Autism and eating disorders:

Developmental pathways in the general population

Professor Francesca Solmi

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University College London

Talk overview

- Overview of eating disorders
- Autism and eating disorders – where is the link?
- Trajectories of autistic social traits and disordered eating
- Possible mechanisms
- Emotion regulation and anorexia nervosa
- ARFID and autism

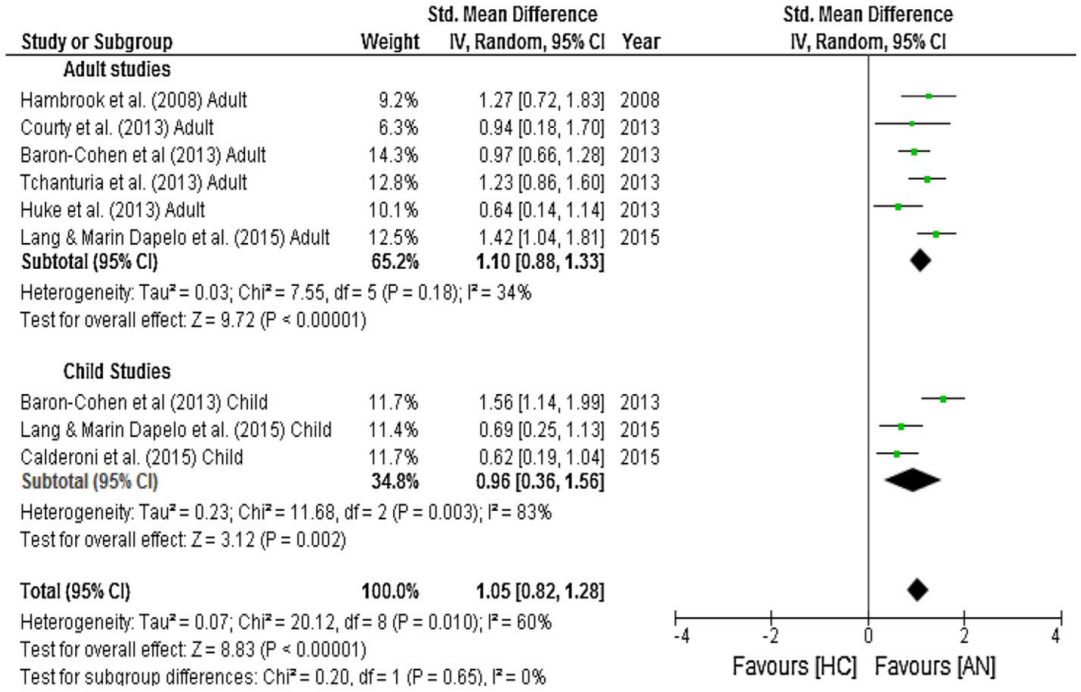
Conflict of interests

- I do not have any conflict of interests to disclose

ANOREXIA NERVOSA	BULIMIA NERVOSA	BINGE EATING DISORDER
Overvaluation of weight and shape		
Fear of weight gain	Binge eating episodes	
Extreme restriction	Compensatory behaviours	Eating 1. Faster 2. Until too full 3. Alone 4. when not hungry 5. Disgust/Guilt
Low weight in context of development stage		
OSFED		

Eating disorders

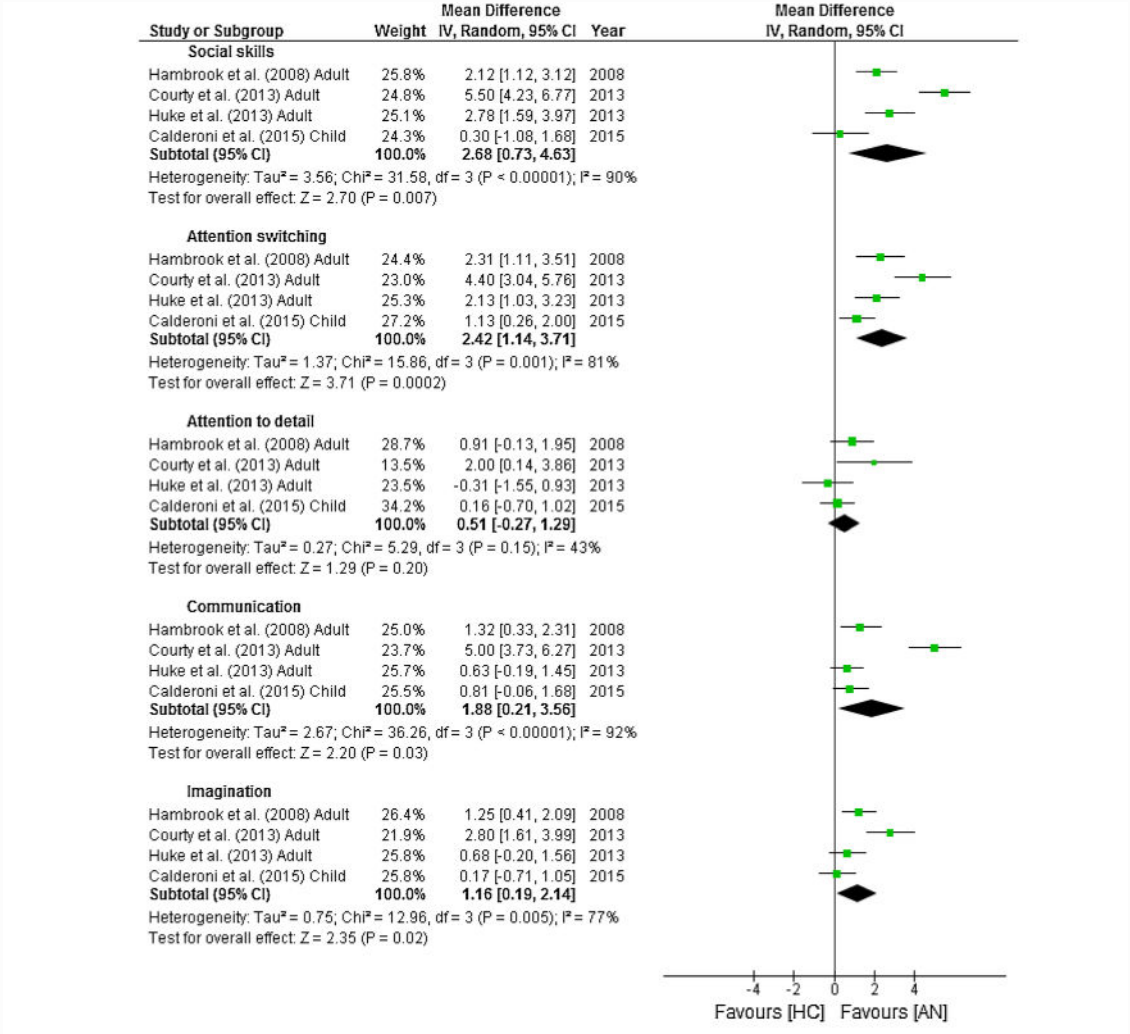
- Usually emerge in early to mid-adolescence
- High mortality and admissions rates
- More common in girls, likely underdiagnosed in boys.
- 0.2% to >5% point prevalence
- Incidence is increasing in the UK in young adolescents



Autism and anorexia nervosa

- People with anorexia nervosa and autism often mention:
  - Rigidity or rules
  - Intense interests
  - Difficulties recognizing hunger
  - Social difficulties

- People treated clinically for anorexia nervosa have higher prevalence of autistic traits (Westwood et al, 2016)



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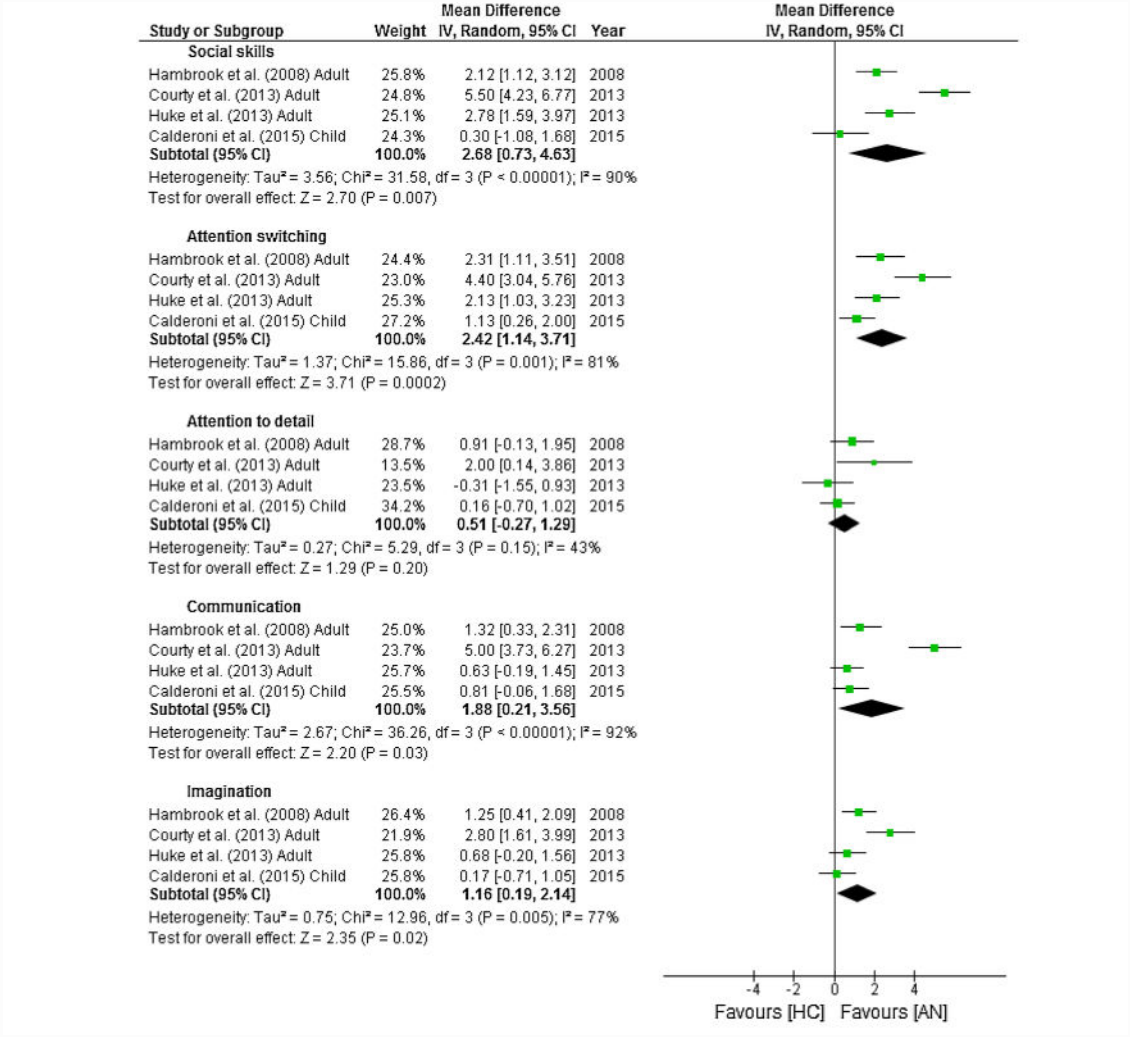

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- Severe malnutrition can lead to symptoms similar to autistic traits (less interest in social interactions, more rigid thinking)

REVIEW

WILEY

Disordered eating behaviours and autistic traits—Are there any associations in nonclinical populations? A systematic review

Stephanie Stensbjerg Christensen[1] | Mette Bentz[2] | Lars Clemmensen[2,3] | Katrine Strandberg-Larsen[1] | Else Marie Olsen[1]

Autism and eating disorders

In the general population

- Binge eating and purging behaviours associated with poor social and communication skills, and attention to detail
- Set shifting impaired mostly in participants with AN-like behaviours
- Many of these studies are cross-sectional, here too issues of direction of symptoms

The Journal of Child Psychology and Psychiatry

Journal of Child Psychology and Psychiatry **:* (2020), pp **–** doi:10.1111/jcpp.13255

Trajectories of autistic social traits in childhood and adolescence and disordered eating behaviours at age 14 years: A UK general population cohort study

Francesca Solmi,[1,*] Francesca Bentivegna,[1,*] Helen Bould,[2,3] William Mandy,[4] Radha Kothari,[5] Dheeraj Rai,[2,6,7] David Skuse,[5] and Glyn Lewis[1]

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Research questions

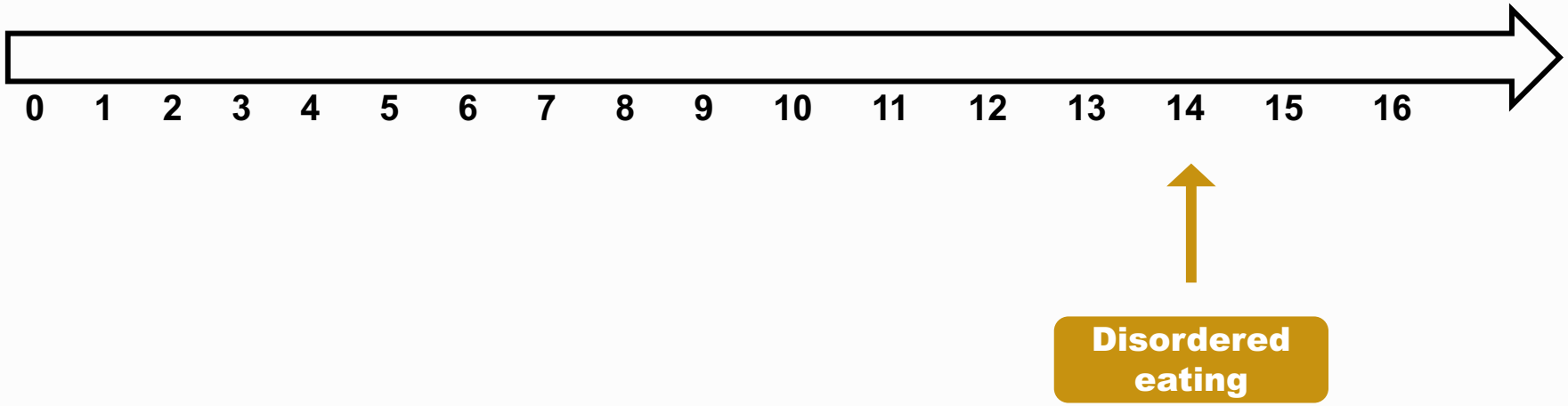
- Do we see differences in autistic traits among children who have later developed disordered eating behaviours?
- When do these differences emerge?
- Are differences greater in those with more severe disordered eating symptoms?

Our study

AVON LONGITUDINAL STUDY OF PARENTS AND CHILDREN (ALSPAC)

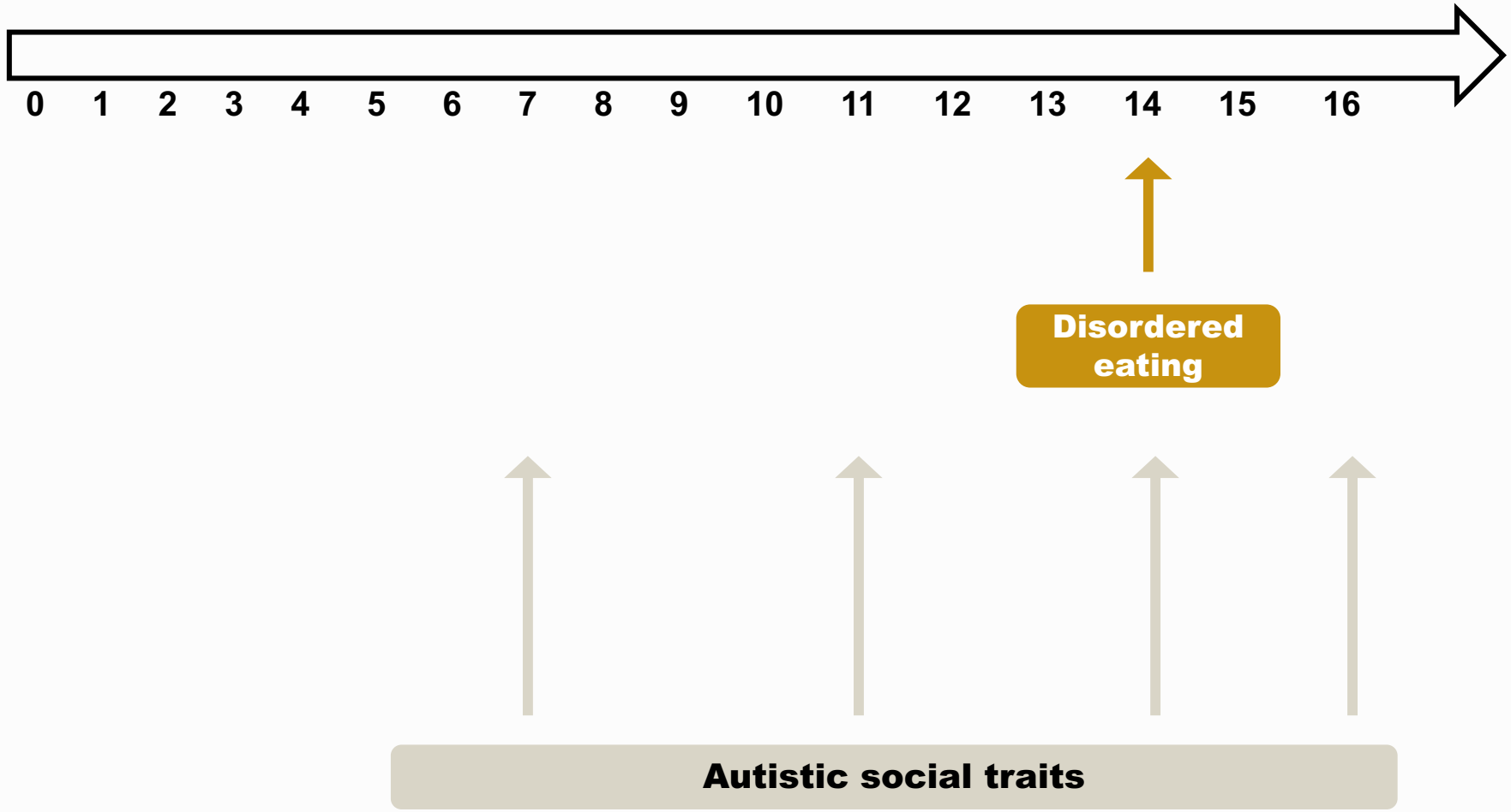
- **1990-1992:** All pregnant women in (former) Avon region (Bristol) invited
- **14,062** Babies enrolled, as well as their mothers and fathers.
- **33-35 years** of follow-ups with clinics, questionnaires, scans, genetic data.
- **>3,000 studies** published using ALSPAC data.

Our data



- **Dieting**
- **Fasting** (24 hrs)
- **Purging**
- **Binge eating**

Our data



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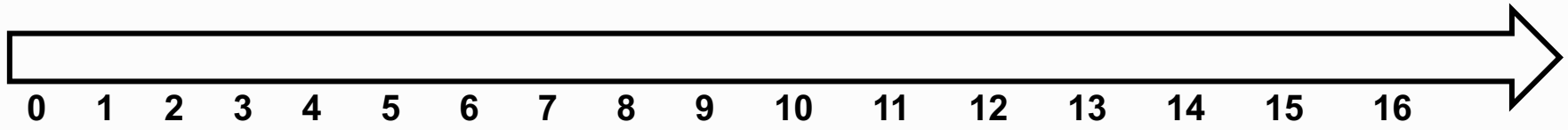


Disordered eating

- **Dieting**
- **Fasting** (24 hrs)
- **Purging**
- **Binge eating**

Autistic social traits

Social and Communication Disorders Checklist (SCDC)

1.	Not aware of other people's feelings
2.	Does not realise when others are upset or angry
3.	Does not notice the effect of his/her behaviour on other members of the family
4.	Behaviour often disrupts family life
5.	Very demanding of other people's time
6.	Difficult to reason with when upset
7.	Does not seem to understand social skills, e.g. persistently interrupts conversations
8.	Does not pick up on body language
9.	Does not appear to understand how to behave when out (e.g. in shops, or other people's homes)
10.	Does not realise if s/he offends people with her/his behaviour
11.	Does not respond when told to do something
12.	Cannot follow a command unless it is carefully worded

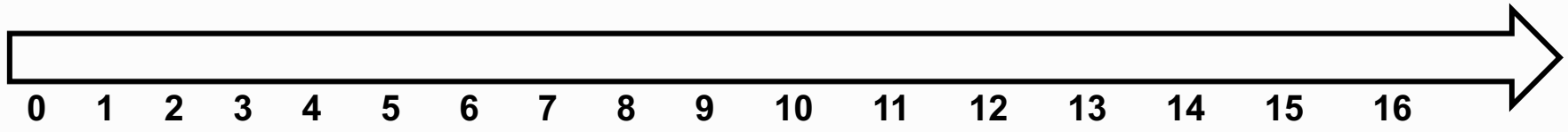
Social and Communication Disorders Checklist

Developed by Skuse, Mandy, Scourfield (Skuse at al, 2005)

90% sensitivity (% of people with autism correctly identified)

96% specificity (% of people without autism correctly identified)

Our data



Disordered eating

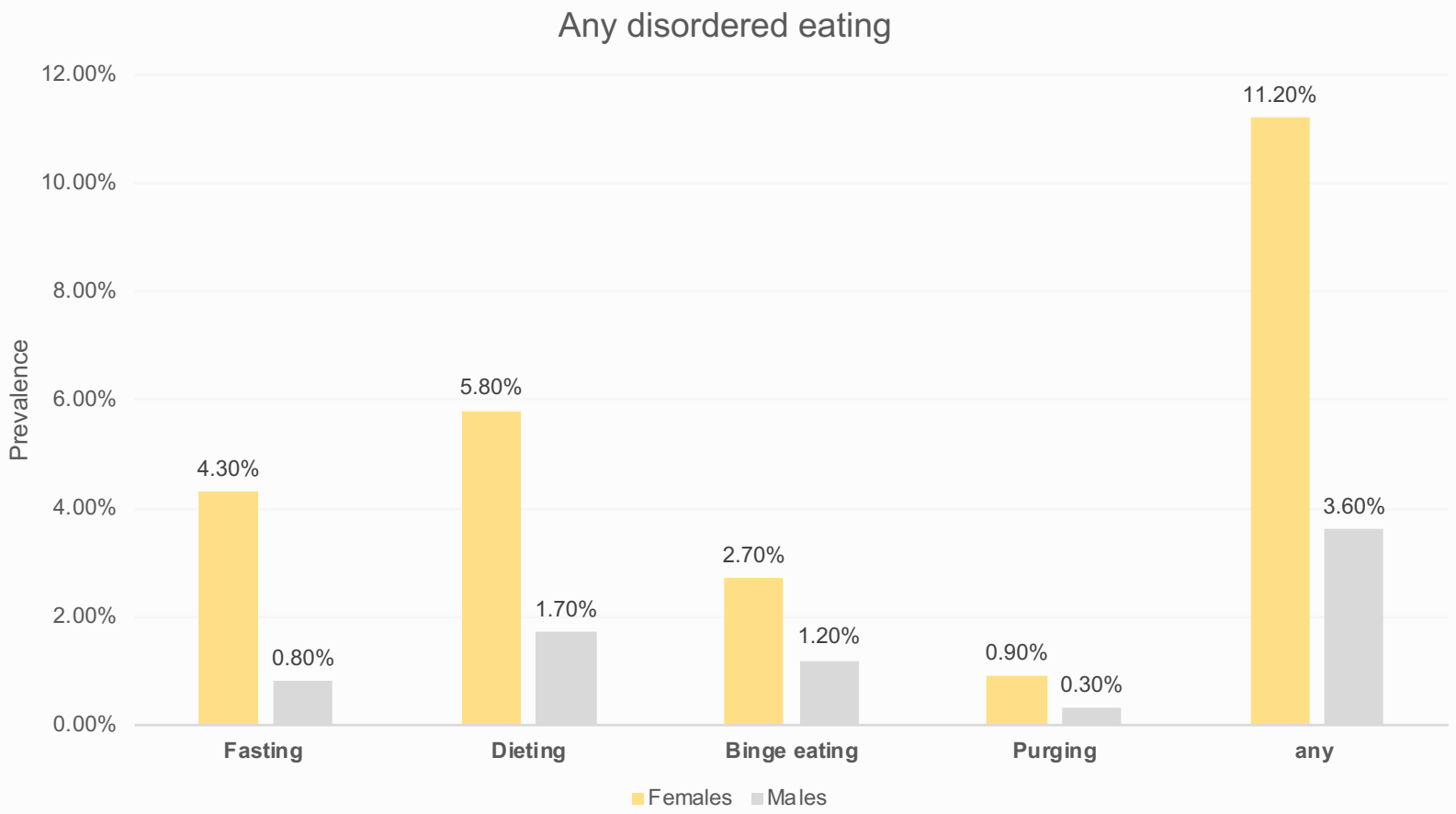
- **Dieting**
- **Fasting** (24 hrs)
- **Purging**
- **Binge eating**

- Sex
- Ethnicity
- Socio-economic status
- Maternal depression
- BMI
- Prenatal factors

Autistic social traits

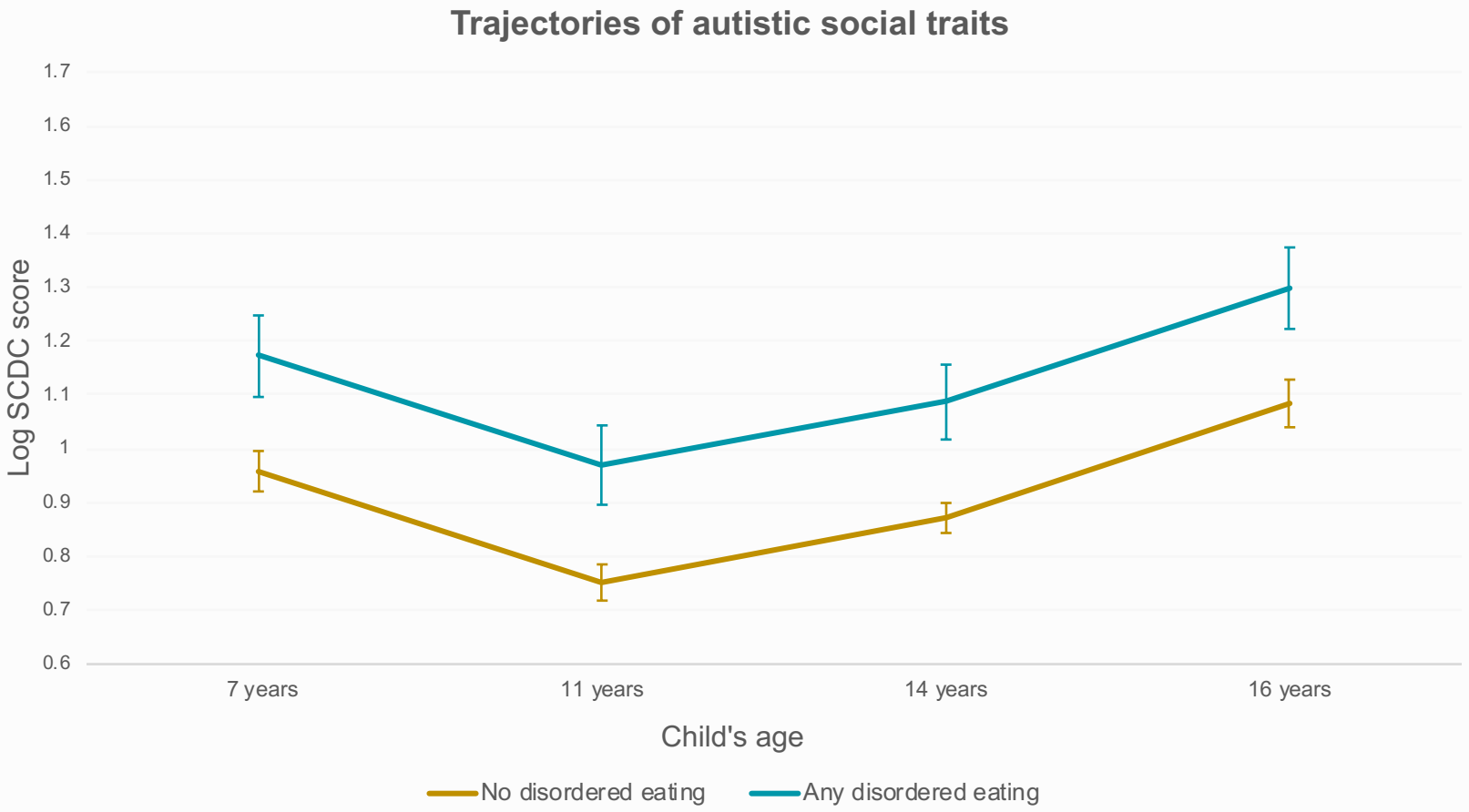
Social and Communication Disorders Checklist (SCDC)

The sample



- **5,381** participants
- **55.2%** girls

Trajectories of ASD traits and disordered eating



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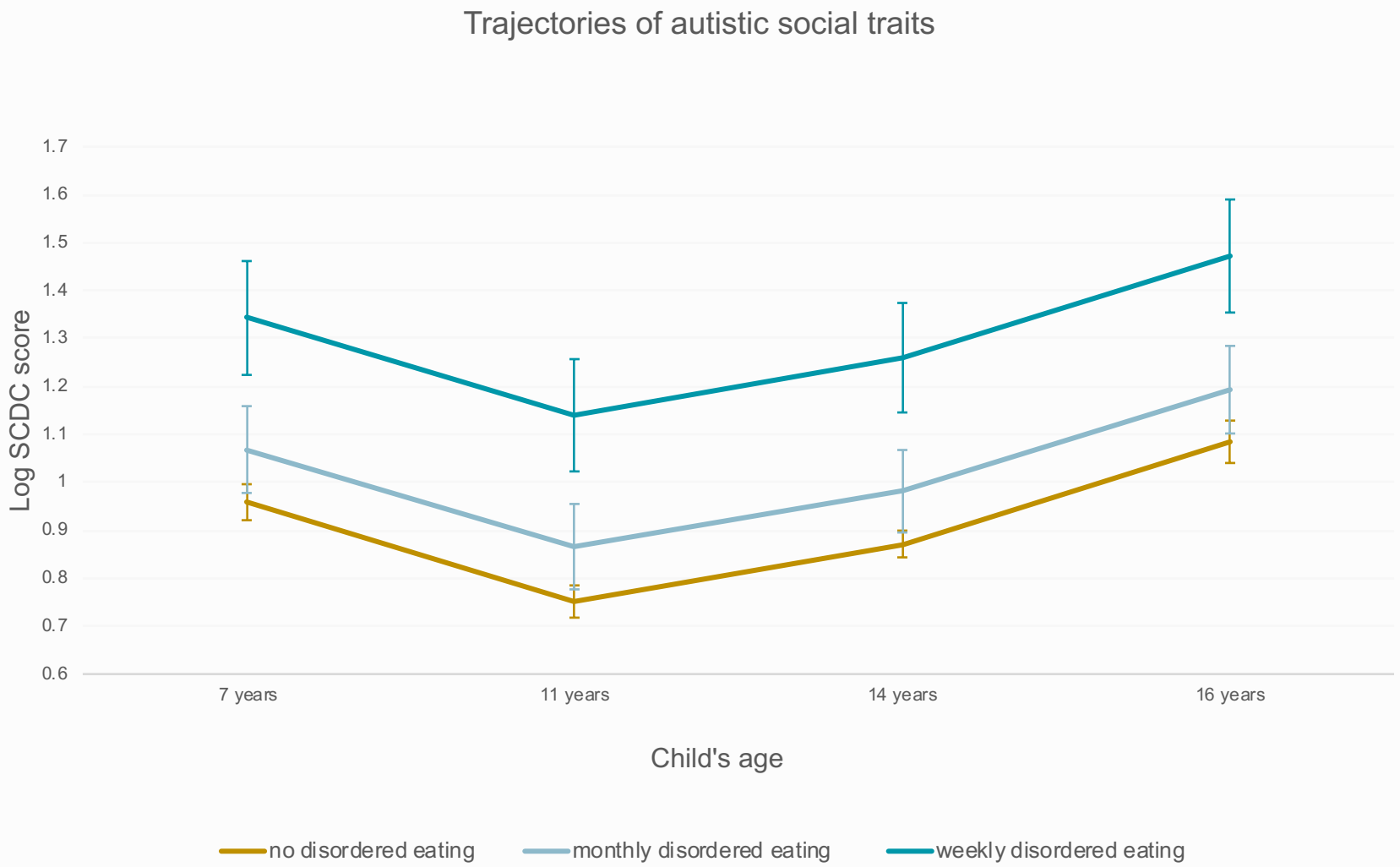

Meaning of our findings

- Children with difficulties in Social Communication that were already apparent at age 7 years were more likely to report symptoms of eating disorders by age 14 years – including binge eating and purging.

- More severe social communication difficulties corresponded to more severe eating disorder symptoms

- Differences are small, but persistent across childhood and adolescence.

Limitations

- **We could not explain:**
  - whether there were differences according to sub-type of eating disorder
  - If there are similar associations in relation to other autistic traits (e.g. repetitive behaviours)

PLOS ONE

RESEARCH ARTICLE

A mixed-methods approach to conceptualizing friendships in anorexia nervosa

Nandini Datta[1]*, Molly Foukal[2], Savannah Erwin[2], Hannah Hopkins[2], Kate Tchanturia[3,4,5], Nancy Zucker[2,6]

1 Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Stanford, CA, United States of America, **2** Duke University Department of Psychology and Neuroscience, Durham, NC, United States of America, **3** Department of Psychological Medicine, Section of Eating Disorders, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, United Kingdom, **4** South London and Maudsley NHS Trust, National Eating Disorders Service, Psychological Medicine Clinical Academic Group, London, United Kingdom, **5** Department of Psychology, Ilia State University, Tbilisi, Georgia, **6** Duke University School of Medicine Department of Psychiatry & Behavioral Sciences, Durham, NC, United States of America

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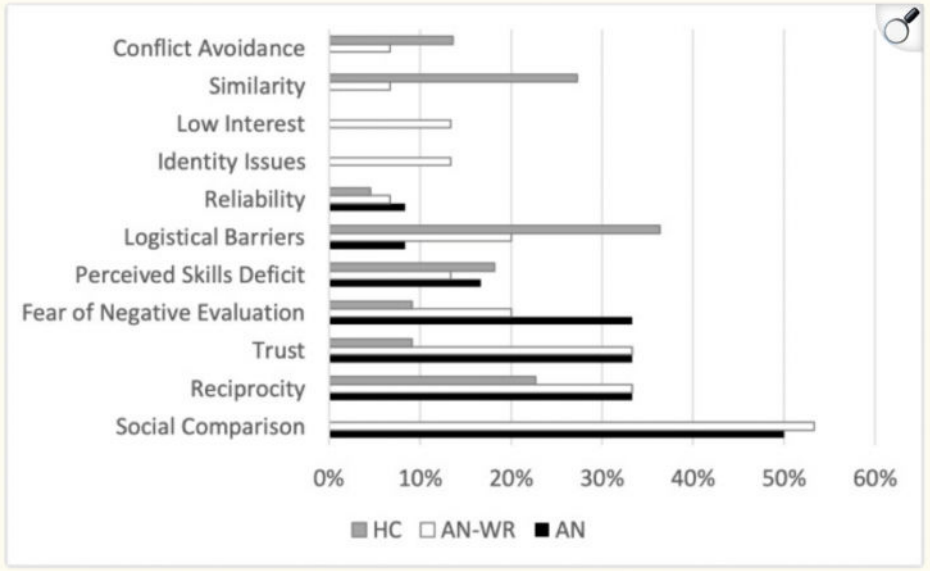
Check for updates

Fig 1. Frequency of themes: Greatest challenges in friendships.



Mechanisms: friendships

- Young people with elevated ASD traits might find friendships more challenging
- In adolescence, there is a shift from family to friends and these difficulties might intensify giving rise to mental health difficulties, including eating disorders
- Exposure to greater bullying? [upcoming work exploring this].

Mechanisms: health behaviours

- Young people with elevated ASD traits:
  - Greater sedentary behaviours
  - Lower physical activity
  - Increased BMI and vulnerability to weight stigma

Mechanisms: emotion regulation

- Emotion regulation refers to a person's ability monitor, appraise, and modify their emotions
- Difficulties regulating emotions are common in people with mental health difficulties
- Autistic children have greater difficulties regulating emotions
    - Some might seek out additional sensory stimuli to help regulate emotions (e.g. stimming)
    - Others might avoid stimuli they might find difficult
- Autistic children might be at greater risk
- Much literature had looked at emotion regulation in people with eating disorders, so it is not clear whether these are a *cause or a consequence* of the disorder

Research

JAMA Psychiatry | Original Investigation

Association of Emotion Regulation Trajectories in Childhood With Anorexia Nervosa and Atypical Anorexia Nervosa in Early Adolescence

Mariella Henderson, MSc; Helen Bould, PhD; Eirini Flouri, PhD; Amy Harrison, PhD; Gemma Lewis, PhD; Glyn Lewis, PhD; Ramya Srinivasan, BMBCh; Jean Stafford, PhD; Naomi Warne, PhD; Francesca Solmi, PhD

The research questions

Do patterns of emotion dysregulation across early to mid-childhood differ in adolescents who have anorexia nervosa and those who do not have anorexia nervosa?

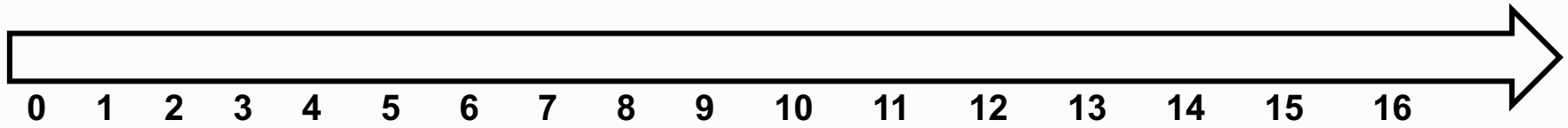
When do differences emerge?

Our study

MILLENNIUM COHORT STUDY

- **2000-2002:** children aged 9 months living in the UK
- **18,818** Babies enrolled, as well as their mothers.
- **22-24 years** of follow-ups with questionnaires, genetic data.
- Oversampled children from **ethnic minorities** and **those living in more deprived areas**

Our data



Emotion regulation

Children's Social Behavior Questionnaire

Anorexia nervosa

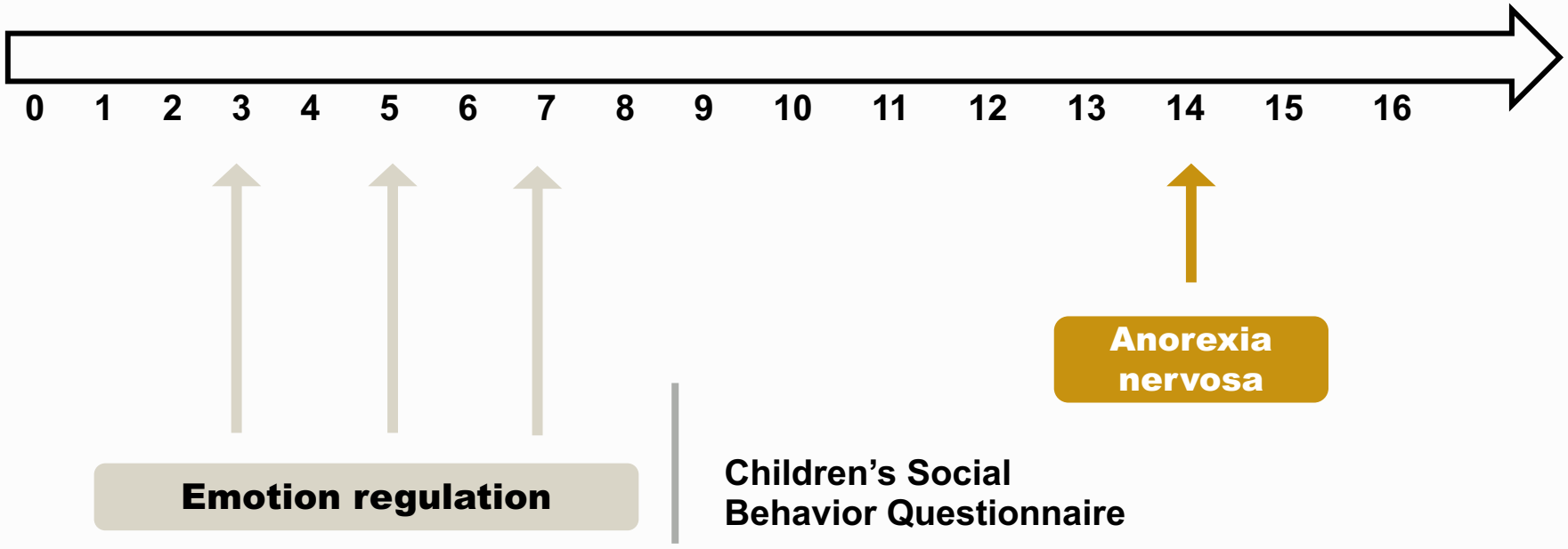
- High body dissatisfact
- Dietary restriction
- Normal or low BMI
- Perception of being overweight
- Meal skipping

Our data

eTable 1. Children's Social Behavior Questionnaire (CSBQ) Items

Subscale	Items	Scoring
Emotion Regulation	Child: a. Shows wide mood swings b. Gets over excited c. Is easily frustrated d. Gets over being upset quickly e. Is impulsive, acts without thinking	Caregiver scored how appropriate the statement was on a 3-point Likert scale: 0. Not true 1. Somewhat true 2. Certainly true *Item d. is reversely scored.*

Our data



- High body dissatisfact
- Dietary restriction
- Normal or low BMI
- Perception of being overweight
- Meal skipping

- Sex
- Ethnicity
- Socio-economic status
- Maternal, paternal depression
- Birth and prenatal characteristics

- Child BMI
- Maternal BMI
- Self-regulation at age 3
- Mental health difficulties at age 3
- Maternal attachment

Participants

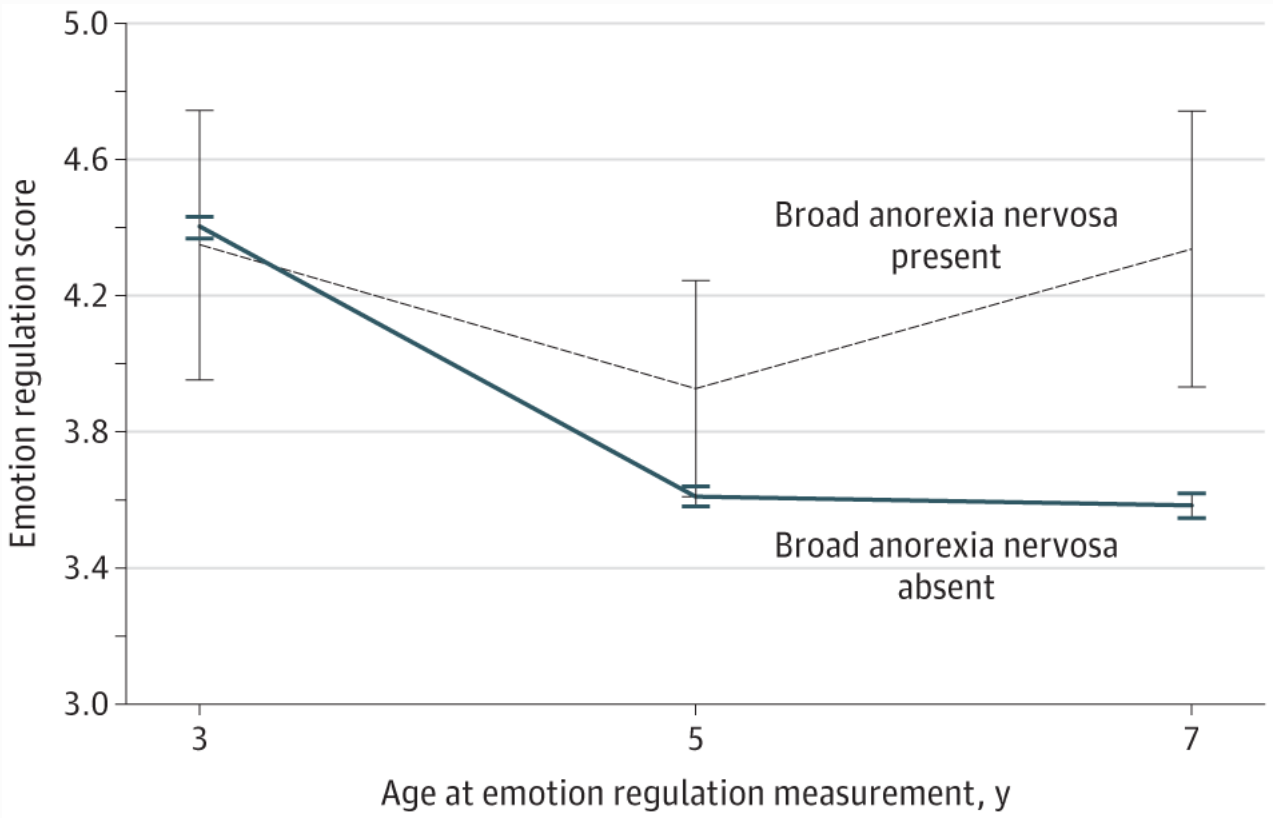
15,896 participants

- **49%** girls
- **15.5%** ethnic minority backgrounds

97 participants **(1.0%)** had symptoms consistent with a diagnosis of Anorexia Nervosa at age 14 years

- **88.7%** girls
- **12.4%** ethnic minority backgrounds

Our findings



Meaning of findings

- Children's' emotion regulation skills improve throughout childhood
- Children who have symptoms of anorexia nervosa at 14 have **similar levels of emotion dysregulation at 3 years of age** compared with those who do not have anorexia nervosa
- Differences emerge by 5 years of age and increase by 7 years of age

Exploring mechanisms

The Journal of Child Psychology and Psychiatry

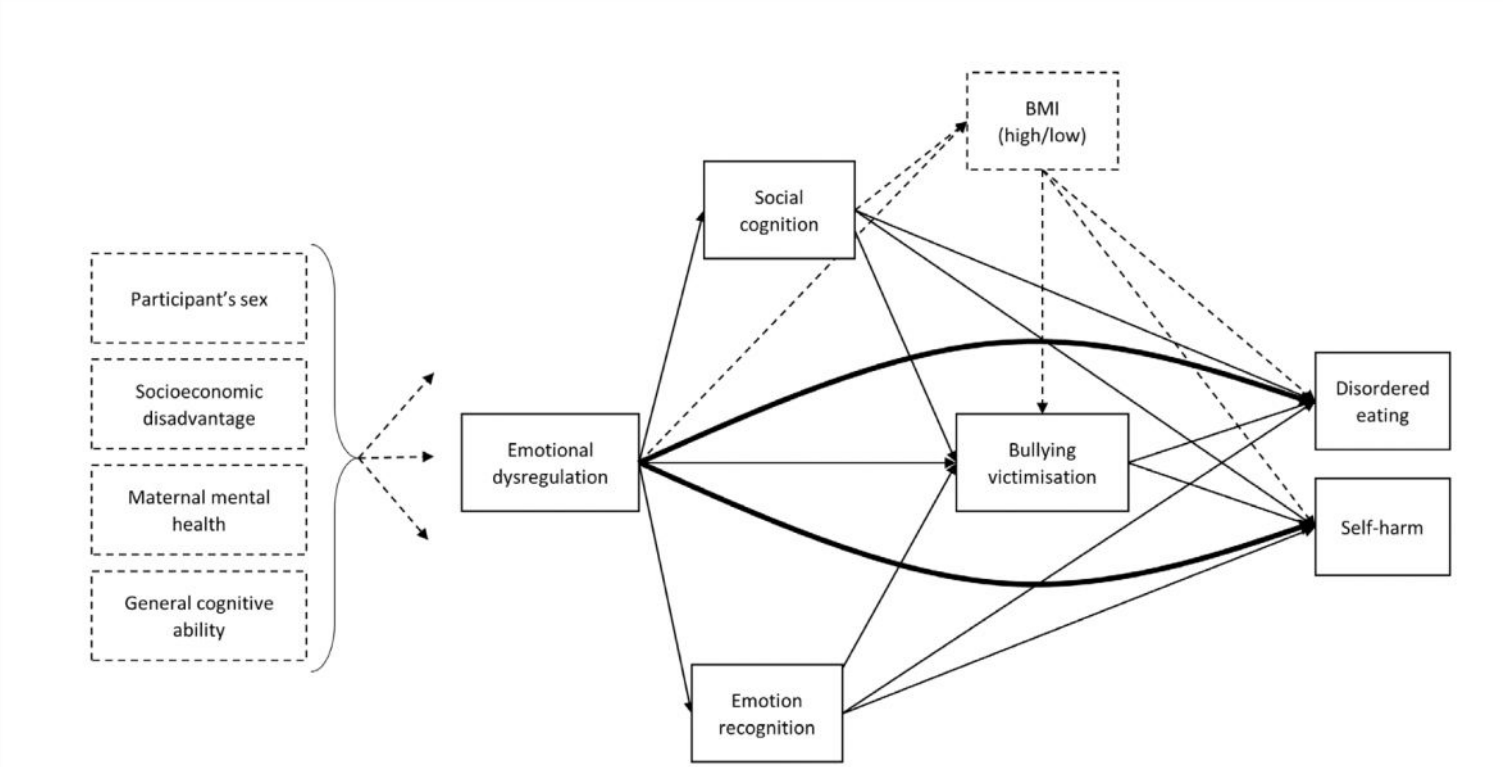
Journal of Child Psychology and Psychiatry 64:5 (2023), pp 797–806 doi:10.1111/jcpp.13738

Emotional dysregulation in childhood and disordered eating and self-harm in adolescence: prospective associations and mediating pathways

Naomi Warne,[1,2] Jon Heron,[1,2] Becky Mars,[1,3] Francesca Solmi,[4] Lucy Biddle,[1,5] David Gunnell,[1,3] Gemma Hammerton,[1,2] Paul Moran,[1,3,5] Marcus Munafò,[2,3,6] Ian Penton-Voak,[3,6] Andy Skinner,[2,7] Anne Stewart,[8,9] and Helen Bould[1,2,10]

[1]Centre for Academic Mental Health, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK; [2]Medical Research Council Integrative Epidemiology Unit, University of Bristol, Bristol, UK; [3]NIHR Biomedical Research Centre, University Hospitals Bristol and Weston NHS Foundation Trust, University of Bristol, Bristol, UK; [4]Division of Psychiatry, University College London, London, UK; [5]NIHR Applied Research Collaboration West at University Hospitals Bristol and Weston NHS Foundation Trust, Bristol, UK; [6]School of Psychological Science, University of Bristol, Bristol, UK; [7]Integrative Cancer Epidemiology Programme, Bristol Medical School, University of Bristol, Bristol, UK; [8]Department of Psychiatry, University of Oxford, Oxford, UK; [9]Oxford Health NHS Foundation Trust, Oxford, UK; [10]Gloucestershire Health and Care NHS Foundation Trust, Gloucester, UK

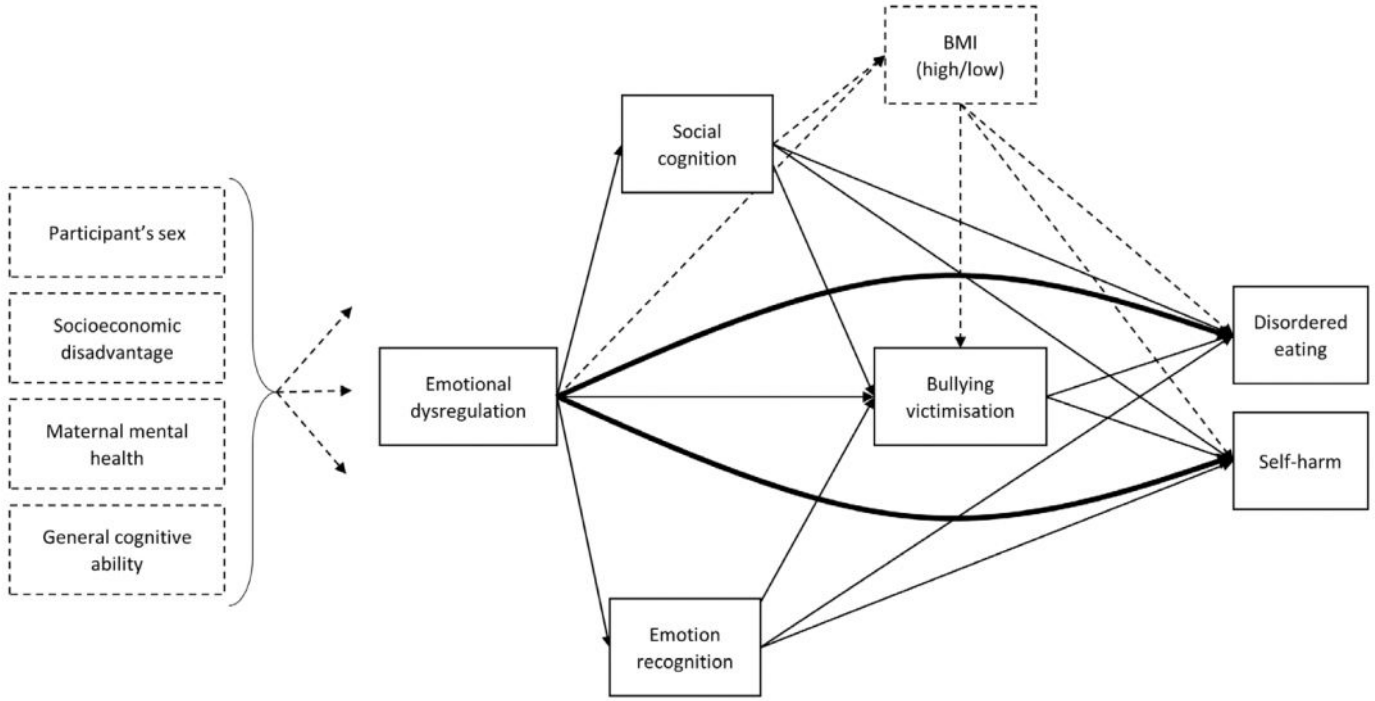
Exploring mechanisms



Findings

- 3,481 girls and 3,453 males
- **51%** of the association between emotion dysregulation and disordered eating **explained by social cognition in girls**, but not boys
- No effect of emotion recognition

Exploring mechanisms



Meaning of findings

- Difficulties in social cognition seem to play an important role in the onset of disordered eating behaviours
- They might explain a large part of the association between emotion dysregulation and disordered eating

Meaning of findings

Home › Journal of Autism and Developmental Disorders › Article

"For Me, the Anorexia is Just a Symptom, and the Cause is the Autism": Investigating Restrictive Eating Disorders in Autistic Women

Original Paper | Open access | Published: 09 April 2020

Volume 50, pages 4280–4296, (2020) Cite this article

Download PDF

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Janina Brede, Charli Babb, Catherine Jones, Mair Elliott, Cathy Zanker, Kate Tchanturia, Lucy Serpell, John Fox & Will Mandy

Table 2 Overview of themes from thematic analysis

Main themes	Subthemes
Sensory sensitivities	Sensory overload
	Food-specific sensory sensitivities
	Internal and bodily sensations
Social interaction and relationships	
Self and identity	
Difficulties with emotions	
Thinking styles	Literal thinking
	Intense interests
	Rigid thinking
Need for control and predictability	

Evidence gaps and future research

- Less evidence on the association between other autistic traits (e.g., repetitive behaviours, difficulties with emotion recognition, sensory sensitivity) both in terms of:
  - Number of studies looking at these associations
  - Evidence of associations in studies that have looked at these associations
- Shared and specific associations?

ARFID – Avoidant and Restrictive Food Intake Disorder

LIMITED INTEREST IN FOOD

SENSORY SENSITIVITY

FEAR OF ADVERSE CONSEQUENCES

ARFID Epidemiology (Sanchez-Cerezo et al, 2023)

Prevalence:

- 5 – 22% in eating disorder services
- 32 – 64% in feeding clinics
- 0.3% - 15.5% in the population

Comorbidity:

- **Anxiety** and **autism spectrum disorder**
- **GI problems**

ARFID – Avoidant and Restrictive Food Intake Disorder

LIMITED INTEREST IN FOOD

SENSORY SENSITIVITY

FEAR OF ADVERSE CONSEQUENCES

Knowledge & Service Gaps

Epidemiology

- How many people have ARFID?
- What are risk factors for ARFID?

Service delivery

- Very few services available in the UK, often for children who are very underweight
- Little known about effective treatment

ARFID – Avoidant and Restrictive Food Intake Disorder

LIMITED INTEREST IN FOOD

SENSORY SENSITIVITY

FEAR OF ADVERSE CONSEQUENCES

Upcoming research

- Co-produced a new ARFID questionnaire with young people with lived experience.
- It is being included in two UK cohorts
  - Born in Bradford/Age of Wonder, this year data on 10-15,000 young people.
  - IMAGINE Study, upcoming, n=5,000 target
- Validation against clinical questionnaire

Concluding remarks

Autism and eating disorders might be very closely linked, but there could be different mechanisms linking different autistic traits to different eating disorder presentations

- **Social communication difficulties** seem to be common to several eating disorder presentations
- **Rigidity, specific interests, repetitive behaviours** are seen in people with anorexia nervosa and autism, but less evidence on longitudinal associations
- **Sensory sensitivity, difficulties perceiving hunger** commonly seen in ARFID, but might also be present in other eating disorders

More research is needed, we need large longitudinal studies to include measures covering these aspects so that we can better study risk pathways.

Acknowledgements

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