MST in the Context of Evidence Based Treatments of Conduct Disorder

Peter Fonagy  FMedSci FBE OBE
Chief Investigator, **START Trial**, UCL
With the support of **Dr Stephen Butler** and **Ms Rachel Ellison** (nee Haley)

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Plan of the presentation

• Apology and a thank you
• Brief overview of CD
• Overview of evidence base of CD in adolescence
• Current status of MST in the context of alternative interventions
• Outline of the START trial
• Tentative theoretical frame as per RDoC

Slides available from: P.Fonagy@UCL.AC.UK
The Ability to Change Brains Decreases Over Time

Normal Brain Plasticity Influenced by Experience

Physiological “Effort” Required to Enhance Neural Connections

Birth 10 20 30 40 50 60 70

The CYP IAPT Project

- Transforming the way care is delivered moving towards **scientifically** founded mental health care delivery service
- Improving access to **evidence-based** therapies
- Using routine **outcomes** monitoring
  - To guide **therapist** and supervisor
  - To help **client** understand how treatment is progressing
- **Empowering** service users to take control of their care, establish treatment **goals**, choose treatment approaches and take opportunities to improve their **own health**
CYP-IAPT: Training in evidence based practice

Research evidence + Patient preferences and values + Clinician observations = Quantifiable results
Utility for clinicians Acceptable to recipients

Frueh et al (2012) Evidence-Based Practice in Adult Mental Health. Handbook of Evidence-Based Practice in Clinical Psychology. Published online.
Disturbances of conduct in Children

- Characterised by high rates of noncompliant, hostile and defiant behaviours
  - Often including aggressiveness and hyperactivity

- Three broad diagnoses (DSM-V, 2013)
  - Oppositional Defiant Disorder (ODD)
  - Conduct Disorder (CD)
  - Antisocial Personality Disorder (ASPD)
  - Unspecified disruptive behaviors (pyromenia, kleptomania)

- ODD and CD diagnoses overlap, but CD entails violation of other’s rights and social rules
  - Aggressiveness to people and animals.
  - Property destruction
  - Deceptiveness or theft
  - Serious rule violations

- These behaviours are embedded in the individual’s social context and have consequences
  - For the family
  - For potential victims
  - For the individual him/herself (Moffit & Scott, 2008)
Conduct disorders: Onset age and outcome

**Childhood-onset type**
- Appears before age of 10
- Poorer outcomes in most domains of life
  
  Moffit & Caspi, 2005; Moffitt, 2006

** Adolescent-onset type**
- No disruptive behaviour before age 10
- Better outcomes in adult life, but not exempt of problems
  
  Odgers et al, 2007

**Childhood-limited CD**
- Do not become antisocial adults
- They often become depressed, socially isolated and financially dependent adults
  
  Wiesner, Kim & Capaldi, 2005

Early disruptive behaviour problems tend to improve without assistance over the first 10 years of life

Tremblay et al., 2004
Conduct disorders and psychopathy

In spite of their similar definition, CDs do **not necessarily progress** into Antisocial Personality Disorder (**ASPD**).

One subgroup of conduct disordered youth are in higher risk of **persistent** and **treatment-resistant** antisocial and offending behaviour.

- Lack of **guilt**
- Lack of **empathy**
- **Callow** use of others
- More conduct problems
- More severe aggression
- More proactive aggression

**Differences with other CD children**
- **Brain** structure
  - Decreased white matter concentration
  - Differences in gray matter concentration
- **Brain** function
  - Reduced amygdala response to fearful faces
- **Genetic**
  - The most **heritable** mental disorder
- **Developmental**
  - Earlier onset

This subgroup has a biological aetiology and respond poorly to typical treatments.
Conduct Disorders: Prevalence

They are the most common mental health disorders in children and adolescents.

**ODD:**
- 2.6% - 15.6% in the community
- 28% - 65% in clinical populations

**CD:**
- 1.8% - 16% boys
- 0.8% - 9.2% girls

Those on lower socioeconomic classes are four times more likely to have a CD.

Public expenditure on youths with CD is substantially higher.

CD costs approx. $7,000 in increased professional mental health and general health service use across childhood alone.

Adolescent-onset is higher than childhood-onset: 24% vs. 7%.

Adolescent conduct problems have increased over the last 30 years.

Gender differences have narrowed in recent years.

NICE, 2011; 2013; Boylan et al., 2007; Loeber et al., 2000; Foster & Jones, 2005; Scott et al., 2001; Collishaw et al., 2004; Moffitt et al, 1996; Tracy, Kempf-Leonard & Abramske-James, 2009.
Impact of mental disorder during childhood and adolescence

Higher rates of self-harm, health risk, and antisocial behaviour (11-16 year-olds)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Emotional disorder</th>
<th>Conduct disorder</th>
<th>Hyperkinetic disorder</th>
<th>Whole survey prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular <strong>smoker</strong></td>
<td>19%</td>
<td>30%</td>
<td>15%</td>
<td>6%</td>
</tr>
<tr>
<td>Regular <strong>drinker</strong></td>
<td>13%</td>
<td>19%</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Drinks twice a week or more</td>
<td>5%</td>
<td>12%</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Taken <strong>drugs</strong> at some time</td>
<td>20%</td>
<td>28%</td>
<td>23%</td>
<td>8%</td>
</tr>
<tr>
<td>Taken drugs, mainly cannabis</td>
<td>16%</td>
<td>23%</td>
<td>18%</td>
<td>7%</td>
</tr>
<tr>
<td>Taken drugs other than cannabis</td>
<td>7%</td>
<td>16%</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Self-reported <strong>self-harm</strong></td>
<td>28%</td>
<td>24%</td>
<td>18%</td>
<td>7%</td>
</tr>
</tbody>
</table>

43% of smokers aged 11-16 have either emotional or conduct disorder

*Children with conduct disorders thereby constitute a significant proportion of population health risk behaviour*

Campion, 2013. From Green et al, 2005
Impact of mental disorder in adulthood: Conduct problems

- **Higher rates of antismial behaviour, offending and violence** (SCMH, 2009)
  - Nearly half of children with early-onset conduct problems have persistent and serious problems including crime and violence (Fergusson et al., 2005)

- **Unemployment and lower earnings** (Fergusson et al., 2005)

- **Higher risk of adult mental disorder**
  - **Psychosis**: schizophrenia and mania (NICE, 2006)
  - **Common mental disorder**: depression, anxiety, OCD, panic disorder (Fergusson et al., 2005; NICE, 2006; Colman et al, 2009)
  - **Substance misuse** (Fergusson et al., 2005)
  - **Suicidal behaviour** (Fergusson et al., 2005; Odgers et al., 2007)
  - **Personality disorder**: e.g., 40-70% children with CD will develop ASPD as adults (NICE, 2009)
The book that has it all!!

- ANXIETY DISORDERS
- DEPRESSIVE DISORDERS
- DISTURBANCE OF CONDUCT IN CHILDREN
- DISTURBANCE OF CONDUCT IN ADOLESCENTS
- ATTENTION DEFICIT HYPERACTIVITY DISORDER
- TOURETTE SYNDROME
- PSYCHOTIC DISORDERS
- PERVERSIVE DEVELOPMENTAL DISORDERS
- SELF-INJURIOUS BEHAVIOR
- EATING DISORDERS
- SUBSTANCE USE DISORDERS
- CHILDREN WITH PHYSICAL SYMPTOMS
- SPECIFIC DEVELOPMENTAL DISORDERS
- CHILD MALTREATMENT
- SUMMARY OF FINDINGS AND DISCUSSION
- 4,460 References
Psychosocial interventions for CD in adolescents

• Numerous meta-analyses of psychosocial treatments produced consistent findings:
  – **27 meta-analytic reviews** covering nearly 2,000 studies:
    • ESs small to medium: $d = 0.43$ [0.38-0.45]
  – **Methodological issues** of effectiveness research seem to account for more variance than type of treatment
  – Many different interventions show **good ESs**.
  – Best results in meta-analysis are associated with **treatment fidelity**
    • Effectiveness is improved when there is a **good implementation** and targeting of **high-risk adolescents**
  – Demographic characteristic of YP are unrelated to outcome, but the **best results** are obtained by **older higher risk juveniles** (with more prior offenses)

Fonagy et al. (in press)
Conduct disturbances in adolescents: Meta-analytic findings

- There are numerous meta-analyses with consistent findings
- Effect sizes are in general small to medium (d= 0.38 - 0.45; mean 0.43)


**The need principle**
- Target **criminogenic needs** e.g.:
  - Promotion of **family affection** and communication
  - Family **monitoring** and supervision of the adolescent

**The responsivity principle**
- **Tailoring** the intervention to the individual
  - Highest ESs derive from behavioural, skills-oriented and multimodal methods from **social learning theory** and cognitive behavioural principles

**The risk principle**
- Higher effects are found in **higher risk offenders**
  - More need for treatment and more room for improvement
Adolescent-oriented therapies (CBT)

- **Training in moral reasoning** (strong evidence)
  - Used by correctional agencies in many countries
  - Adolescents seem unaffected by intervention (r=0.13 overall with offenders r=0.07)

Innovative approaches that reformulate CBT (e.g. DBT, MBCT)
Limited but promising evidence
Innovative approaches: Mindfulness-based interventions

Mindfulness-based cognitive therapy (MBCT)
- **Insufficient evidence** shows:
  - Good attendance
  - **Self-reported improvements** in behaviour, goals, subjective happiness and mindful awareness
  - Improvements in parent-reported variables
  
  *Bogels, Hoogstad, van Dun, de Schutter & Restifo, 2008*

Mindfulness-based stress reduction (MBSR)
- Originally devised as an intervention for anxiety/chronic depression
- **Promising** as an **adjunct** to mainstream CBT
- **Insufficient evidence** shows significant positive changes after an 8-week intervention, maintained at follow-up.

  *Biegel, Brown, Shaopiro & Schubert, 2009*

Dialectic Behaviour Therapy (DBT)
- Scarce evidence shows:
  - **14% reduction** in recidivism
  - Significant **decrease** in behaviour problems for **females**
  - **Suicidal** acts, aggressive behaviour and class disruptions were **not reduced**

  *Drake & Barnoski (2006)*

Mode Deactivation Therapy (MDT)
- A questionable “meta-analysis” claims large ESs ($d=1.1 - 1.8$)

  *Apsche, Bass & DiMeo, 2011*
School- and community-based approaches

- **Family Check-Up** (strong evidence)
  - A modification of the Oregon Model
  - Integrates family and school
  - Maintenance model: regular check-ups
  - Modification of motivational interviewing techniques
  - Self-selection of interventions
  - Reduces re-arrest rates by 85% to 15% amongst ‘engagers’

have largest effects (d=0.29)

- Limited evidence for the effectiveness of wraparound services
Family interventions

- **Strong evidence** from large sample RCTs:
  - Family-based interventions *need high levels of fidelity* to achieve outcomes
  - Even the most effective intervention *leaves 50%* or more of the youth treated *with significant clinical problems*

- These interventions *share various strengths*
  - Investment in special *protocol to engage* with families
  - Considerable *intensity*: condensed high-volume input or spaced long-term interventions
  - Engagement of a *number of systems* (school, social services, youth justice)
  - Powerful *conceptual frame*. Strong advice in relation to potential incidents
  - **Balance** between *rigidity* built into the protocol and highly *specified method* of implementation while avoiding mechanistic manualisation to *respond* to unpredictable *situations*
  - Strong focus on the therapist in *relation to the family*, in terms of the commitment expected from the therapist and the support given to the therapist by an expert holding environment
  - **Multimodal** as opposed to *multicomponent*
  - Systematic and forceful *mobilisation of parents* ads the primary therapeutic agents for the intervention

They share the challenge of being in a mental health setting which fosters and reimburses individual rather than relational diagnoses
Family Interventions

- **Parent training** is ineffective or even iatrogenic
  - When delivered together with adolescent-only groups, behavioural problems soar.

- **Multidimensional Foster Care (MTFC)** (conflicting evidence)
  - Youth are placed in foster homes for 6-9 months while their families are prepared by systemic therapy
  - Foster parents have received **20 hours of training**
  - A team of professional therapists and coaches
  - Daily contact
  - Prepare biological parents with family therapy intervention
  - **Excellent results** of US and a first **Swedish** trial have not been replicated in following studies
  - **UK evidence** does not confirm effectiveness

Westermark, Hansson & Vinnerljung, 2008; Biehal, Ellison & Sinclair, 2011; Alexander & Parsons, 1973; 1982; Green et al., 2014
Multidimensional Foster Care (MTFC)

- Good results:

<table>
<thead>
<tr>
<th>Category</th>
<th>MTFC</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in delinquency</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Programme completion</td>
<td>73%</td>
<td>36%</td>
</tr>
<tr>
<td>Criminal referrals (2 years f-o)</td>
<td></td>
<td>24%</td>
</tr>
</tbody>
</table>

At 2 years follow-up, rates of self reported violent of the MTFC group were 4-9x higher

Chamberlain & Moore, 1998; Chamberlain & Reid, 1998)
Multidimensional Foster Care (MTFC)

- Good results, somewhat inconsistent evidence:

  Girls

- The rates of unwanted pregnancy are lower in the MTFC group
- 67% decrease in incarceration (2 years f-o)
- 62% reduction of stay in locked-in settings

This treatment has shown usefulness in diverse contexts:
- Mental state hospitals
- Child welfare system
- Female delinquent girls with trauma histories

Chamberlai, Leve & Degarmo, 2007; Leve & Chamberlain, 2007; Leve, Chamberlain & Reid, 2005; Chamberlain & Reid, 1991; Chamberland, Moreland & Reid, 1992
Functional Family Therapy (FFT)

- Now part of CYP-IAPT
- Manualised programme: 8-30 hours (limited evidence)
  - Achieve changes in family patterns of interaction and communication
    - Targets and family and individual
    - Sometimes see youths in their homes
    - Youths with callous-unemotional traits show bigger changes
    - Results not replicated in substance-abusing youth
    - Estimated savings per case: US$ 13,000
    - Requires considerable training and supervision

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**Independent evaluation**

<table>
<thead>
<tr>
<th>Recidivism</th>
<th>Offending of siblings</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFT</td>
<td>Client-centered counseling</td>
</tr>
<tr>
<td>73%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Family Interventions

- Brief Strategic Family Therapy (**insufficient evidence**)
  - Can reduce behavioural problems
  - Designed to last 4 months
  - Focused in changing the youths behaviour, not the whole relational apparatus of the family
  - Engage families that normally are antagonistic to psychosocial interventions

- Multidimensional Family Therapy (MDFT) (**strong evidence**)
  - Originally designed for **adolescent drug abuse**
  - Works with both parents and teen in individual sessions, and joint sessions
  - Developmentally sensitive
  - Very customisable to the particular family
  - 1 to 3 times a week for 3 to 6 months both in clinic like at home.
  - It’s evidence is strong, because it has been compared with other strong therapies.

- New attachment-base family therapies are being developed and tested
  - CONNECT: attachment and mentalization
  - Pre-post $d=0.75$

Szapocznik, Hervis & Schwartz, 2003; Liggle, 2002; Diamond et al., 2010
Family Interventions: Multisystemic Therapy

- Developed specifically for **youth conduct problems**
  - Designed to work with **hard-to-reach** families

- Effective treatment for **serious juvenile offenders**. Good quality evidence.
  - Addresses the **multidetermined nature** of severe conduct problems
  - Sees the **family** as a key factor in change
  - Uses the **adolescent’s home** as the primary site of intervention
  - **Integrates** several evidence-based **techniques**
  - Uses the same therapist to deliver **multiple modalities** of intervention within a **singular conceptual framework**
  - Rigorous **monitoring** of the **adherence** to the model

**NICE** have identified MST as the **most promising** intervention for reducing adolescent **antisocial** and **offending** behaviour

Henggeler et al, 1998; Littell, Popa & Forsyth (2005); NICE, 2009; 2013
**MST**: Meta-analysis of post-treatment results (continuous outcomes)

### Aggressive behaviour and offences: rated by researcher/clinician

<table>
<thead>
<tr>
<th>Study ID</th>
<th>Age</th>
<th>Type</th>
<th>Control</th>
<th>Outcome</th>
<th>Weeks</th>
<th>SMD (g) (95% CI)</th>
<th>Weight</th>
<th>N</th>
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<tbody>
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<td>BORDUIN2002</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>MPRI-A</td>
<td>30</td>
<td>-1.46 (-2.10, -0.82)</td>
<td>10.37</td>
<td>48</td>
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<tr>
<td>BUTLER2011</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>OffBeh</td>
<td>26</td>
<td>-0.21 (-0.59, 0.17)</td>
<td>16.95</td>
<td>108</td>
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<tr>
<td>DIRKS-LINHORST2003</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
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<td>HENGGELE1992</td>
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<td>TX</td>
<td>TAU</td>
<td>OffBeh</td>
<td>59</td>
<td>-0.54 (-1.07, -0.01)</td>
<td>12.67</td>
<td>84</td>
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<td>HENGGELE1997</td>
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<td>TAU</td>
<td>OffBeh</td>
<td>17</td>
<td>-0.29 (-0.62, 0.05)</td>
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<td>OGDEN2004</td>
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<td>TX</td>
<td>TAU</td>
<td>CBCL-ES</td>
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<td>-0.23 (-0.64, 0.18)</td>
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<td>ROWLAND2005</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>OffBeh</td>
<td>26</td>
<td>-0.24 (-0.93, 0.45)</td>
<td>9.52</td>
<td>55</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td><strong>SMD: -0.47 (-0.74, -0.21)</strong></td>
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### Drug & Alcohol: rated by researcher/clinician

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<th>Study ID</th>
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<th>Control</th>
<th>Outcome</th>
<th>Weeks</th>
<th>SMD (g) (95% CI)</th>
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<td>HENGGELE1999</td>
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<td>TAU</td>
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<td>TAU</td>
<td>DS%+ve-C</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td><strong>SMD: -0.62 (-2.07, 0.83)</strong></td>
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</table>

### Aggressive behaviour: rated by parents

<table>
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<tr>
<th>Study ID</th>
<th>Age</th>
<th>Type</th>
<th>Control</th>
<th>Outcome</th>
<th>Weeks</th>
<th>SMD (g) (95% CI)</th>
<th>Weight</th>
<th>N</th>
</tr>
</thead>
<tbody>
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<td>BORDUIN1995</td>
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<td>TX</td>
<td>TAU</td>
<td>MPRI+</td>
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<td>TAU</td>
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<td>TX</td>
<td>TAU</td>
<td>CBCL*</td>
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<td><strong>SMD: -0.25 (-0.52, 0.02)</strong></td>
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</tbody>
</table>

**NOTE**: Weights are from random effects analysis

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**Favours intervention Favours Control**
## Aggressive behaviour: rated by researcher/clinician

<table>
<thead>
<tr>
<th>Study</th>
<th>Age</th>
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<td>BORDUIN1995</td>
<td>11+</td>
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<td>OffBeh</td>
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<td>-0.68 (-1.08, -0.28)</td>
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<tr>
<td>LESCHIED2002</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>OffBeh</td>
<td>156</td>
<td>0.03 (-0.19, 0.26)</td>
<td>21.44</td>
<td>412</td>
</tr>
</tbody>
</table>

Subtotal (I-squared = 90.7%, p = 0.000)

**SMD: -0.41 (-0.93, 0.10)**

## Drugs & Alcohol: rated by researcher/clinician

<table>
<thead>
<tr>
<th>Study</th>
<th>Age</th>
<th>Type</th>
<th>Group</th>
<th>Outcome</th>
<th>Weeks</th>
<th>SMD (g) (95% CI)</th>
<th>Weight</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>HENGGELE1999</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>UDS*</td>
<td>226</td>
<td>0.08 (-0.29, 0.46)</td>
<td>51.29</td>
<td>118</td>
</tr>
<tr>
<td>HENGGELE2006_MMM</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>DS%+ve-C</td>
<td>52</td>
<td>-1.27 (-1.84, -0.71)</td>
<td>48.71</td>
<td>72</td>
</tr>
</tbody>
</table>

Subtotal (I-squared = 93.5%, p = 0.000)

**SMD: -0.58 (-1.91, 0.75)**

---

**NOTE:** Weights are from random effects analysis
MST: Meta-analysis of follow-up results (dichotomous outcomes)

<table>
<thead>
<tr>
<th>Study ID</th>
<th>Age</th>
<th>Type</th>
<th>Group</th>
<th>Weeks</th>
<th>RR (95% CI)</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORDUIN1995</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>1143</td>
<td>0.58 (0.32, 1.06)</td>
<td>15.06</td>
<td>176</td>
</tr>
<tr>
<td>BORDUIN2002</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>467</td>
<td>0.33 (0.12, 0.88)</td>
<td>8.44</td>
<td>48</td>
</tr>
<tr>
<td>BUTLER2011</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>78</td>
<td>0.21 (0.08, 0.59)</td>
<td>8.05</td>
<td>108</td>
</tr>
<tr>
<td>HENGGELE1999</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>48</td>
<td>1.23 (0.70, 2.15)</td>
<td>16.17</td>
<td>118</td>
</tr>
<tr>
<td>LESCHIED2002</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>156</td>
<td>1.03 (0.88, 1.22)</td>
<td>26.90</td>
<td>412</td>
</tr>
<tr>
<td>TIMMONS-M2006</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>98</td>
<td>0.77 (0.61, 0.97)</td>
<td>25.38</td>
<td>105</td>
</tr>
</tbody>
</table>

Subtotal (I-squared = 74.4%, p = 0.002)

RR: 0.72 (0.51, 1.01)

Drugs & Alcohol: rated by researcher/clinician

<table>
<thead>
<tr>
<th>Study ID</th>
<th>Age</th>
<th>Type</th>
<th>Group</th>
<th>Weeks</th>
<th>RR (95% CI)</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>HENGGELE1999</td>
<td>11+</td>
<td>TX</td>
<td>TAU</td>
<td>226</td>
<td>1.61 (0.94, 2.76)</td>
<td>100.00</td>
<td>118</td>
</tr>
</tbody>
</table>

Subtotal (I-squared = .%, p = .)

RR: 1.61 (0.94, 2.76)

NOTE: Weights are from random effects analysis
Results are **heterogeneous** among studies

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Standardised Median Difference (SMD)</th>
<th>Number of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-treatment Offending Behaviour</td>
<td>-0.47 (95% CI [-0.74, -0.21], p&lt;.0001)</td>
<td>7</td>
</tr>
<tr>
<td>Parent-rated antisocial behaviour (compared to TAU)</td>
<td>-0.25 (95% CI [-0.52, -0.02], p=.07)</td>
<td>8</td>
</tr>
<tr>
<td>Follow-up (12-17 months)</td>
<td>-0.41 (95% CI [-0.93, 0.10], p=.10)</td>
<td>5</td>
</tr>
<tr>
<td>Risk reduction on dichotomous variables</td>
<td>RR=.72 (95% CI [0.51, 1.0], p=.05)</td>
<td>6</td>
</tr>
</tbody>
</table>
MST: Therapist’s adherence predicts outcome

Living at home

Therapist Adherence

65 75 85 95

87% 91% 94% 95%

In School or work

Therapist Adherence

65 75 85 95

71% 76% 80% 84%

New arrests - MALE

65 75 85 95

26% 22% 19% 16%

New arrests - FEMALE

65 75 85 95

13% 11% 9% 7%

Löfholm, 2014
### MST: Effects on recidivism and out-of-home placement

<table>
<thead>
<tr>
<th>Study</th>
<th>Reduction in Recidivism</th>
<th>Reduction in Placements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borduin et al. (1990)</td>
<td>72%</td>
<td>not assessed</td>
</tr>
<tr>
<td>Henggeler et al. (1992)</td>
<td>43%</td>
<td>64%</td>
</tr>
<tr>
<td>Borduin et al. (1995)</td>
<td>63%</td>
<td>57%</td>
</tr>
<tr>
<td>Henggeler et al (1997)</td>
<td>26%</td>
<td>3%</td>
</tr>
<tr>
<td>Henggeler, Pickrel et al. (1999)</td>
<td>196%</td>
<td>50%</td>
</tr>
<tr>
<td>Henggeler, Rowland et al. (1999)</td>
<td>not assessed</td>
<td>49%</td>
</tr>
<tr>
<td>Ogden &amp; Halliday-Boykins (2004)</td>
<td>no juvenile justice system</td>
<td>78%</td>
</tr>
<tr>
<td>Rowland et al. (2005)</td>
<td>34%</td>
<td>68%</td>
</tr>
<tr>
<td>Timmons-Mitchell et al. (2006)</td>
<td>37%</td>
<td>not assessed</td>
</tr>
<tr>
<td>Stamburgh et al. (2007)</td>
<td>not assessed</td>
<td>54%</td>
</tr>
<tr>
<td>Ellis, Naar-King et al. (2008)</td>
<td>not appropriate</td>
<td>47%</td>
</tr>
<tr>
<td>Sundell et al. (2008)</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Letourneau et al (2009)</td>
<td>not assessed</td>
<td>59%</td>
</tr>
<tr>
<td>Borduin et al. (2009)</td>
<td>50%</td>
<td>80%</td>
</tr>
<tr>
<td>Glisson et al. (2010)</td>
<td>not assessed</td>
<td>53%</td>
</tr>
<tr>
<td>Butler et al. (2011)</td>
<td>41%</td>
<td>41%</td>
</tr>
<tr>
<td>Weiss et al. (2013)</td>
<td>41%</td>
<td>not assessed</td>
</tr>
<tr>
<td>Asscher et al., (2013)</td>
<td>51%</td>
<td>not assessed</td>
</tr>
</tbody>
</table>

**Average reduction:** 54% 50%
Multisystemic Therapy (MST)

- Long-term effects of MST after 20 years of intervention against individual therapy:
  - **Recidivism** rates are lower (38.4% vs. 54.8%)
  - Frequency of **misdemeanour offending** is 5x lower
  - Odds of involvement in family-related **civil suits** during adulthood **half** for MST.
Cost and Cost/effectiveness

• Promising studies carried out in the US show savings of US$ 9.51–23.59 per dollar spent.

• A **Swedish** study found **no savings** comparing MST and MAU

• A **small UK** study found a statistically **insignificant increase** in costs for MST

• **NICE** guidelines speculated savings of £7,000 in a cost offset analysis

(Cary et al., 2013; Klietz et al., 2010; NICE, 2013; Olsson, 2010a; 2010b)
Independent US replication

First independent US RCT with non-court-referred adolescents (N= 164; ages: 11-18)
Comparison group: TAU

Smaller effect sizes than previous studies but significant on 2 primary outcomes (p<0.05)
UK Pilot of MST at Brandon Centre

- **UK pilot** study in 2011 (N= 108 families, adolescents aged 13-17)
- **Comparison**: Treatment as usual by Youth Offending Teams (YOTs)

Butler et al., 2011
Qualitative Study of MST Implementation

- UK pilot study in 2011 (N= 108 families)
- Thematic analysis of 37 interviews (21 families: 21 parents, 16 young people)

Domain 1: Engagement in MST and Initial Process of Change
1. At family’s convenience
2. Holistic approach
3. Practical approach, early observable benefits
4. Strong therapeutic relationship, person centered
5. Therapist seen as source of support

Domain 2: Outcomes are complex
1. Increased parental confidence and skills
2. Relationship improves
3. Young person choosing to create a different future
4. Behaviour mostly improves
5. Not all targets met

Tighe et al., 2012
Implementing Randomisation: Scientific Context

“There is simply no serious scientific alternative to the generation of large-scale randomised evidence….RCT have a central role to play in the development of rational criteria for the planning of health care throughout the world.”

Peto, R, Collins, R. Gray, R

Why undertake an additional RCT?

• Will it replicate in the UK across sites? Need multisite to catch *variability of MAU* as well as generalisability.

• Large *pre-post* differences *not enough* in the UK.

• Change in parent rated behavior may not predict reduction in criminality.

• Need to understand *mechanism of change* which will only be possible from *sophisticated* (latent class mixed effects growth curve) *modelling* which requires *large sample* size.

• Need long follow-up to see *sleeper effects* as well as seeing if effects *wash-out*. 
The START project: Relevance

- In line with the UK Government’s current emphasis on developing **evidence-based, targeted, effective local services** that *represent value for money*.
- There is no strong evidence for **transportability** of MST beyond the US.
- This study will provide a “**home-grown**” benchmark
  - Will assure the **viability** of MST in the UK
  - Will provide the first **detailed map of** young people’s **service use**
  - Will **guide implementation** through knowledge about service structure
  - Will inform about **critical aspects of CYP mental health provision**
  - In line with **CYP IAPT**

(Cabinet Office, 2006)
The START follow-up project: Aims

• Evaluate the medium- to long-term efficacy of MST relative to MAU in the UK, as suggested by NICE guidelines.
  – Primary outcome: Criminal conviction 5 years post-randomisation
  – Secondary outcomes (4 years follow-up):
    • Arrests and cautions
    • Psychiatric problems
    • Educational progress
    • Work adjustment
    • Social relationships
    • Pregnancy (unplanned)
    • Physical health

• Evaluate the cost-effectiveness of MST relative to MAU

• Identify correlates of good service transition from child to adult and its association with outcome
Stakeholders

Funders

Clinical Teams

Committees

Research Team
Site location
The START project: recruitment

- 9 sites, representative of English population centres
  - 4 South-East
  - 4 in the North
  - 1 in East Anglia

- Two based at CAMHS, one in a YOT and the rest in multidisciplinary teams including social care, CAMHS, education and youth services.

- Referral routes:
  - 46% via children’s services
  - 20% via forensic services
  - 18% via child mental health services
  - 16% via educational services

- Participants were randomised to MST or MAU
  - 80% followed up to 6, 12 and 18 months
  - Clinical record data available for 100%

- All sites have adherence to the MST programme
Percent of treatments meeting minimum criteria for adherence
Percent of treatments meeting minimum criteria for adherence

Study site

Adherent Non-adherent

Total B F D H E C G A I
Research Team

Professor Peter Fonagy (CI)

Dr Stephen Butler (Co-Investigator)

Rachel Haley (Trial Coordinator)

London Hub
- Greenwich MST
- Hackney MST
- Merton & Kingston MST
- Reading MST

Leeds Hub
- Barnsley MST
- Leeds MST
- Sheffield MST
- Trafford MST

Cambridge Hub
- Peterborough MST
The START project: sample

- 684 families
  - Adolescents are 11-17 (mean=13.8) years old
  - 63% males
  - 66% from semi-skilled/unskilled background
    - 10.6% from a home where main carer is unemployed
  - Inclusion criteria
    - Persistent and enduring violent/aggressive behaviour or
    - Significant risk of harm to other or self or
    - A conviction or 3 warnings/reprimands or
    - Diagnosis of CD and record of unsuccessful outpatient treatment or
    - Permanent school exclusion
  - And at least 3 of the following:
    - Excluded or significant risk of school exclusion
    - High levels of non-attendance to school
    - Offending history or significant risk of offending
    - Previous episodes on the Child Protection Register
    - Previous episodes of being looked after
    - History of siblings being looked after
Percent committed an offense in year prior to randomisation

![Bar chart showing percent committed an offense in year prior to randomisation across different study sites. The chart is color-coded with red for any offense and green for no offense.](chart.png)
Percent committed violent offense in year prior to randomisation

Study site
Youth Offending Teams (young offenders) 22%
Children’s Services (at risk or out of home placement) 42%
Educational Services (permanent school exclusion) 15%
CAMHS (chronic severe conduct problems) 14%
Other (including police and housing) 7%

Number referred to multi-agency panel (SCREEN 1) N= 1,076
Letter offering visit by MST staff
Explanatory visit by MST team (SCREEN 2)
Phone appointment offered for research assessment
Consenting and baseline assessment (SCREEN 3) N= 684
Randomisation by research team N= 684

Exclusions:
Inappropriate referrals for MST (N=168)
Referral made, then lost contact (N=15)
Referral not taken further because of limited site’s capacity (N=22)
Referral advised but incomplete (N=40)
Referral not followed-up (N=28)
Other (N=14)

Refused to take part in the study (N=41)
Refused the intervention on offer (N=64)
Randomisation by research team  
N= 684

**MST**  
N= 342

**MAU**  
N= 342

**Baseline**

MST  
N= 305 of 342 (89%)  
Parents= 292 (85%)  
YP= 292 (85%)

MAU  
N= 279 of 341 (82%)  
Parents= 268 (79%)  
YP= 270 (79%)

**6 months**

MST  
N= 270 of 334 (81%)  
Parents= 250 (75%)  
YP= 250 (75%)

MAU  
N= 252 of 325 (78%)  
Parents= 237 (73%)  
YP= 237 (73%)

**12 months**

MST  
N= 257 of 327 (79%)  
Parents= 236 (72%)  
YP= 248 (76%)  
\$

MAU  
N= 234 of 317 (74%)  
Parents= 219 (69%)  
YP= 222 (70%)

**18 months**

MST  
N= 337 (99%)

MAU  
N= 334 (98%)

**18 months**

Dropped out of study (N=1)

Dropped out of study (N=24); unable to contact (N=23); failed visit (N=27); refused visit (N=25)

Dropped out of study (N=15); unable to contact (N=51); failed visit (N=27); refused visit (N=44)

Dropped out of study (N=18); unable to contact (N=47); failed visit (N=44); refused visit (N=44)

**Endpoint for primary outcome:**  
Out-of-home placement and criminal convictions
START: CONSORT Diagram

18 months

MST
N= 337
(99%)

MAU
N= 334
(98%)

YEAR 2

MST
N= 333
(97%)

MAU
N= 334
(98%)

YEAR 3

MST
N= 333
(97%)

MAU
N= 334
(98%)

YEAR 4

MST
N= 333
(97%)

MAU
N= 334
(98%)

YEAR 5

MST
N= 333
(97%)

MAU
N= 334
(98%)

Endpoint for primary outcome:
Out-of-home placement and criminal convictions

Year 2: Follow-up of secondary outcome & additional outcomes
(3% decline participation and further 3% attrition from 18 months)

Year 3: Follow-up of secondary outcome & additional outcomes
(10% attrition, 2% dropout, 4% unable to contact, 4% failed visit)

Year 4: Follow-up of secondary outcome & additional outcomes
(10% attrition, 2% dropout, 4% unable to contact, 4% failed visit)

ITT Year 5: Endpoint for primary outcomes based on case records
The START project’s design: Mixed-methods

a. Medium- and long-term follow-up of a multi-site pragmatic superiority trial: MST vs MAU in the UK.

b. A naturalistic study documenting
   i. young people and primary caregivers’ reports of change in key secondary outcome domains, as putative mediator
      – quality of parent-adolescent relationship
      – ability to foster relationships outside the family
      – self-efficacy
   ii. trial participants’ use of services
   iii. the characteristics of the services they used in relation to outcomes

c. Qualitative interview-based study
   i. Young people’s and caregivers’ experience of transition from child to adult services regarding outcomes.
   ii. To explore MST and MAU clinicians’ experiences of service delivery to investigate barriers to implementation.
Why does MST work?

- **Parenting** has a key **evolutionary function** for transmitting culture across the generation.

- Attachment is a key **evolutionarily determined mechanism** for marking an evolutionarily protected path for transmitting relevant, generalizable information across the generations (signaling trustworthiness of source).

- **Disorganized attachment** predicts conduct problems.

- MST focuses (but it could focus more) on **restoring the epistemic trust** a child can have in the parents, educators, and their social world.

- The organization and delivery of **all psychological therapies could benefit** from taking note of this system.
Thank you to the START research team (PIs, RAs, interns, and above all the families and young people who helped with this almost finished programme of work.

And thank you for listening!

Slides available from: P.Fonagy@UCL.AC.UK