Perspectives on autism as a spectrum

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Keynote presentation for Australian Society for Autism Research Conference Dec 2014

NB. see http://sites.cardiff.ac.uk/warc/research/dsm-5-asd-summary/ for details of our work and/or if you would like to cite diagrams etc. from this presentation
UK Universities: Rachel Kent, Sarah Carrington, Mirko Uljarevic, Jane Lidstone, Cardiff; Prof. Ann Le Couteur, Newcastle
K-U Leuven University: Prof. Ilse Noens & Dr Jarymke Maljaars
Leiden University: Prof. Ina van Berckelaer-Onnes
National Autistic Society: Dr Judith Gould & Dr Lorna Wing, The Lorna Wing Centre
Lorna Wing 1928-2014

- First to describe the ‘triad of impairments’
- Published the first paper describing Asperger syndrome
- Introduced the concept of ‘autism spectrum’
- Challenged the categorical approach
Challenge to the categorical approach

1. There is vast variation in the manifestation of autism diagnostic symptoms (severity and pattern)

2. Autism diagnoses cannot be divided into neat separate subcategories

3. There are many associated non diagnostic features and associated disorders
Autism as a spectrum

Overview

• The diagnosis of Autism Spectrum Disorder
  Two perspectives compared
  - DSM5 ASD and Wing & Gould’s ASD

• Beyond diagnostic symptoms
  diagnostic symptoms and associated non-diagnostic features
Autism Spectrum? What does it mean?

Different meanings

1. Continuity between general population and clinical population*

2. Dimensional nature of autism within the autism clinical population*

....in terms of autism severity/pattern of presentation

Autism Spectrum Disorder: DSM-5

Language and ability level can vary across the autism

Social-Communication

Repetitive behaviours

ASD

Severity

Severity

Relevant across all ages

Kent, PhD (2014). Measuring autism spectrum disorder: associated features and diagnostic criteria. To cite this and other content go to http://orca.cf.ac.uk/59754/
Dimensional severity within the ASD population
- But severity and pattern varies for each symptom

Kent, PhD (2014)
Measurement

• How do you capture and measure the vast variability in symptoms?

• Operationalising the spectrum involves
  – Mapping a description of ASD onto specific behaviours
  – Designing and testing a specific algorithm applied to each individual

• For DSM-5?
Using the DISCO to measure the DSM-5 ASD description

*Diagnostic Interview for Social and Communication Disorders (DISCO)* is

- a standardised clinical interview tool
- suitable for children and adults, all abilities
- includes a range of diagnostic algorithms (but not specifically designed around the international classification systems)
- validated with ADI/ADOS
- covers all aspects of clinical picture – core and associated features (e.g. emotion, motor, adaptive functioning, maladaptive behaviour, overactivity, sleep, diet) and developmental skills
- distinct in its breadth – wide range of items

DSM-5 ASD: Domains and subdomains

(A) Impaired Social Communication

- Non-verbal communication
- Social-emotional reciprocity
- Developing and maintaining relationships

(B) Repetitive/restricted patterns of behaviours

- Excessive adherence to routines
- Restricted and fixated interests
- Hyper or hypo-reactivity to sensory input
- Stereotyped repetitive speech/motor/use of object

- DISCO algorithm - good sensitivity and specificity (AUC .92)

- Across age and ability

DSM-5 ASD
Good sensitivity and specificity

• Previous concerns – sensitivity or specificity
• First study to find good sensitivity and specificity
• Sensitivity also found in high functioning cases (94%)
• Indicates more positive news about the potential of DSM-5 criteria

The most essential DSM-5 criteria?

• Carrington et al., examined the DSM-5 DISCO items that discriminated most highly between children with ICD-10 clinical diagnosis and controls and found
  – A small set of social-communication items (particularly socio-emotional reciprocity)
  – Within repetitive behaviour domain, the sensory items were the most discriminating

You can download the full publication from the Wales Autism Research Centre website, http://sites.cardiff.ac.uk/warc/research/. See Research, DISCO Research or Sarah Carrington’s webpage
Autism Spectrum

• How does the DSM-5 description compare with the use of the term ‘autism spectrum’ in clinical practice – in particular that recommended by Wing & Gould’s original description?

• We compared measurement outcome for DSM-5 with measurement outcome for Wing & Gould’s original description of ASD

Language and ability level can vary across the autism

Social interaction

ASD

Social imagination / Repetitive behaviours

Social communication

Relevant across all ages

From Kent, PhD (2014)
Wing & Gould ASD items

reciprocal communication

Lack of OR/repetitive imagination

Quality of Social Impairment

Limited pattern of self chosen activities

Wing & Gould Autism Spectrum Disorder

UK sample: Good sensitivity and specificity (Leekam et al., JCPP 2002)
Netherlands sample: Specificity .96, Sensitivity .83, AUC .89 (Kent, 2014)
Comparing DSM-5 and W&G diagnostic output

- Two samples of children (N= 82; N=115)
- ASD and clinical controls
- DSM-5 algorithm run; W&G algorithm run
- ASD-Non ASD diagnosis
- High level of overlap in diagnostic output for DSM-5 and W&G ASD (90% overlap across samples)

Kent, PhD (2014)
Perspectives on autism as a spectrum: DSM-5-ASD and WG-ASD

Summary

• DSM-5 criteria can effectively identify those who would receive an ICD-10 autism diagnosis.
• There is a high overlap in diagnostic output using DSM5-ASD algorithm and Wing & Gould’s ASD despite differences in criteria
• A ‘spectrum’ concept (severity/number and pattern of symptom presentation) can be operationalised using a single diagnostic tool
Autism as a spectrum

Overview

Part 1:
• Diagnosing Autism Spectrum Disorder
  Two perspectives compared
  - DSM5 ASD and Wing & Gould’s ASD

Part 2
• Beyond diagnostic symptoms
  diagnostic and associated non-diagnostic features
What is an Autism Spectrum?

Different meanings

1. Continuity between general population and clinical population*

2. Dimensional nature of autism within the clinical population

3. Continuity between core and associated impairments
Diagnostic features

- Social communication impairment
- Restricted and repetitive behaviour
Diagnostic features: Repetitive behaviour:
Repetitive Behaviour Questionnaire (RBQ-2) example items

E.g. Does your child

- repetitively fiddle with toys?
- spin self round?
- rock backwards and forwards?
- look at objects from unusual angles?
- have special interest in the feel of surfaces?
- collect or hoard items?
- insist that aspects of routine stay the same?
- play the same music, game or video?
- Insist on things in the house remaining the same?

Leekam et al., (2007); J Child Psychol Psy; Arnott et. al. (2010,) J. Dev Beh Pediatrics
## Repetitive behaviour: Two subtypes

Repetitive Behaviour Questionnaire (RBQ-2)

<table>
<thead>
<tr>
<th>Motor and sensory</th>
</tr>
</thead>
<tbody>
<tr>
<td>• repetitively fiddle with toys?</td>
</tr>
<tr>
<td>• spin self round?</td>
</tr>
<tr>
<td>• rock backwards and forwards?</td>
</tr>
<tr>
<td>• look at objects from unusual angles?</td>
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<td>• collect or hoard items?</td>
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<td>• play the same music, game or video?</td>
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<td>• Insist on things in the house remaining the same?</td>
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</tbody>
</table>

Leekam et al. (2007), JCPP; Arnott et. al. (2010), JDBP
Subtypes of repetitive behaviours; Typical development

Mean Intensity Score

RSM – Repetitive Sensory and Motor.

IS – Insistence on sameness

Leekam et al. (2007, JCPP; Arnott et. al. (2010), JDBP
Subtypes of repetitive behaviours; ASD

Core and associated features of ASD

**Restricted and repetitive behaviour**
- Repetitive motor
- Insistence on sameness

**Associated**

- **Externalising**
  **hyperactivity/conduct problems**
  *Children with ASD have enhanced vulnerability for ADHD, CD, ODD*

- **Internalising**
  **emotional problems – anxiety, depression**
  *40-50% with ASD have clinical levels of anxiety*
Are subtypes of repetitive behaviour related to externalising and internalising behaviours in typical developing children?

- 126 typical 6-yr olds. Repetitive Behaviour Questionnaire-2 and Strength and Difficulties Questionnaire
- SES and language entered in step 1 and 2 of hierarchical regression analysis

1) Predictors of externalising behaviours?
   - Repetitive motor behaviour (but not insistence on sameness)

2) Predictors of internalising behaviours?
   - Insistence on sameness (but not repetitive motor behaviour)

(1) \( t=4.451, p<.001, \beta=.404 \)  (2) \( t=2.428, p=.017, \beta=.231 \)

Carrington, Arnott et al., in prep
Are subtypes of repetitive behaviour related to anxiety in children with autism?

3-17 year old children with ASD. Repetitive Behaviour Questionnaire-2 and Spence Children’s Anxiety Scale

- Repetitive motor behaviour subtype is not related to anxiety

✓ Insistence on sameness is related to anxiety
  $(r \ .46, \ p<.001)$

Sensory features and the relation between repetitive behaviours and anxiety features in ASD

• RBQ-2, Spence anxiety questionnaire and Sensory Profile
• Indirect relation found – sensory features influence the relation between repetitive insistence on sameness (IS) behaviours and anxiety

Lidstone, Uljarevic et. al, (2014), Res in Aut Spectrum Disorders, 8 (2), 82-92
Sensory features and the relation between repetitive behaviours and **maladaptive** behaviours

- DISCO interview data from 200 cases with ASD
- Indirect relation found – sensory features influence the relation between repetitive behaviour and maladaptive behaviour
Kent, 2014 examined relation with DSM-5 subdomains and found

- that all 3 subtypes predicted DSM-5 social-communic subdomains
- that the subtypes differentially predicted DSM-5 RRB subdomains
  - *Aloof* - motor and sensory
  - *Passive* - motor
  - *Active but odd* – motor, routines, restricted interest

See Wing and Gould, 1979; Wing, 1996, Wing, 1997

- Aloof
- Passive
- “Active but odd”
Core symptoms and associated features

- Core symptoms of ASD form separate subtypes with continuity across the typical population
- Subtypes of repetitive behaviour predict anxiety and externalising behaviour
- Sensory symptoms influence those relations
- Subtyping of social interaction may provide a useful way to study the relation with other core and associated features.
Implications

• For practice
  – Management and treatment recommendations adapted to an individual’s profile (different repetitive behaviours subtypes, different sensory modalities)

• For research
  – More systematic research needed on impact of sensory reactivity in children
  – and in parents (*new evidence on sensory symptoms in mothers)
  – New ways of thinking about the autism ‘spectrum’ beyond standard ‘severity’ models

Beyond severity models: New ideas and directions

Kent & Leekam, paper in prep.
Please refer to Kent PhD, 2014 *Measuring autism spectrum disorder: associated features and diagnostic criteria.* [http://orca.cf.ac.uk/59754/](http://orca.cf.ac.uk/59754/)
Thank you

The sponsors below supported the research on the DISCO presented here

http://sites.cardiff.ac.uk/warc/

More details of our work can be found on the WARC website (see Research pages)

The sponsor below contributed support for SL’s visit