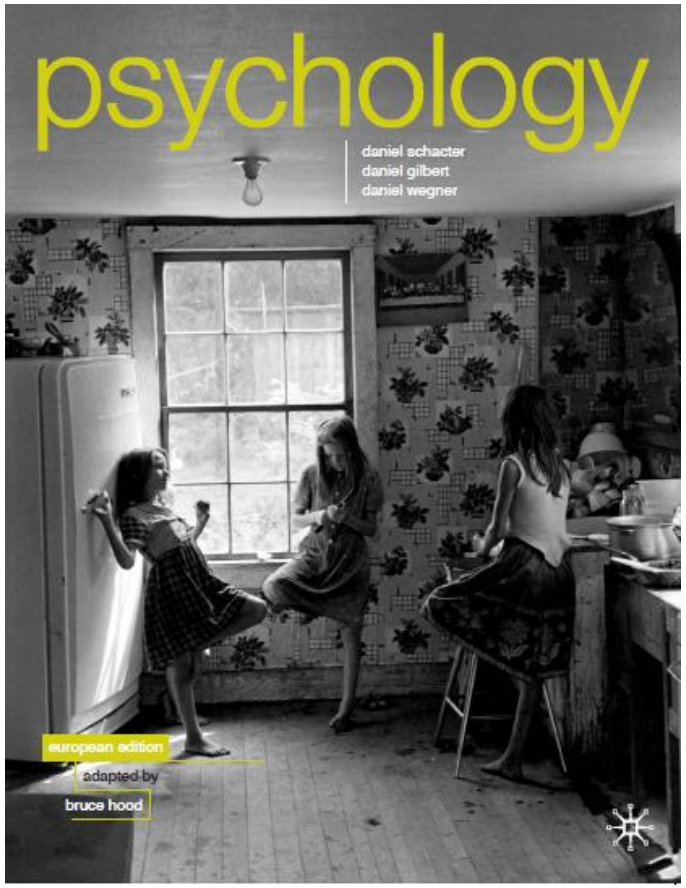


Lecture 12

Neurodevelopmental disorder

reading

Schacter et al. (2011): core text: Chapter 11 (box on ASD)

Slater, A. & Bremner, G. (2008). *An introduction to Developmental Psychology. BPS Blackwell*.
Chapter 21. Atypical Development

plus pdf articles on blackboard if you are interested:

Tager-Flusberg (1997) Evaluating the Theory-of-Mind Hypothesis of Autism, Current Dir in Psych Science

also Happe & Frith (1994)

psychopathology

- via “Diagnostic and Statistical Manual of Mental Disorders – version 5”; diagnostic criteria USA
- imply deviance, distress, dysfunction, danger but we should question ‘abnormal’

e.g. Autism spectrum disorder (ASD): autistic disorder, Asperger’s disorder, childhood disintegrative disorder, pervasive developmental disorder not otherwise specified - “a catch-all”

evidence is critical – how do we identify disorder?

impairment on task ‘A’

Say I invent a task that taps ability ‘A’

Then I find a child who has problems on this task

What does this mean?

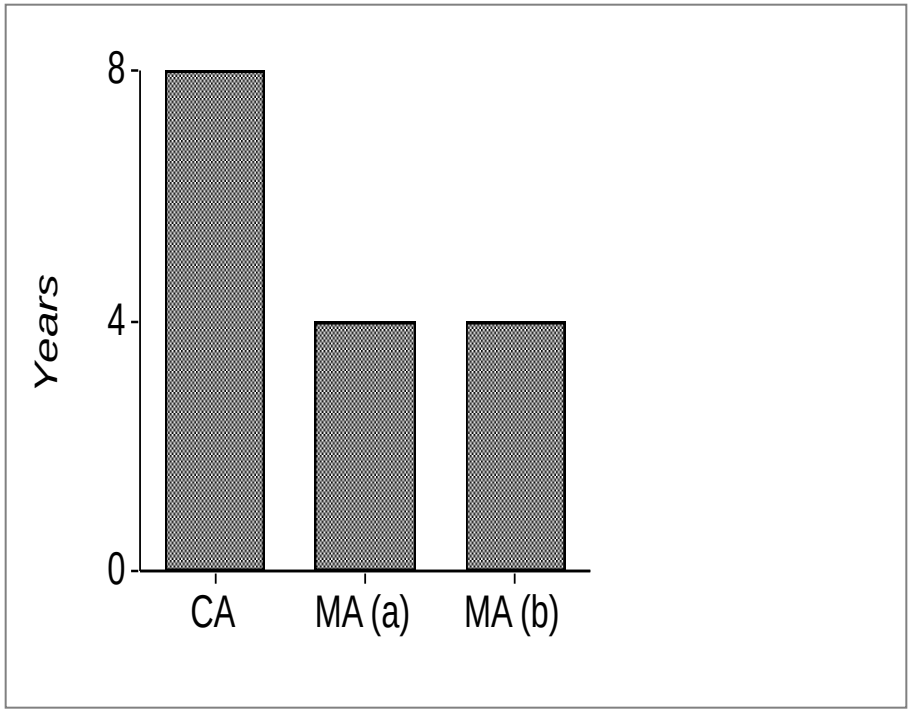
Simply – it means they have impaired ability on task A

OK – but how specific is this to ‘A’?

identifying ‘mental’ age

- chronological age, mental age

(also IQ – the ratio of MA to CA)



example; test A

child obtains raw score 14/40
average 4 yr old also
obtains 14/40
→ mental age of 4 years

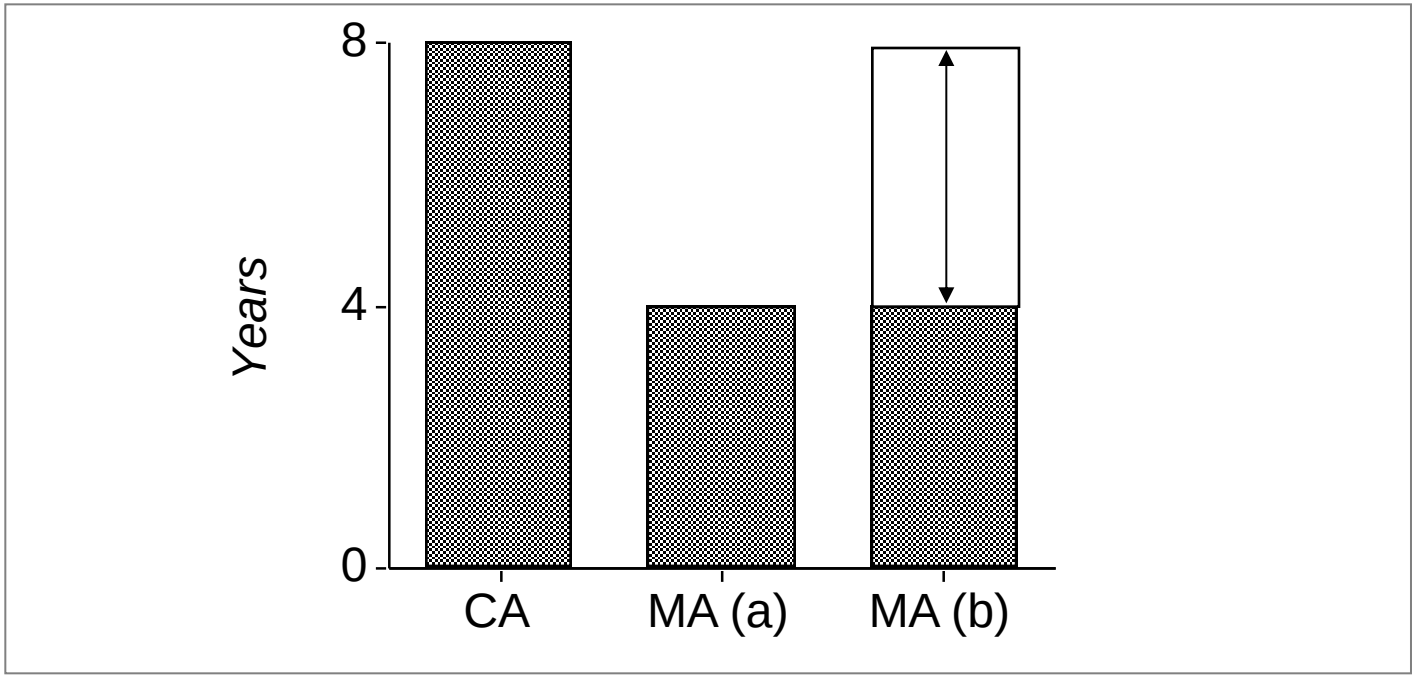
MA/CA = 4/8 = .5 (*100)
IQ = 50

Atypical development of ability being measured by test A

but ‘mental age’ vary by domain

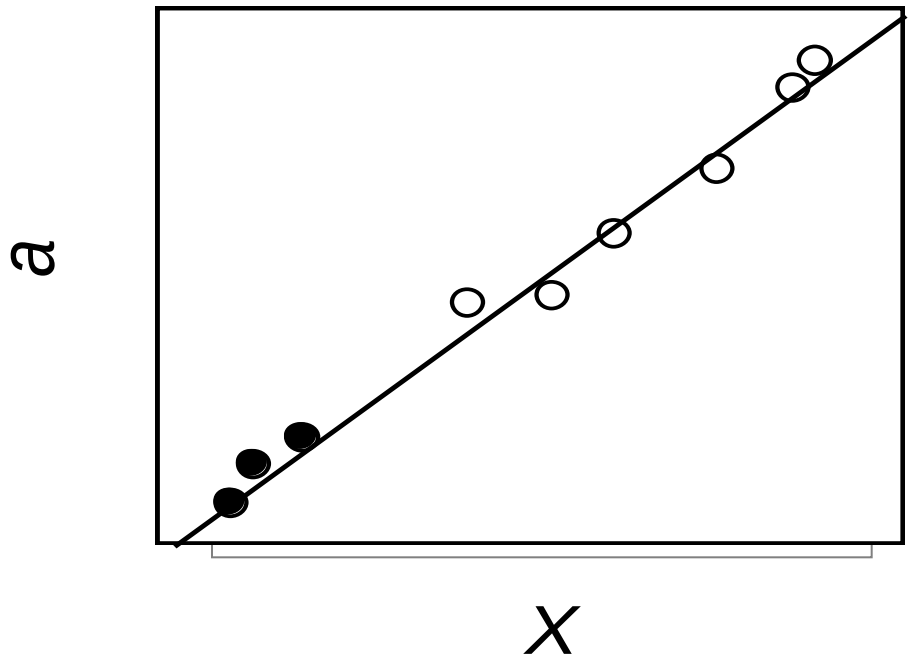
Mental age – can vary systematically across cognitive domains (general learning disability)

But also observe variation between domains (poor language (a) but high social functioning (b)



identifying ‘delay’

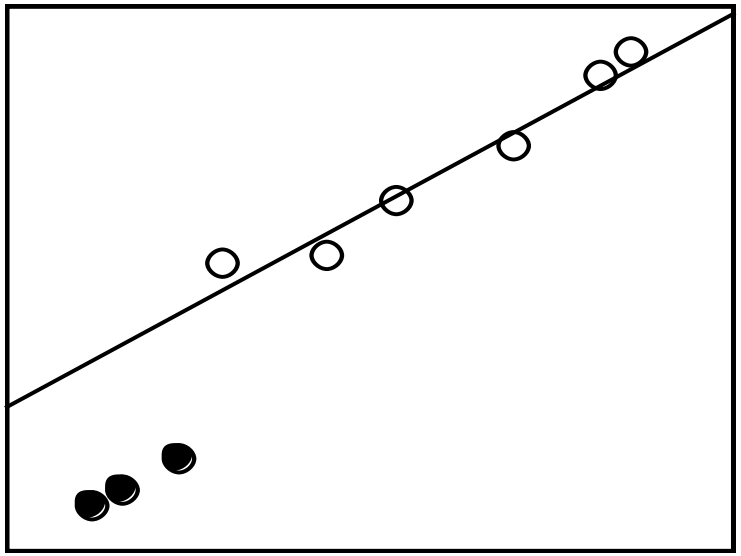
One model of atypical development = delay



If X = age, then performance on Task A is **delayed** with respect to age If X= language, then A correlates with X

identifying ‘deviance’

Looking for another pattern that is ‘atypical’ in relation to peers = deviance



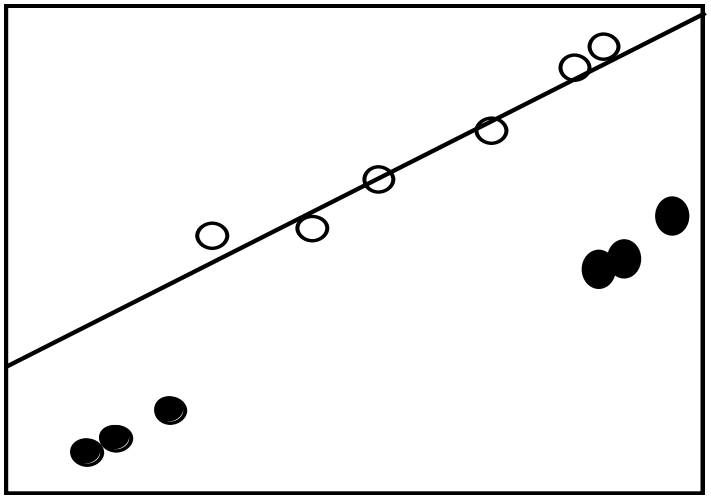
Performance on A is worse ***than expected*** (deviant)

If X is verbal mental ability, Lucy is worse on task A, than expected for verbal mental ability

If X = age, then performance on Task A is **deviant** with respect to age; worse than expected for age

varying patterns of ‘deviance’

But other patterns exist that are ‘atypical’ in relation to peers, also ‘deviance’



Impaired on A even though quite good at X

If X = mental ability, then performance on Task A is **deviant** with respect to mental ability; even though quite good at X

atypical development

For many children observe ‘across the board’ intellectual delay, also certain conditions where development appears ‘deviant’

- Identify greater impairment in one area than another, and deviant pattern in the impaired domain (social function in autism?)
- So - abilities likely to draw on domain-general processes (speed, intelligence), but domain-specificity of impairment can occur

  (spatial abilities in Williams Syndrome)

autistic spectrum disorder

Kanner (1943) – 'autistic aloneness'

Incidence – 4-8/1000 live births

Cause – unclear, but biological link

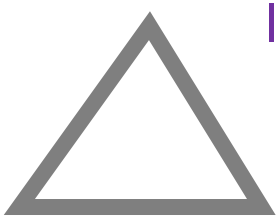
"triad of impairments" Wing & Gould, 1979

reciprocal social interaction

lack of friendships, objectification

verbal and nonverbal communication

1-sided interaction
"pass the salt?" yes.



restricted and repetitive behaviours

insistence on 'same', pretend play

autistic spectrum disorder

Now DSM-V “Autism Spectrum Disorder” (2012)

A. Persistent deficits in social communication and social interaction across multiple contexts

B. Restricted, repetitive patterns of behavior, interests, or activities (2 or more: stereotyped movement, insistence on sameness, fixated interests, hyper/hypo-sensitivity to sensory features)

examples of autistic traits

abnormal social approach

failure of normal back-and-forth conversation

reduced share of interests, emotions, or affect

failure to initiate, or respond to social interactions

maintaining social relations/ lack of interest in peer

poor at making eye contact

poor integration of verbal/nonverbal communication

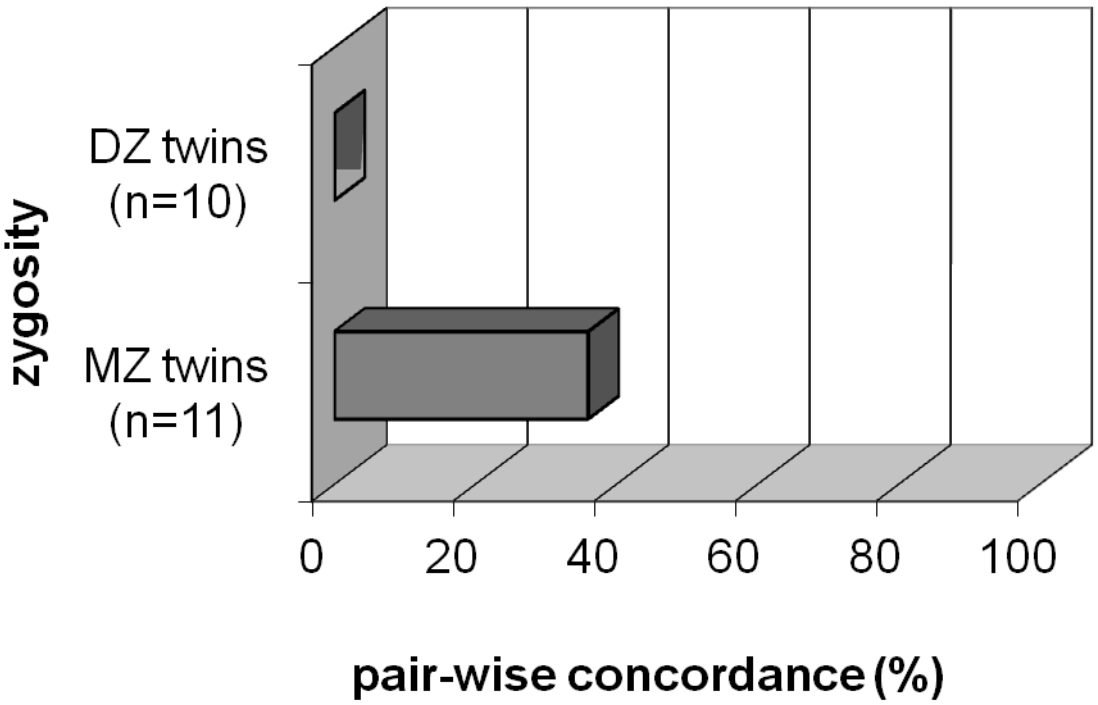
early twin study

MZ twins: genetically identical

DZ twins: share 50% polymorphic genes

is concordance for autism higher in MZ than in DZ twins? Yes

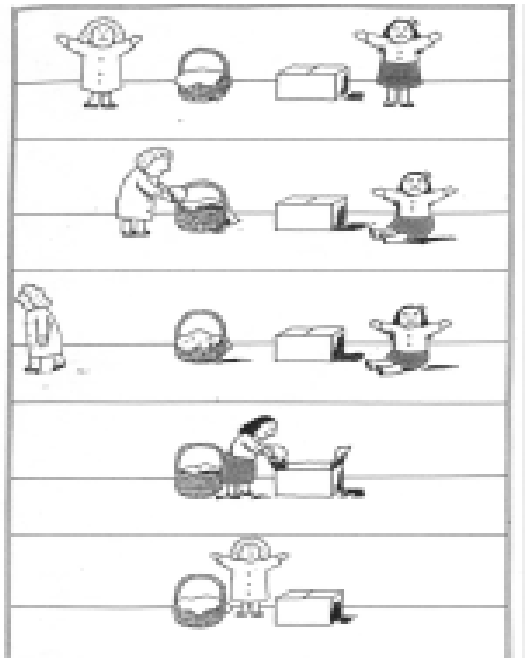
Folstein & Rutter (1977); Bailey et al. (1995)



But genetic risk is probabilistic, not deterministic
Room for compensation & benefit from interventions

explaining ASD

- A “theory of mind” problem – ‘mentalizing’



Correct answer = Sally should look in the basket
If you can identify the protagonist perspective, evidence for attribute ‘thoughts, feelings, emotions’ to other people

Theory of Mind deficit– by comparison?

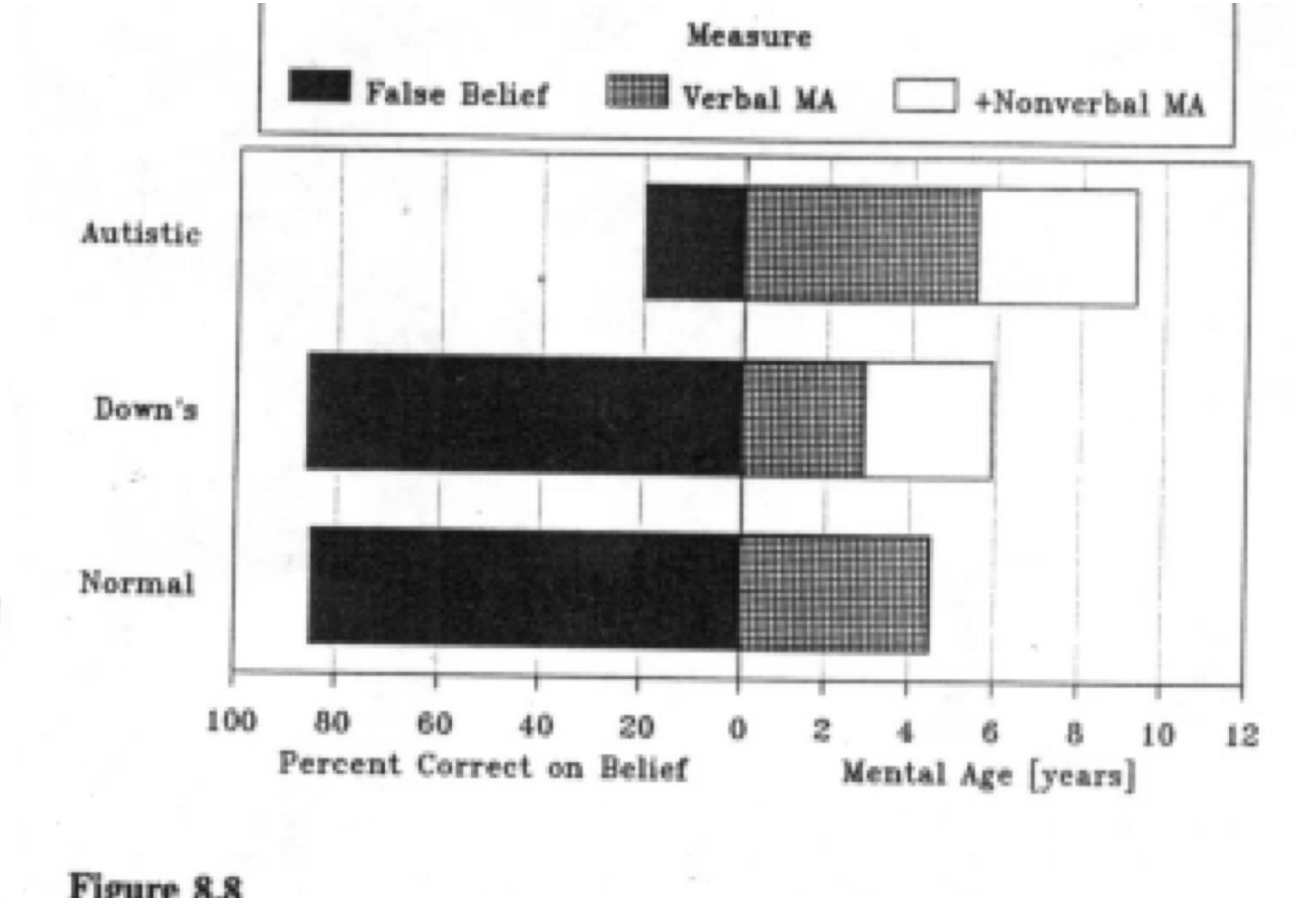


Figure 8.8

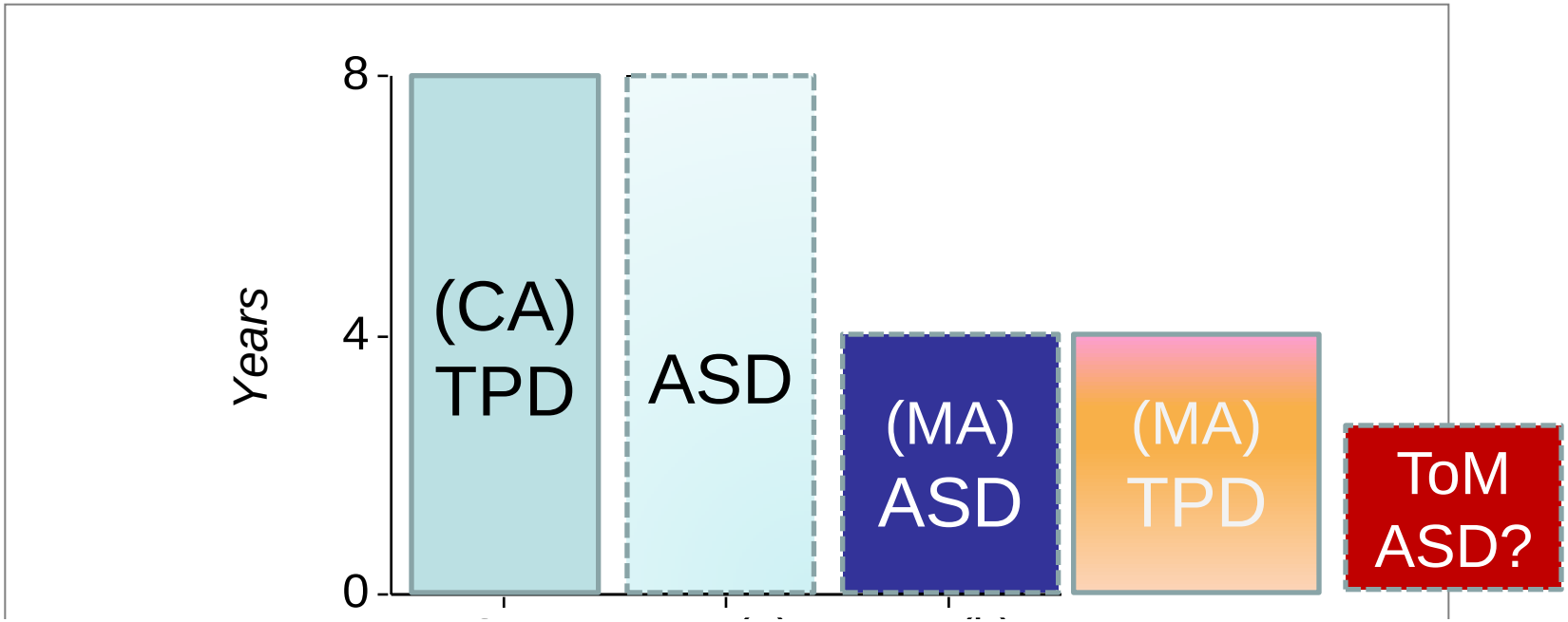
problems on false belief , despite 'sufficient' language

From Baron-Cohen et al. (1985)

control for ‘delay’

compare to **matched** controls – but who?

- TPD matched for same **Chronological Age** (CA-match)
- TPD matched for same **Mental Age** (MA-match)



Now compare ASD on Test A; only MA-match controls for ‘delay’ and identifies ‘deviance’

“mind-blindness”

- Individuals with autism fail to interpret (as) mental states – the actions of self and others as meaningful i.e. relating from desires, feelings, beliefs, reasons
- ‘Reading the Mind in the Eye’ test

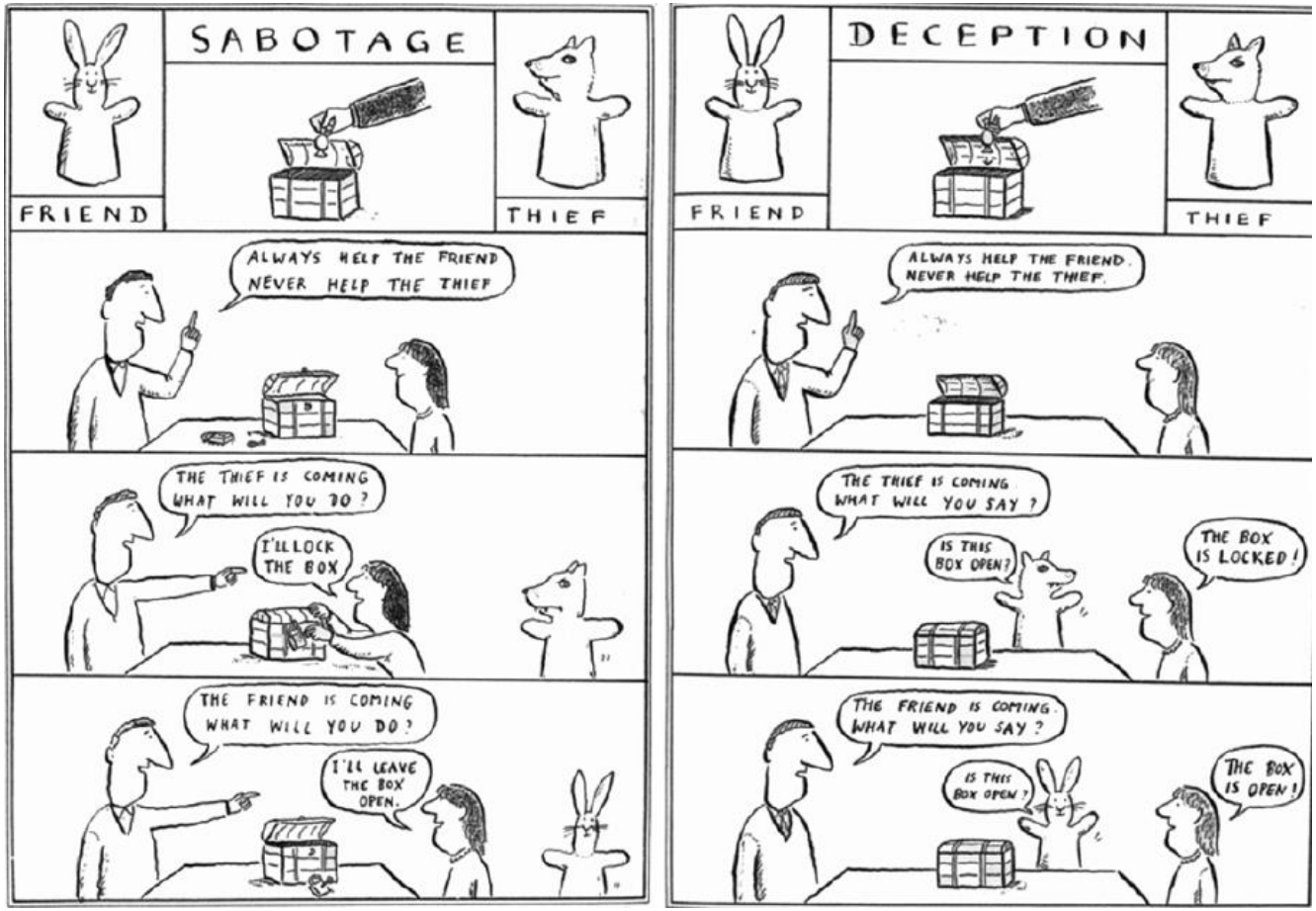
  (Baron-Cohen et al., 2001)

e.g. concerned or unconcerned? : what is this person feeling?

Autistic/ Aspergers Mean **16.3** / 25

Control group Mean = 20.3, Tourettes Mean = 20.4

simply poor at socially relevant judgements?



ASD worse when access contents of other people's minds i.e. intentions on deception task

‘mind-blindness’

Not simply ‘socially-relevant’ behaviour

‘fine cuts along a hidden seam’

Frith & Happé (1998)

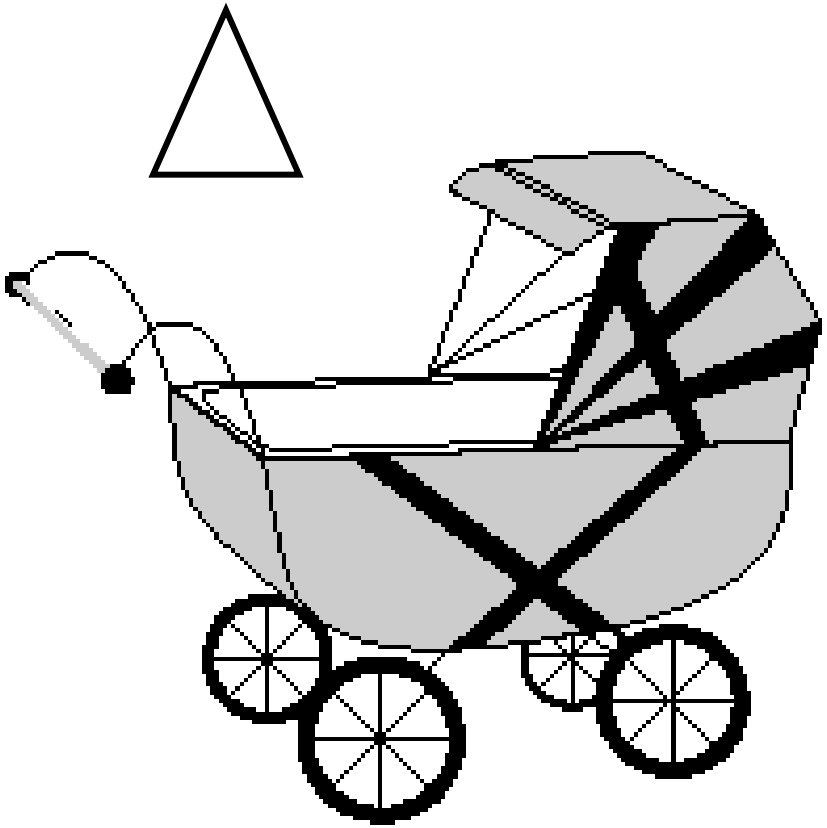
Impaired	*Intact*
deception	sabotage
protodeclarative pointing	protoimperative pointing

ASD – more than ‘mind-blindness’?

islets of ability:

- good rote memory
- good visuospatial skills
- good musical ability
- excellent visual search

and some show exceptional skills in these areas (savant skills)



Frith (2003); Pellicano et al. (2006)

Autism – more than ‘mind-blindness’?

Repetitive interests? Systematizing preference for rule-governed behaviour (Baron-Cohen)

- train timetables
- computers/data
- clocks/ machines

Systematizing behaviour: construct if-then rules – then over-apply rules (males>females)

ASD = *hypersystematizing*

ASD foraging behaviour?

Foraging behaviour in lab

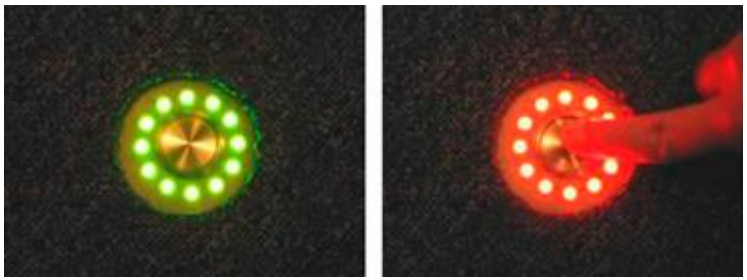
- search for ‘red’ targets
- bias e.g. 80% on RHS

ASD vs controls:

Sensitivity to display bias

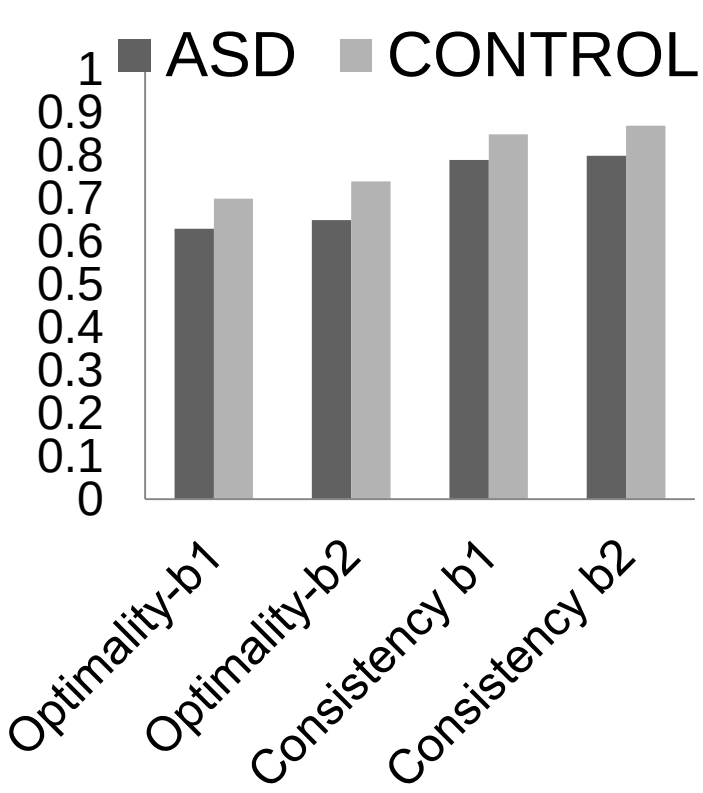
Optimal search in display

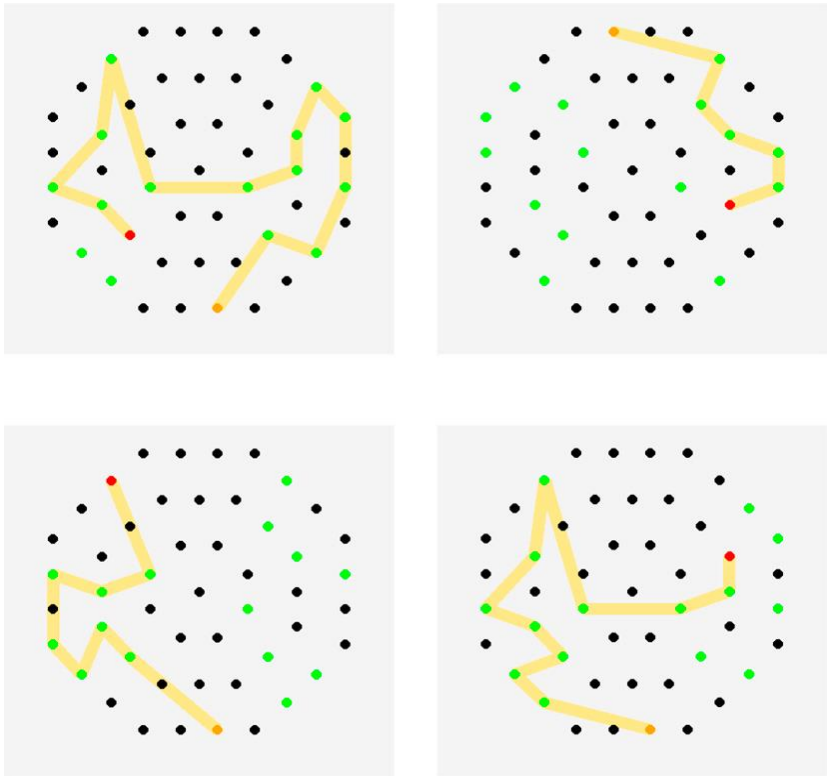
Consistent search in display



Pellicano et al. (2006)

not ‘hypersystematizers’





ASD less optimal and less systematic in search patterns – poor (executive) regulation of behaviour

Autistic Spectrum Disorder

Deficits in social domain are prominent

but ‘mindblindness’ is limited explanation

Need to consider development of social cognition – also possible that more general cognition (executive function) contributes to pattern of deficits in autism

Williams Syndrome: specific impairment - by modality (visual-verbal)

Williams syndrome

Williams et al. (1961)

incidence – about 1/20,000 live births

cause - chromosome 7 deletion

– characteristic facial features
– narrowed arteries
– raised calcium levels

Williams syndrome

- very empathic, over-friendly, less ‘stranger-aware’, affinity for music
- “in Williams syndrome linguistic functions are remarkably and selectively preserved in the face of severe general cognitive deficits”

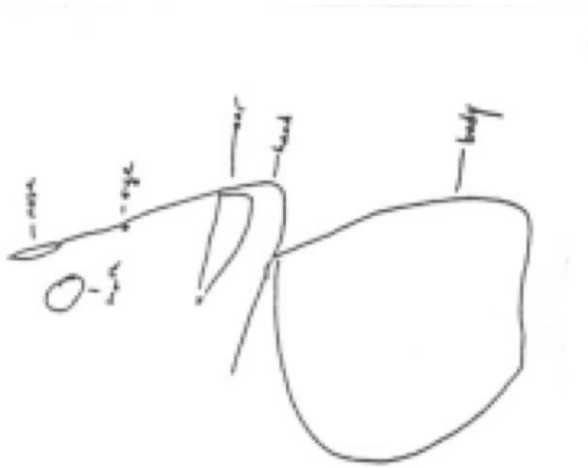
Bellugi & Wang (1998)

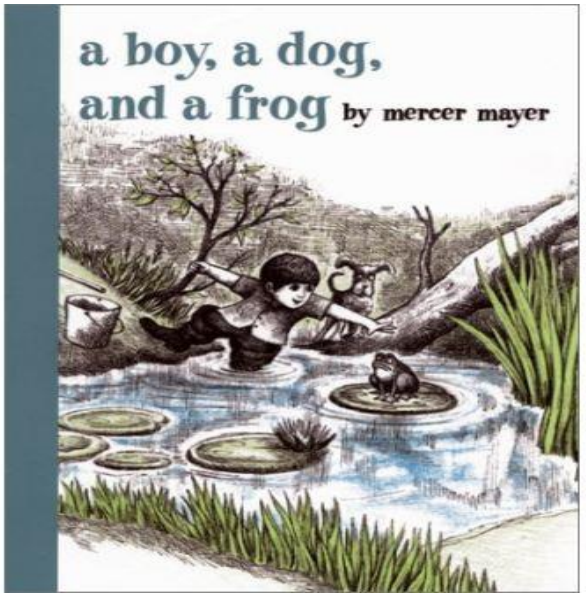
Williams syndrome

- Fluent language: ‘Frog story’ narrative task

  “Lo and behold! They find him … with a lady”

  “Well, what do you know? A frog family! Two lovers”





poor visuo-spatial skills

Williams syndrome

But do the two domains interact?

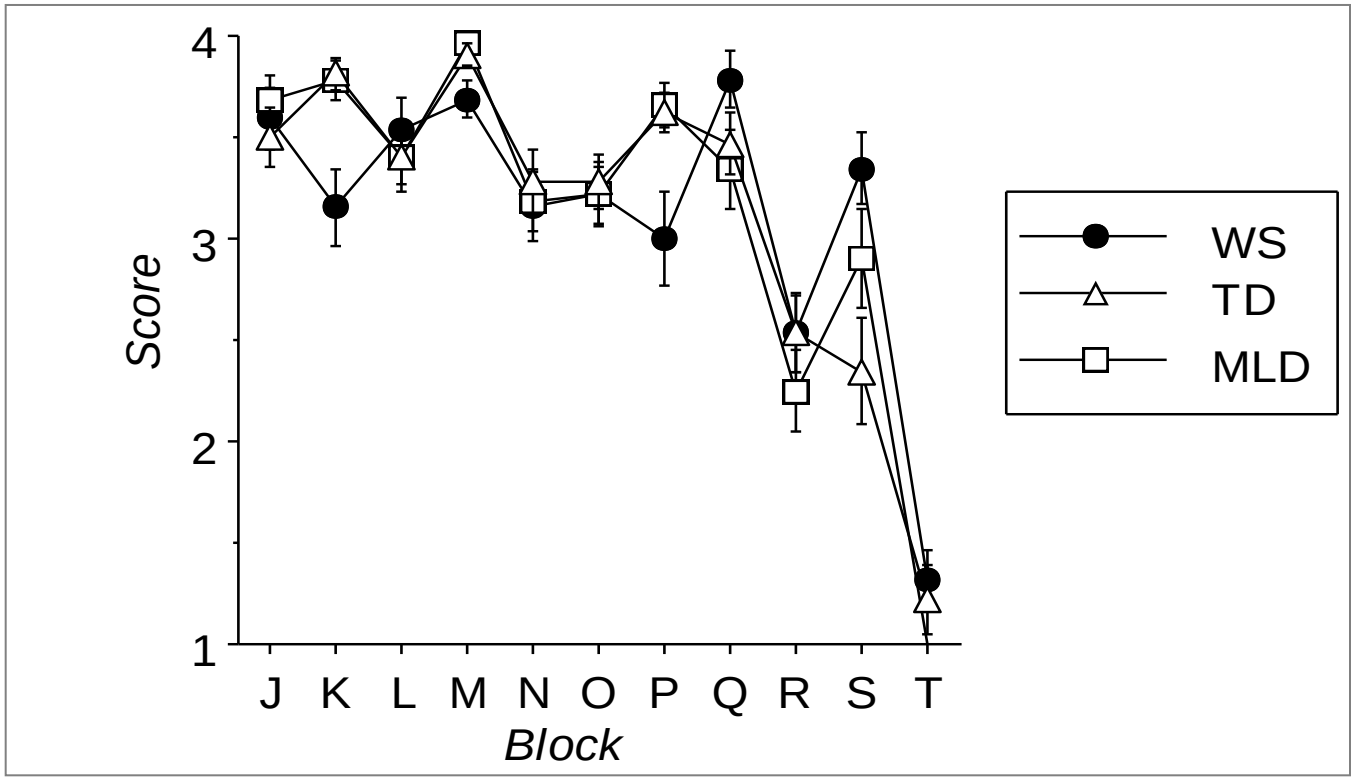
Test language with a spatial component

32 individuals with WS

32 TD and MLD controls

matched for overall score on a standard language comprehension test

spatial language



K longer, bigger, taller; *M in, on*; P above, below

WS individuals deviant pattern on spatial terms

summary

- delay might be most common pattern overall – but important to identify a ‘deviant’ pattern
- atypical development can show ‘selective’ impairments
- e.g. socialization difficulties highlights the ‘fine-cuts’ in cognition; even on similar tasks (deception v sabotage)
- atypical development can inform typical development
- evidence of ‘specificity’ informs wider debate of how to carve up cognition (visual vs verbal?)
- But evidence also suggests cautious approach to theories that ‘sever’ cognition; ‘carving up nature at it’s joints’
- different domains interact in atypical development – important to consider role of domain-general ability (executive function)