to participants (Nolte, Hudac, Mayes, Fonagy & Pelphrey, 2009)

- Scripts obtained in a visit prior to scanning with the aim to create stress-related arousal states
- Idiosyncratic content, personally meaningful
  - Common themes attachment stress: e.g. relationship breakup, funeral etc.
  - Common themes normal stress: e.g. exam preparation, lost objects etc.

Scripts obtained in a visit prior to scanning with the aim to create stress-related arousal states

Idiosyncratic content, personally meaningful
Common themes attachment stress: e.g. relationship breakup, funeral etc
Common themes normal stress: e.g. exam preparation, lost objects etc.
Edited, recorded, semi-standardized about 5 mins. of length each
Only scripts that were subjectively rated 8 or above on a 1-10 scale of subjective stress accepted.
No differences in subjective level of stress ratings between ‘attachment’ and ‘normal’ stress
### Stimuli

<table>
<thead>
<tr>
<th>Which attitude?</th>
<th>Which age?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resentful</td>
<td>Twenty-three</td>
</tr>
<tr>
<td>Bored</td>
<td>Thirty</td>
</tr>
</tbody>
</table>

Subjects were asked to make a judgment as fast and accurately as possible.

Examples of single trial stimuli, RMET (top), control task (bottom).
Attachment stress selectively disrupts mentalization performance
Nolte, Hudac, Mayes, Fonagy & Pelphrey (2009)

Attachment stress disrupts RMET performance more than normal stress!
Disruption in Mz performance associated with decreased activation of perspective taking regions

Identified brain regions that show greater activation during the Reading the Mind in the Eyes Test (highlighted) and control task, see table. Below: Activation maps of the regions with greater activity during the REMT task. Left inferior frontal gyrus, posterior superior temporal sulcus and temporal parietal junction are areas that have repeatedly been associated with mentalization/social cognition tasks (5), (6).
The ‘hyperactivation’ of the attachment system

Hyperactivation of attachment system may be core aspect of BPD
The hyper-reactivity of the attachment system in BPD

- We assume that the attachment system in BPD is “hypersensitive” (triggered too readily)
- Indications of attachment hyperactivity in core symptoms of BPD
  - Frantic efforts to avoid abandonment
  - Pattern of unstable and intense interpersonal relationships
  - Rapidly escalating tempo moving from acquaintance to great intimacy
Response to partner’s hypothetical cooperation in Assurances Game

Group x Oxytocin: F(1, 23)=4.82, p < .05 (Bartz et al, in prep)

**Participants:** 13 healthy (male=7) and 14 BPD (male=4);

**Study design:** Participants randomly received 40 IU intranasal oxytocin (n=14) (Syntocinon) or placebo (n=13);

45-min after administration, participants played the Assurances Game with an ostensible partner (confederate);

Baseline and post-dose mood assessed with the POMS; no mood changes observed.

Prisoner’s dilemma emphasizes self-interest (payoff is greater for defecting)

AG emphasizes trust:

- locates the selfish and interpersonal solution in the same, mutual cooperation cell (i.e., payoff is highest for both players when they cooperate)

However, one should only cooperate if one is assured that one’s partner will do the same; if partner’s are mistrustful, they should pursue mutual defection, which is sub-optimal (i.e., the payoff is less than it would be if your partner cooperated, but the more than it would be if your partner defects)
Romantic relationships and BPD

Pictures (romantic partner, stranger, acquaintance) were shown for 15 seconds in 9 random permutations of the 3 types.

• Ongoing study with Carla Sharp at Menninger
The simple idea behind MBT

- Failure of mentalization in attachment associated contexts is key aspect of BPD psychopathology
- An individual with BPD is vulnerable to the **collapse of subjectivity** associated with
  - intolerable mental pain
  - amplified experience of negative emotions
  - cognitive dyscontrol
- A psychotherapeutic approach focusing on sensitively and **gently expanding and clarifying** the patient’s representations of mental states serves to reduce impulsivity and improves sense of subjective well-being.

How do you do that – is there a technique. PERHAPS THERE ARE SOME OF YOU THERE WHO HAVE NO IDEA WHAT WE ACTUALLY DO IN MBT?
The MBT technique

- Simple **sound-bite** interventions
- **Affect focused** (love, desire, hurt, catastrophe, excitement)
- Focus on patients **mind** (not on behaviour)
- Relate to **current** event or activity – mental reality (evidence based or in working memory)
- Use of **therapist’s mind** as model (disclosure)
- **Identify non-mentalizing** and recover it on the many occasions when apparently lost
Clinical summary of intervention

- Focus is on a break in mentalizing – psychic equivalence, pretend, teleological
- **Rewind** to moment before the break in subjective continuity
- Explore current **emotional context** in session by identifying the momentary affective state between patient and therapist
- Identify **therapist’s contribution** to the break in mentalizing (humility)
- Seek to **mentalize** the therapeutic **relationship** but only very slowly and carefully

Psychic equivalence:
- Mind-world isomorphism; mental reality = outer reality; internal has power of external ➔ Fran
- Intolerance of alternative perspectives ➔ ”YOU LOOKED AT YOUR WATCH”

Pretend mode:
- Ideas form no bridge between inner and outer reality; mental world decoupled from external reality ➔ FRAN
- “dissociation” of thought, hyper-mentalizing or pseudo-mentalizing ➔ ENDLESS HOURS OF ‘THERAPY’

Teleological stance:
- A focus on understanding actions in terms of their physical as opposed to mental constraints
- Cannot accept anything other than a modification in the realm of the physical as a true index of the intentions of the other.

WHAT ARE THE THERAPISTS AIMS?
So what should the therapist aim do?

- Care taken **not to assume** the presence of social cognitive capacities that cannot be relied on
- **Empathy** with experience of disrupted subjectivity
  - Psychic equivalence ➔ ego-destructive shame
  - Pretend mode ➔ sense of disintegration
  - Teleological mode ➔ the urgency to cause observable change
- Constant awareness of the potential for iatrogenic **harm**
  - Over-activating the attachment system ➔ reduces the capacity for mentalization
So what should the therapist aim to do?

- Help the patient learn about the complexities of his thoughts and feelings about himself and others, how that relates to his responses, and how ‘errors’ in understanding himself and others lead to actions.

- It is not for the therapist to ‘tell’ the patient about:
  - how he feels,
  - what he thinks,
  - how he should behave,
  - what the underlying reasons are, conscious or unconscious, for his difficulties.

- An inquisitive or ‘not-knowing’ stance. Conveys a sense that mental states are opaque.

Fairly generic formulation before you try to do it. At its heart is the idea that patient will get better if therapists makes mind available for patient to find their own capacity to think – much like with early development – INFANT’S SEEKING OF SUBJECTIVITY CAN BE UNDERMINED
Psychotherapy for BPD

A range of structured treatment programmes for BPD shown to be effective in studies
- DBT
- TFP
- SFT
- DDP
- CAT
- MBT

Do they work for the reasons the developers suggest?
Are the demonstrations of effectiveness compelling in terms of
- Statistical power
- Long term follow up
- Generalizability (treatments tested are mostly cost specialist interventions requiring extensive training
- Meaningful comparison group

ONE MAY BE FORGIVEN FOR CONTEMPLATING IF ANY Treatment WITH A 3 LETTER ACRONYM HAS A CHANCE OF IMPROVING THE WELLBEING OF INDIVIDUALS WITH BPD

All provide structure – Perhaps it is the structure that is crucial because allows people to think. If we just provide a structure that tells therapists what to do will we remove the effective component.
Meaningful trial IDEALLY should provide a:

- comparison group receiving a **structured (manualized)** treatment organised in a coherent treatment programme with equivalent supervision
- delivery of both treatments by professionals **trained from the same level to the same level** over the same period
- adequate **statistical power** to detect relatively small differences
- **representative sample** of clinically referred men and women with confirmed diagnosis of BPD and at high risk of suicide