Early intervention for preschool children with autism spectrum disorders

RCPsych ASD update
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What interventions do children with autism require?

• Managing behaviour
  - Reducing maladaptive behaviour
  - Managing anxiety

• Promoting social and communication abilities
  - Promoting social competencies
  - Providing a means of communication
  - Promoting ‘inclusion’

• Supporting the family
  - Supporting (and educating) parents; others
  - Educating health and educating practitioners
Developmental approaches

• Target the core social and communication difficulties of pre-schoolers with autism
• Based on developmental principles drawn from typical infant and toddler development
• We can test effective elements by adding specific treatments into an ongoing programme
• Increasingly studies test a pre-specified primary outcome theoretically coherent to the intervention
• More RCTs have been conducted within the social communication field than in the behavioural field

What do developmental approaches target?

• Based on developmental theory and evidence about typical infant and child development
  - Transactional models of infant and child development
  - Models of language and communication development
• Emergent (non-verbal) communication skills
  - Joint attention, imitation, pretend play, gestural communication
• Enhancing social reciprocity and social interaction
  - Building language and communication skills through interactions
• Building routines and repertoires
• Models and practices adapted to take account of atypical features in young children with autism
What do developmental consist of?

- All have structured and unstructured interaction sessions between the child and an adult
- Vary in the degree to which they incorporate or not specific behavioural techniques
- All involve the adult following the child’s lead
- Some involve direct therapist work with child
- All involve some parent work with child
- Better evidenced programmes
  - Early Start Denver Model (ESDM) – Rogers, Dawson
  - Joint Attention Symbolic Play Engagement and Regulation (JASPER) – Kasari
  - Preschool Autism Communication Trial (PACT) – Green, Aldred

What is joint attention?

- **Responding** to an adult
  - Following an adult’s gaze shift (‘gaze monitoring’)
  - Following an adult’s point
- **Initiating** a communicative exchange
  - Looking to an object and then back at the adult (‘checking out’)
  - Pointing to an object
- **Critical ‘precursor’ to language**
- **We are all experts at non-verbal communication** (without knowing it)....but not young children with autism
What follows from JA and joint action?

• Synchronous interaction b/t parent + child is context/scaffold emerging communication
  – Referential understanding (what is being said)
  – Intersubjectivity (comprehension that the acts of others have intent and communicative significance)
• Referential understanding is pivotal factor in vocabulary growth and pragmatic language use
• Behaviour of caregiver influences development
  – Attending to communication acts increases them
  – Expansion from child’s base (‘semantic contingency’) leads to more vocabulary

- N=58 3-to-4-year olds (~20 per group)
- 30 mins therapy session daily in nursery for 6 weeks
- Randomised into 3 groups:
  - One treatment focused on promoting JA skills
  - One on promoting symbolic play skills
  - Control ‘non-treated’ group
- ALL children receiving 30 hours a week ABA nursery program (1:1 or 1:2)
- JA (with researcher; with parent) and play at 6 weeks
- Language and child initiation outcomes at 12 months
Kasari et al (2010) *JADD*

- 38 preschoolers (36m) randomised to 24 sessions (8 weeks) PT focused on play-based, interactive + ABA procedures

- Focus on following child lead, imitation, joint action, joint engagement, expansions etc.

- Primary outcome caregiver-child play interaction
  - Unengaged
  - Object engagement
  - Joint engagement

![Fig. 2 Percent object engagement by group](image1)

![Fig. 3 Percent joint engagement by group](image2)
−15 hours per week of therapist-delivered intervention over 2 years with 24 month old children

−Parents also taught ESDM strategies and delivered 16 hours per week

The Early Start Denver Model (ESDM)

• Combines developmental, behavioural and ‘pivotal response’ approaches
• Emphasise interpersonal exchange and positive affect
• Shared engagement – real-life materials and activities
• Adult responsivity and sensitivity to child cues
• Focus on verbal and nonverbal communication
• Based on developmentally informed curriculum
• Strategies are consistent with ABA principles
  - Operant conditioning, shaping and chaining
Measurement of outcome

- Dawson, Rogers et al (2010)
- 2 years of 15 hours per week (+ parents)
- Improvements in IQ (Mullen)
- No drop in adaptive behaviour (VABS ABC) as for control group
- Developmental programme with social communication focus
- Both effects are driven by language and communication scores

<table>
<thead>
<tr>
<th>Subscale</th>
<th>24m change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mullen ELC</td>
<td>17.6 (SS)</td>
</tr>
<tr>
<td>Mullen RL</td>
<td>18.9 (T-score)</td>
</tr>
<tr>
<td>Mullen EL</td>
<td>12.1</td>
</tr>
<tr>
<td>Mullen VR</td>
<td>7.8</td>
</tr>
<tr>
<td>Mullen FM</td>
<td>-0.4</td>
</tr>
<tr>
<td><strong>VABS ABC</strong></td>
<td><strong>-0.8 (SS)</strong></td>
</tr>
<tr>
<td>VABS Com</td>
<td>13.7</td>
</tr>
<tr>
<td>VABS Soc</td>
<td>-4.6</td>
</tr>
<tr>
<td>VABS DLS</td>
<td>-6.2</td>
</tr>
<tr>
<td>VABS Mot</td>
<td>-9.9</td>
</tr>
</tbody>
</table>
Estes et al. (2015) JAACAP – 2 yr follow-up of ESDM

**Figure 1** IQ and Autism Diagnostic Observation Schedule (ADOS) severity by group and time point. Note: Error bars ± 1 standard deviation. COM = community; ESDM = Early Start Denver Model.

**ESDM clips:**

Infants with autism impact on parental style

• Fail to establish a communicative meshing or fit
  - Infant communicative signals are too weak or infrequent
  - Reduced meshing – ‘asynchrony’

• Parents are forced to recourse to didactic style
  - Parents perplexity
  - Parents ‘fill in the gaps’ or withdraw
  - Adult initiations
  - Strategies to re-direct child’s attention
  - Interactions are non-reciprocal
Staged programme with a focus on adapting parental communication

- Eliciting shared attention, communication, enjoyment
  - Child’s focus, inferring intentions
- Enhancing parental synchronous response
  - Comment, acknowledge, child’s focus, timing
- Adapted communication strategies for parents
  - Predictable sequences, routines, repetition, rehearsed play, imitation
- Developing/elaborating child communication
  - Expansions, elaborations, teasers

**Chain of effect:**

- **Parent change**
  - leads to
  - **Child interaction change with parent**
  - leads to
  - **Improved child interaction with others – symptom reduction**
Design

- First large RCT of an early psychosocial treatment
  - 3 site 2 arm, N=152
  - 2-4;11 yrs
  - core autistic disorder (ADOS-G/ADI-R)
  - Testing a model deliverable in the NHS
  - Cost effectiveness analysis
- Pre-specified primary outcome and analysis plan
- Blinded rating of outcomes
- Testing mediating mechanisms
- Use of RCT design to test basic science hypotheses

Outcome measures

- **Primary outcome**
  - ADOS-G Social + Communication total
  - External validity and change sensitivity
  - Modified implementation of module rules and scoring for use as an index of change (pers. comm. Cathy Lord)

- **Blinded secondary outcomes**
  - Parent-child interaction (PCI)
  - Language (PLS)
  - Social adaptation (teacher VABS)

- **Non-blinded secondary outcomes – parent rated**
  - Language (MCDI)
  - Early social communicative development (CSBS-DP-CQ)
Parent child interaction

Parental synchrony

Child initiations

Language (PLS)

Receptive language

Expressive language
Primary outcome ADOS-G

Parental report

- Language (MCDI)
  - Receptive: OR 3.4 (1.48 to 7.79)
  - Expressive: OR 1.63 (0.76 to 3.51)
- Early social communication abilities (CSBS)
  - Social composite: OR 2.49 (1.27 to 4.89)
- Parent report is ‘unblinded’ so may be ‘biased’ (i.e. a placebo effect)
- OR
- Parents might have become more attuned to their child’s emergent early social communication behavioural repertoire so more accurate reporters?
Attenuation of treatment effect on generalisation across interaction and context

PACT Intervention

Parent interaction with Child

Parental synchrony
ES=1.22

Child interaction with Parent

Child initiations
ES=0.41

Child interaction with Assessor

Autism symptoms (ADOS)
ES=-0.24

Social functioning in school
ES=-0.19

Child in School

CONTEXT

MEASURE


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Glass half full or half empty?

- At last autism research has been conducting RCTs!
- Many of the programmes have overlapping theoretical basis, aims and techniques
  - Behavioural; social communication and social interaction
- However, programmes are different each other
- Differences in emphasis on reported outcomes, parsimony of analysis
- How to compare and integrate ‘best practice’ from the accumulating evidence?
- What are the appropriate goals/outcomes?
  - And how do we measure them?

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Comm Dyadic</th>
<th>Comm Generic</th>
<th>Autism symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kasari et al. (2008)</td>
<td>T in nursery Daily for 6 weeks</td>
<td>Yes</td>
<td>Direct = Yes</td>
<td>Not reported</td>
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<tr>
<td>Dawson et al. (2010)</td>
<td>Intensive T and P for 24 months Not reported</td>
<td>Direct = Yes</td>
<td>Report = Yes</td>
<td>No</td>
</tr>
<tr>
<td>Kasari et al. (2010)</td>
<td>24 P sessions in 8 weeks; FU 12 m</td>
<td>Yes</td>
<td>Not reported</td>
<td>No</td>
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<tr>
<td>Green et al. (2010)</td>
<td>Fortnightly then monthly P input 12m</td>
<td>Yes</td>
<td>Direct = No</td>
<td>No</td>
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<tr>
<td>Landa et al. (2011)</td>
<td>Daily nursery T input and P weekly 6m</td>
<td>?</td>
<td>No</td>
<td>Not reported</td>
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<tr>
<td>Carter et al. (2011)</td>
<td>3.5m parent-training</td>
<td>No</td>
<td>No</td>
<td>Not reported</td>
</tr>
<tr>
<td>Kasari et al. (2014)</td>
<td>2 hours per week for 12 weeks; FU 12 weeks</td>
<td>Yes</td>
<td>Not reported</td>
<td>Not reported</td>
</tr>
<tr>
<td>Wetherby et al. (2014)</td>
<td>3 hours per week for 9m</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Parent-mediated social communication therapy for young children with autism (PACT): long-term follow-up of a randomised controlled trial

Andrew Polles, Ann Le Conte, Kathy Leathber, Erica Sidinome, Rachel Cole-Fletcher, Hannah Toles, Isabel Garmer, Jessica Lowry, George Vannakos, Sarah Byford, Catherine Aldred, Vicky Storey, Helen McConachie, Patricia Howells, Jeremy R Pari, Tony Chapman, Jonathan Green

Published Online
October 25, 2016
Effect of therapy on targeted parent behaviour

The substantial increase in parent ‘synchrony’ achieved during therapy lost over follow-up

- Age average 45 months
- 79% learning difficulties
- Language ability ~18 month level
- 23% phrase speech
Effect of therapy on targeted child behaviour with parent

Increase in child social communication with parent persisted

The time path of autism symptom severity

The reduction in researcher-rated autism symptom severity persists long after end of therapy
Summary

- This therapy with parents leads to reduction in child symptoms and enhanced child communication sustained for 6 years following treatment
  - Such long-lasting effects remarkable for a psychosocial intervention
- Efficient of therapist time - designed to be applicable to NHS
- Consistent with NICE guidance but adds strength of evidence
  - Appropriate as a key part of overall provision for children with autism
  - Applicability to milder disorder?
- Future work
  - Follow-up into adolescence
  - Research into mechanism of the sustained effect
  - Future work to refine and extend the therapy (‘PACT-G’ in homes and schools)
Enabling and empowering parents

Evidence that teaching parents promotes generalisation and maintenance of gains

• Parents are motivated to help their child but may face a long wait for ‘therapy’
• Providing parents with practical + concrete strategies supports parents as agents of change
• Parents value information; access to an autism expert; and are empowered when they see change occur (and their role in it)
• Though in no way do we suggest that this ought to be the sole provision offered to families...

Limitations and challenges

• Comprehensive approaches for children with ASD may comprise more than one approach
  - We know nothing about ‘additive’ effects
• Almost no equivalence trials
• We know much less about moderating and mediating factors then many assume
  - Most trials not powered to formally test these
• As in all trials there is very wide variability in response
  - The trials that have tested moderation have not found clear evidence that is often claimed as true e.g. ‘early is better’
Closing thoughts

- What should be the goal of interventions for people with autism?
- What makes a good outcome?  
  - And who defines this?
- Does the concept of intervention raise ethical or societal issues or challenge an ‘autistic identity’?
- How high should we set the bar for what counts as ‘good evidence’?
- How can we expand access to appropriate interventions?  
  - Even the modest ones recommended in the NICE guidelines
THANK YOU!

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