

Screening for learning difficulties and co-morbidities

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Behaviour and Learning

- Does disruptive / inattentive behaviour at school 'cause' difficulty learning?
- Is poor educational achievement the 'cause' of disruptive inattentive behaviour?



Behaviour and learning

Important consideration :

Affects whether we focus on

- how to teach a child appropriately or
- whether the child has a 'behaviour problem' that becomes specialist problem needing special services and not in the domain of the classroom teacher



Paediatric consultations

- ❖ 50% behavioural concerns
- ❖ 20% learning difficulties
- ❖ 17% of ALL children have poor progress in literacy
- ❖ 9% of ALL children have concurrent behaviour and literacy problems



Behaviour and learning

Large scale educational research:

- Major effect - disruptive behaviour improves with improvement in literacy
- Small effect – improvement in attentiveness/disruptive behaviour improves literacy outcomes. (Rowe & Rowe Int Journal Ed Research 1999)



What is the role of Paediatricians in assessing learning difficulties?

- Identifying behaviours that can be assisted, to optimize learning eg ADHD
- Identify behaviours that, if understood, can assist teachers in avoiding situations eg children with Asperger's
- Screen for learning difficulties to efficiently target assessments
- Provide teachers with 'useful' information



Observations of how students learn

- How do children learn?
- How do we work out how children with learning difficulties learn best?
- Identifying co-morbid conditions that affect learning.
- What further assessment is needed?
- Implications for teaching.



How children describe a 'good' teacher

- They care about me
- They are enthusiastic about what they are teaching
- They are interested in whether I am learning
- They are fair



Assessing children with learning /behavioural difficulties

- Hearing
- Hearing in noise
- Listening
 - Processing auditory information
 - Concentration
 - Understanding language
 - ESL
 - 'meaning' of words



Auditory Processing Capacity - APC

Auditory processing capacity
is the ability to hold,
sequence and process accurately
what is heard



Literacy, behavior & auditory processing

- ❖ Poor literacy progress, learning difficulties & inattentive behaviours - more than **80%** have problems with **processing auditory information**
- ❖ Usually normal hearing (10% problems with background noise)



Measures of *functional* APC 1

Digit span:

- Surrogate measure of ability to recall short unrelated pieces of information
- less dependent on familiarity with language
- Often used as an indication of **short term auditory memory** and/or **attention**
- It is generally accepted that children with an auditory capacity of 4-5 'chunks' (e.g., phonemes) develop reading skills more easily



Measures of *functional* APC 2

Sentence length:

Also lacks reliable norms, but used as a surrogate measure for the **quantity** of information able to be recalled - dependent on:

- Familiarity with language
- Developmental age
- Ability to listen, concentrate
- Intelligence & its normal variation
- Ability to process verbal information in the brain (*central auditory processing*)



Key features of AP difficulties 1

Developmental

- Most common specific processing difficulty
- Ability increases between ages 3-15 years, but not at the rate commonly thought
- 20% of ALL children do not progress at the rate one would expect, and are at high risk of **difficulties with learning** and **externalizing behaviour problems**



Key features of AP difficulties 2

As a **functional** problem, AP can be an:

- ❖ isolated difficulty with normal intelligence
- ❖ associated with attention deficit behaviours (ADD/ADHD)
- ❖ speech and language difficulties
- ❖ mild intellectual disability
- ❖ ESL background



Key features of AP difficulties 3

Delay in capacity is evidenced by:

- difficulty following directions
- appear to: 'not hear', 'not listen', 'not concentrate' (*inattentiveness*)
- difficulty recalling verbal information including retaining phonemes



Key features of AP capacity

- The rate and ability to process auditory information improves with time; i.e., it is **developmental**
- 'Delay' presents as a **functional** *listening* and *processing* problem (not a diagnosis)
- Requires changes in the way information is presented



Consequences for children

- If adjustments are not made, children (especially boys) miss a lot of **basic** information
- Children assume that they are 'dumb' and lose confidence
- Children often develop significant behavior problems because they don't understand **why** they are in 'trouble'



AP implications for pedagogy 1

Auditory Processing and its development have implications for:

- understanding instructions
- learning new concepts
- reading, writing and spelling
- expressive language
- behaviour / peer group relations



AP implications for pedagogy 2

- Since children do not develop *auditory processing capacity* at the assumed rate, many are 'gulping for air' in a sea of classroom- & teacher-generated **blah, blah, blah**
- This **blah** impacts negatively on their *literacy* and general achievement progress, and on their behaviors

(Edwards, 2000; Rowe *et al.*, 2000, 2001, 2002)



Sentence examples 1

- **7-Word:** I heard him talking to the driver
- **8-Word:** The old lady made some tea for everyone
- **8-Word:** Some boys are playing games in the library
- **9-Word:** The green bus is late and he is worried
- **9-Word:** My class is making banana cake for the party



Sentence examples 2

- **10-Word:** Put your rubbish in the black box behind the table
- **11-Word:** Her brother wrote on the card but forgot to post it
- **12-Word:** After the train driver blows his whistle he drives off very fast
- **14-Word:** My best friend lost her new watch while she was walking down the street



Classroom strategies 1

- Attract the child's attention
- Use short sentences (chunk)
- PAUSE between sentences
- Maintain eye contact & wait for compliance
- Set up routines
- For repeats, restate simply & slowly

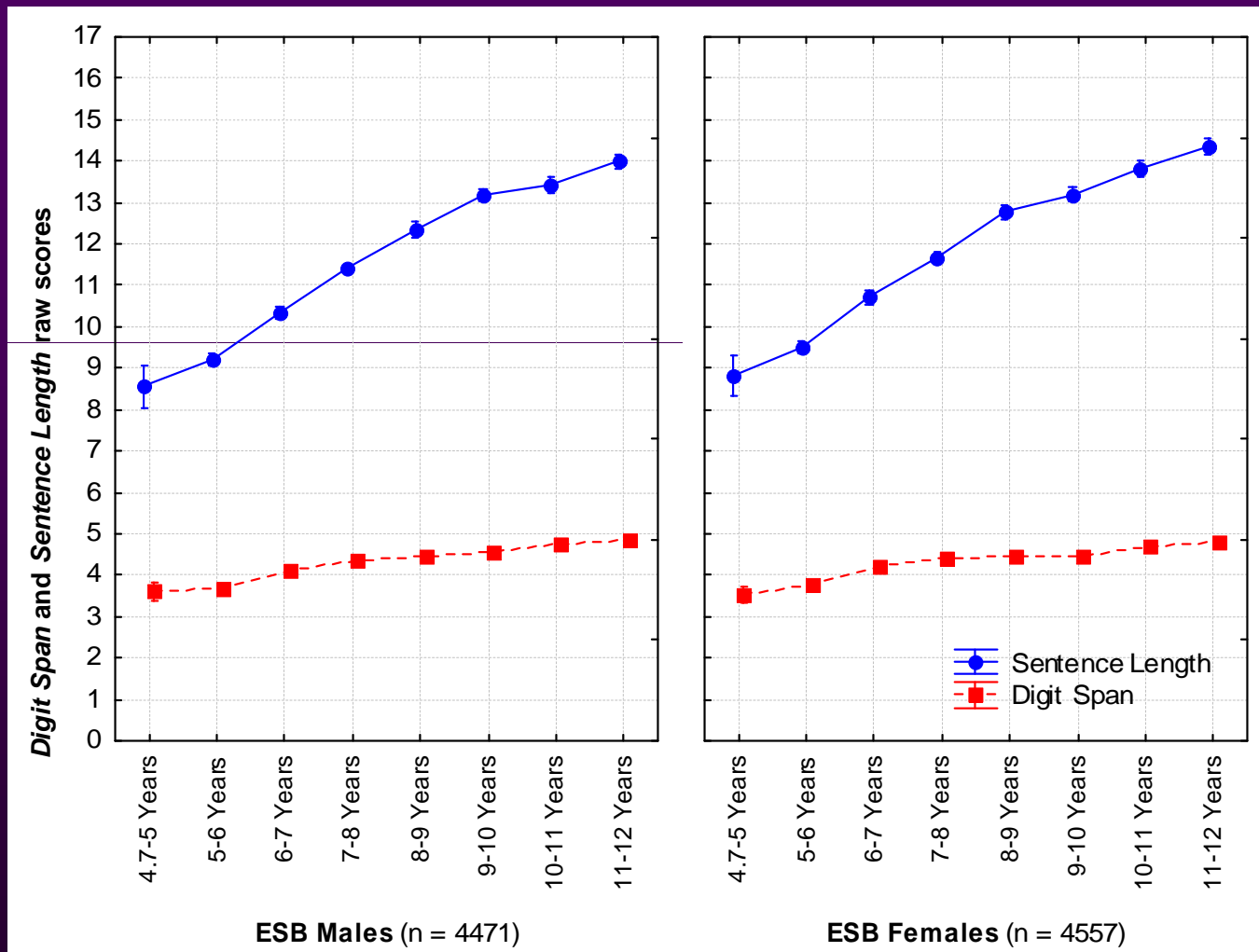


Classroom strategies 2

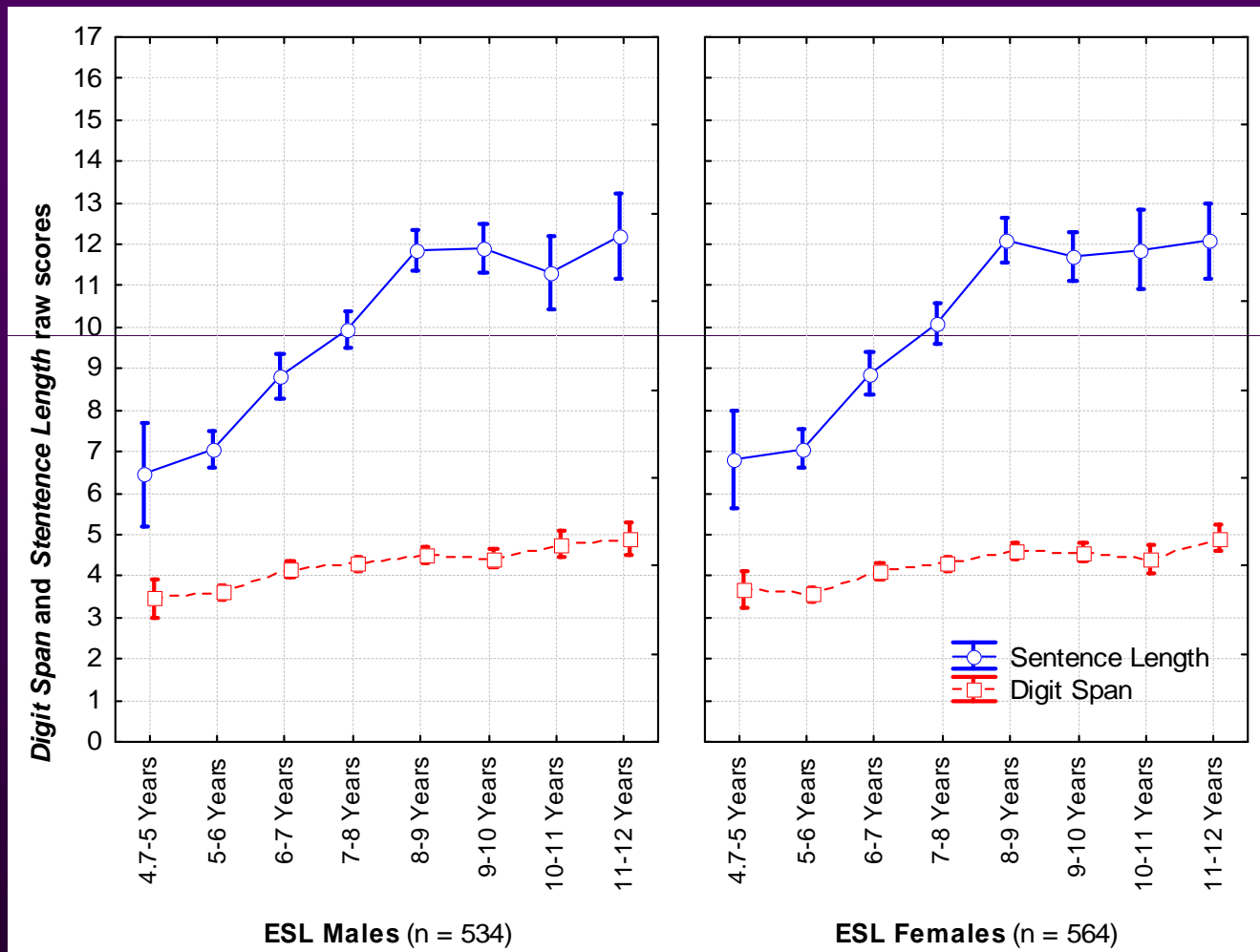
- Use visual cues
- Monitor the child
- If 'BLANK' look, stop and start again
- Improve self-esteem



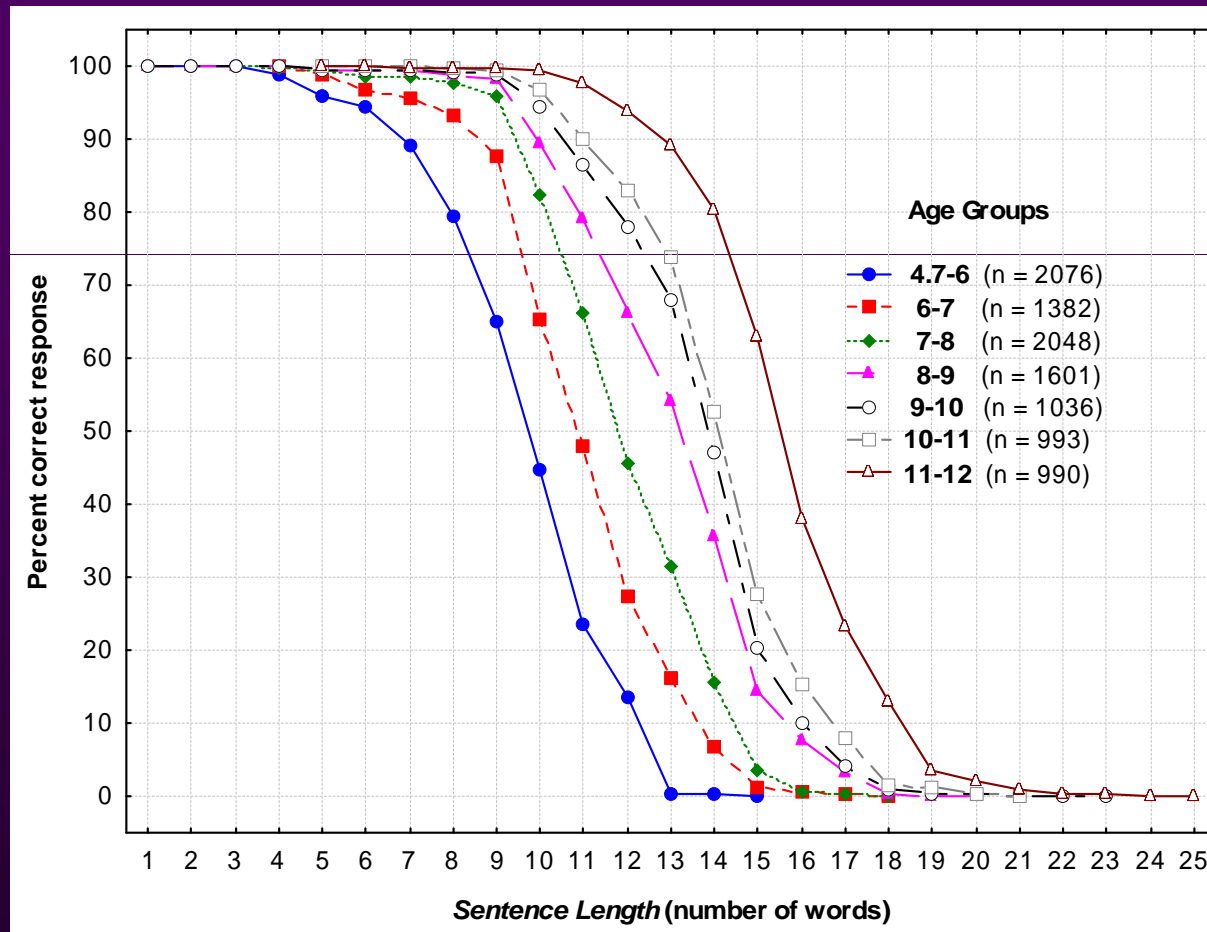
Digit Span & Sentence Length: ESB



Digit Span & Sentence Length: ESL



Percent of children (aged 5-12) who correctly recall sentences of different lengths



Key findings 2

- 5-6 Years: 4 digits, 9 words
- 6-7 Years: 4 digits, 10 words
- 7-8 Years: 4 digits, 11 words
- 8-9 Years: 4 digits, 13 words
- 9-10 Years: 4 digits, 13 words
- 10-11 Years: 5 digits, 14 words
- 11-12 Years: 5 digits, 14 words



Behaviour implications

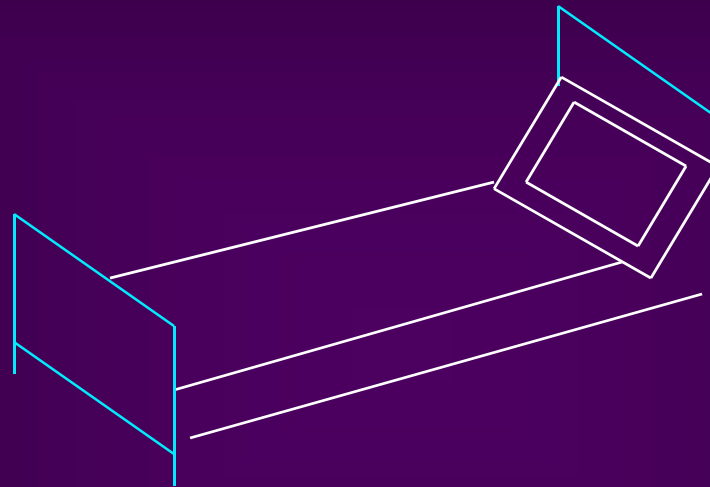
- Teacher awareness & intervention strategies have strong positive effects on *Attentiveness* in the classroom - especially for **boys**
- Without such awareness and intervention, boys' attentive behaviours decline



Visual

- Need to be able to see
 - Distance
 - Close up
- Need to be able to see the 'big picture'
 - Not just parts of puzzle
 - Problem for children with Aspergers





“ravioli”

Child with Asperger’s describing the pillow – difficulty seeing the context



Visual

- Need to be able to see detail
 - Children with ADHD
- Need to be able to see in sequence
 - Visual span
 - Amount can be seen (similar to auditory processing)
 - Often leave the 'ends' off words
 - "the word has to be 'green' because it's the first word on the list and it starts with 'g'"



Visual

- Need to be able to sequence, order information and know direction of letters

6 9

b d q p

m w

u n h y p

men

new



A chair ..is a chair... is a chair
...is a chair



bat

to

to

bat

A 9 year old boy writing 'bat'



Motor & sensory learning

- Usually takes many more practices
 - Writing, tracing out letters on child's back
 - Link motor or sensory activity with either visual or auditory (or both) to reinforce eg spelling new words: look at the word, find letters on tiles, sequence tiles, say word phonetically, write it down
 - Use different textures and colours
 - Linking with pictures



Observations of a child

Ask to read book that they can manage.

- Indication of level
- letter and word reversals, vertical 'flips'
- leaving off ends of words
- Ability to decode unfamiliar words
- Can they recognize complex words but miss detail of common words?



Observations of a child

- Asking to write a brief sentence
 - Phonetic spelling
 - Letter or word reversals
 - Problems with words of a particular length
 - Inappropriate inclusion of recently learned phonemes
 - Sequencing and visual perceptual
 - píd píg saud sand



Observations of children

- Assess auditory processing (digit span and sentence length)
- Complete a jigsaw or block pattern
 - Whole picture from parts
 - Notice visual detail
 - Spatial orientation
 - Organizational skills



- Middle school children
 - Ask to tell time
 - Change from \$1
 - Look up name in the phone bookCheck on examples of schoolwork.



Educational assessments

Can be done by teachers:

- Progressive achievement tests (PAT maths, spelling, reading, comprehension, vocabulary)
 - Same metric from school entry to year 11
 - ‘Diagnostic’ as well as providing norms and comparison with state and national standards



Behavioural ratings

Parent and Teacher ratings

- Conner's
- Rowe Behavioural Rating Inventory



Learning new skills

- Children's brains are 'plastic'. They are still growing and developing and can form new pathways to 'get around' problem areas.
- If one modality is not working well, link it with another that is, and the skill can be learnt



'Availability' to learn

- Distress
- Sense of failure
- Anxiety
- Unwillingness to take risks
- Distractibility, concentration
- Interest
- Social interactions (for whatever reason)
- Whether they can work better by themselves or in a group



No two children learn the same way even with the same diagnosis

- There are often common features for children with:
 - ADHD
 - Aspergers
 - Dyslexia



Co-morbid conditions- ADHD - implications for teachers

- Distractible - visual, auditory, motor social – working alone
- Concentration- frequent changes in activity to keep interest: 'overlearning' inappropriate unless variety
- check whether they know what they are meant to be doing



ADHD

- Check whether they can sequence information – may need to teach strategies
- Check whether they are 'overloaded'
- Usually like gratification closely linked to what doing ie 'bribery and corruption' works well



Aspergers – implications for teachers

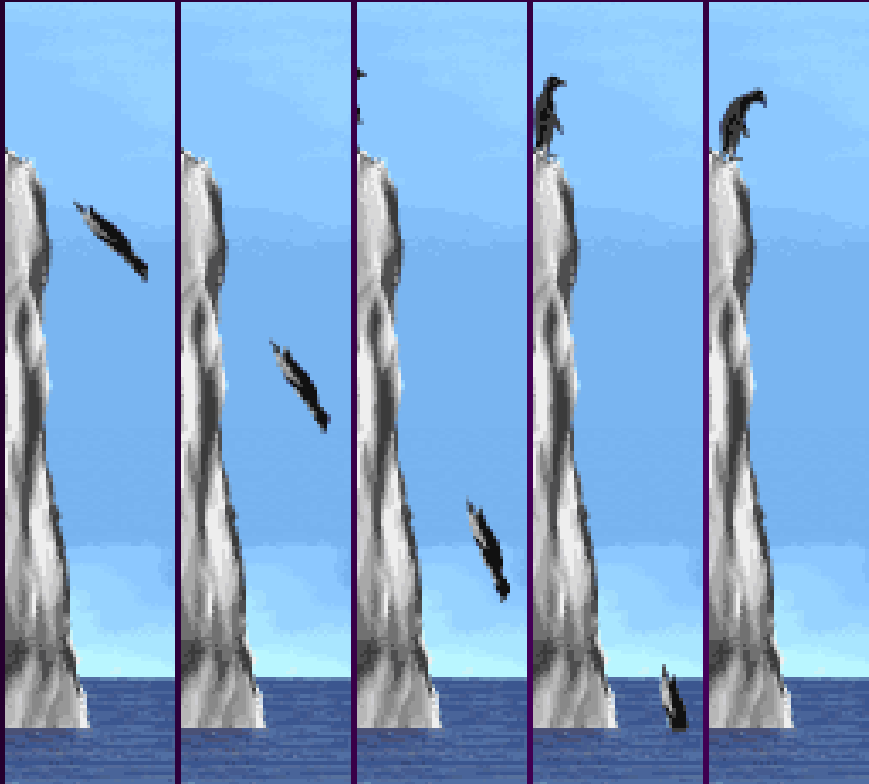
- Subtleties of language – how clear and literal do directions need to be?
- Difficulty with the 'big picture' or context?
- Prefer working alone or 'pace' themselves?
- Difficulty with seeing something from another person's point of view?



Aspergers – implications for teaching

- 'Factual' story writing? Always on current topic of interest?
- Doesn't pick up on social cues?
- Conversation out of context?
- Persist with their topic 'til the bitter end?
- Very unambiguous instructions needed





If you want a penguin to get from one island to the next don't insist that they fly just because they are birds. They can 'fly' but it is under water.

Decide whether 'getting there' is more important than how they get there





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References:

- Rowe KJ, Rowe KS. Investigating the relationship between students' attentive-inattentive behaviors in the classroom and their literacy progress. *International Journal of Educational Research (monograph)*. 1999; 31(1/2): 1-138 (whole issue).
- Rowe KS. Teachers observations of how children learn. In *Working out What Works DEST Effective Third Wave Teaching Practice Ed. Hoad K-A. Revised Edition: ACER, : 2007, pp 41-50*

Web site information

- The **Auditory Processing Assessment Kit** can be ordered from:
<http://www.auditoryprocessingkit.com.au>

