Autism and repetitive behaviours

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Repetitive behaviours

- part of the triad of impairments
  - social interaction
  - communication
  - repetitive behaviours

- a barrier to learning and skill development
- a barrier to socialising and peer acceptance
- a major concern for parents
Repetitive behaviours and autism: what do we know?

Repetitive Behaviours

- What are they?
- Why do they happen?
- How do they change?

Questions addressed in a 10 year review of research by Leekam, Prior & Uljarevic (2011), Psychological Bulletin 137(4) 562-593
Reviewing research on repetitive behaviours

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<td>Little known about natural history — few targeted interventions tested</td>
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1. What are repetitive behaviours?

- Many different repetitive behaviours are seen in children with autism
- Statistical approach of factor analysis organises behaviours into subgroupings
Factor analysis studies using the Repetitive Behaviour Questionnaire-2

RBQ-2: 20 Items

Example questions:

- Does your child...
  - Have repetitive hand or finger movements?
  - Spin self around?
  - Look at objects from particular angles?
  - Get upset about minor changes in objects?
  - Collect/hoard items of any sort?
  - Insist that daily routines stay the same?
Factor Analysis results: 2 factors

**Repetitive sensory and movement behaviours (RSM)**
- Repetitive hand/finger movements
- Spin self around
- Unusual interest in feel of surfaces
- Looking at angles of object

**Insistence on Sameness behaviours (IS)**
- Insisting on things at home remaining the same
- Upset about minor changes to objects
- Insist on same routine
- Same game/book/video
Results: Factor analysis studies using the RBQ-2 support a 2-factor structure

- **Typically developing**
  - 15 month-olds, 2 year olds, 6 year olds
  - Typical adults

- **Children with autism**
  - 2-17yr-olds

- **Results**: 2-factors found (RSM and IS)
  - A stable 2 factor structure remains (RM and IS) even when sensory items are excluded from analysis

These studies are reported in Leekam, et al. 2007; Arnott et al., 2010; Uljarevic, 2013; Lidstone, Uljarevic et al., 2014 (on Autism RPP Hub)
Summary – What are repetitive behaviours?

- In 2011 we reported 9 factors analysis studies of ASD in our review paper.
- Some identified 2 factors (RSM and IS) others reported more.
- By 2014* there had been 18 factor analyses studies, 12 found 2 factors (RSM and IS)
- Leekam, Prior & Uljarevic (2011); Uljarevic *(paper in progress)
2. Why do RBs happen—Why are RBs elevated in children with ASD?

Proposals

- RBs are triggered by **anxiety**

- RBs are triggered by **attempts to modulate arousal**
  - Ornitz & Ritvo (1968) oscillation between hyper and hypo-arousal
    - RBs reduce stimulation when child hyperaroused by sensory stimuli (soothe/avoid)
    - RBs increase stimulation when child hypoaroused (sensation seeking)

- Our question—How are anxiety and sensory responsiveness related to different types of RBs?
Children with ASD

- Child and Parent Behaviour study* – Cardiff
- 60 parents and children with ASD
- Age 2 to 17
- Parents completed the RBQ-2 (sensory items excluded), Sensory Profile, Spence Anxiety Scale

Published in Research in Autism Spectrum Disorders, Feb 2014; Lidstone, U ljarevic et al
Anxiety and RB

**Anxiety?**

- We found that **anxiety** was significantly associated with **insistence on sameness** behaviours but **not** with repetitive motor behaviours.
- Results support Rodgers, McConachie’s et al. earlier findings (2012).

Anxiety, RB and sensory responsiveness

- Sensory Profile scores, particularly sensory avoiding, mediated the relation between insistence on sameness (IS)-anxiety

Published in Research in Autism Spectrum Disorders, Feb 2014; 8 (2), 82-92
Anxiety, RB and sensory responsiveness

- But also evidence for sensory avoiding and anxiety reinforcing each other
Summary – Why do RBs happen?

- **Triggered by anxiety**
  - IS significantly linked to anxiety but not RMB

**Triggered by sensory responsiveness**

- IS may be a less optimal strategy for regulating sensation because sensory avoidance/sensitivity and anxiety reinforce each other
- RMB may be more optimal for regulation of sensation (stimulate/soothe) - associated both with both sensory seeking and avoidance
3. How do RRBs change?

- Do typical developmental pathways of RSM and IS subtypes look similar?
  - E.g. does elevated RSM early in development predict elevated IS outcome at 6yrs?
Longitudinal research with typical developing children

- Tees Valley Baby Study - social and cognitive development
- 20-item Repetitive Behaviour Questionnaire-2 (based on DISCO items)
- Parents completed RBQ-2 when their child was 15m, 26m, 77m

Leekam, Arnott, Meins et al. 2007; Arnott et. al. 2010
Typical development: 15mths

Arnott et al., 2010
Typical development: 15m and 2yr

Mean Intensity Score

- RSM
- IS

15 months
26 months
Typical development: 15m, 2yr, 6yr
Children with ASD

Mean Intensity Score

- RSM
- IS

15 months
26 months
77 months
ASD (2-17 yrs)
Typical development of RRB – outcome at 6yrs

□ Mirko Uljarevic PhD (2013)

□ What predicts insistence on sameness behaviours (IS) at 6yrs?
  - IS at 15 and 26mths? YES
  - RSM at 15 and 26 mths? NO

□ What predicts repetitive motor and sensory behaviours at 6yrs
  - RSM at 15m and 26mths? YES
  - IS at 15m and 26mths? NO

□ Repetitive behaviour types have separate pathways
How do RBs change?

- Development of RSM and IS is different.
- RSM and IS have independent pathways

**Implications for intervention**
- Targeting RSM behaviours may not have effect on IS behaviours

**Implications for genetic and neurobiological origins**
- Genetic studies find IS behaviours run in families (not RSM) (Shao, 2003)
- Neurobiological research proposes different brain networks linked to different behaviours (Langen et al. 2010)
| The influence of sensory symptoms in children and their parents |
Other findings - RB and sensory features in adults

- Typical adults have RBs but few sensory features (Sarah Barrett, MSc)
- However parents of children with ASD have elevated sensory features
- and the number of sensory features in parents are significantly associated with sensory features in their children (MU, PhD)

- Uljarevic, Prior & Leekam, Molecular Autism, in press
The link between repetitive behaviours and behaviour difficulties (behaviour in public, lack of cooperation, temper) in children with ASD is mediated by sensory features (Rachel Kent, PhD).

Question

Do sensory symptoms contribute to stress and anxiety for both children and their parents?
Children are likely to have both types of RB.

But each behaviour type has a different developmental pathway.

RM behaviours are frequent in the early years and continue in children with ASD at a higher rate.

They may be functional for regulating sensory stimulation.

IS behaviours may develop later in childhood, are more closely linked to anxiety and emotional problems.
Implications for practice

- Careful assessment of RB subtypes is needed (in relation to child’s developmental level)
- Important to consider the nature of sensory and anxiety triggers
- Behavioural interventions that target learning and reinforcement of alternative behaviours can be helpful.
- As new skills develop - interfering behaviours may reduce.
- Occupational therapy can help with adaptations to environment
- Where anxiety is a major presenting factor, cognitive therapy can be helpful
Repetitive Behaviours Research

Children and Parents’ Behaviour study

Jane Lidstone

Mirko Uljarevic

NHS collaborators: Anne-Marie McKigney, Hilary Kanaris, Julie Mullis, Ruth Paradice
Academic: Helen McConachie, Jacqui Rodgers, Mark Freeston, Newcastle University

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Repetitive Behaviours Research

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Thank you

- Remember that you can download the slides and summaries of articles mentioned in this talk at the website below (all presenters can upload)

http://www.autismrpphub.org