




Evidence for the benefits of full inclusion for children with Down syndrome

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The Down Syndrome Educational Trust

- The Trust exists to advance the education and development of individuals with Down syndrome worldwide through research, information and support.
- Since 1980, we have had an active programme of research and provided services to children, families and schools.
- This has enabled our team of psychologists to work directly with children in early intervention and in classrooms, as well as collect research data.

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- This mix of focused research interests and direct involvement in education has given us a unique opportunity to set up interventions and then follow children in longitudinal studies, as well as ask more experimental research questions.
- We give high priority to sharing information directly with parents and practitioners through publishing, website and training activities.
- For more information see www.downsed.org

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Evaluating educational outcomes?

- What are the educational needs of children with Down syndrome?
- Designing educational programmes to meet needs – evidence-based practice
- Evaluating the outcomes
- Comparing the outcomes for special education classrooms and fully inclusive classrooms

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The effect of Down syndrome on development?

- Not just a pattern of global delay
- a specific profile of learning *strengths* and *difficulties*
- These specific learning *strengths* and *difficulties* are increasingly well understood
- The children's *difficulties* can be addressed with effective interventions
- The children's *strengths* can be used to support learning

5

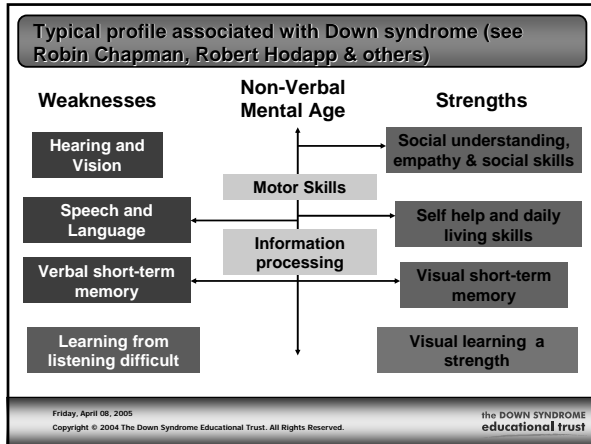
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Development is a dynamic process

- Development is NOT fixed at birth
- Brains are affected by input and activity
- Development is a social, interactive process – influenced by the quality of social relationships, social opportunities and learning environments
- Inclusion - in the family, in the community and in the school - is essential for optimal progress
- We can all make a difference
- INCLUSION PLUS FOCUSED INTERVENTIONS

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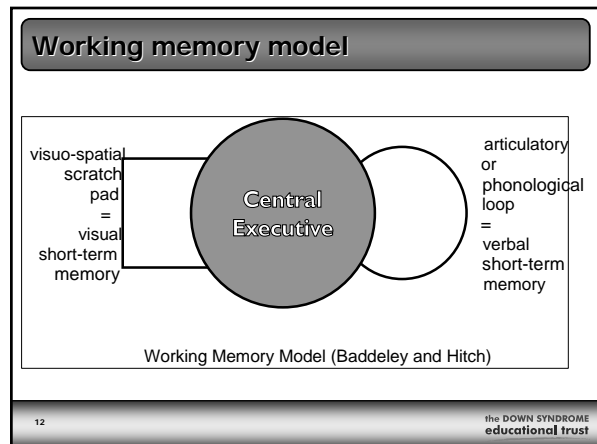
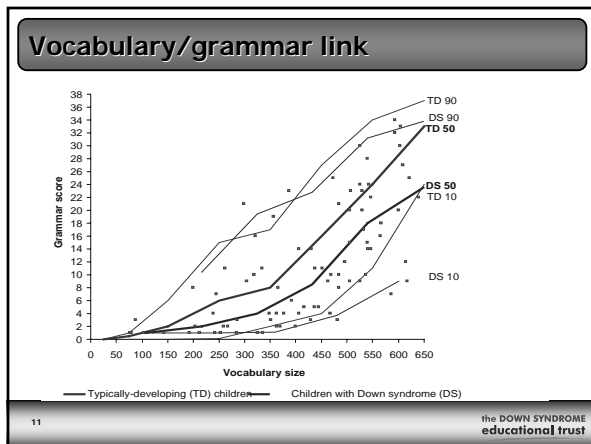
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- ### Speech and language profile for children with Down syndrome
- Language delayed but an uneven profile
 - Communication skills usually good
 - Vocabulary delayed but grows steadily
 - understanding ahead of expression
 - Grammar more difficult – telegraphic talkers
 - understanding ahead of expression
 - Clear speech more difficult
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- ### The importance of speech and language
- Words for knowledge – vocabulary size
 - Language for remembering, thinking, reasoning
 - Language for self-control and planning
 - Language for dealing with emotions and worries
 - Language for communicating with others
 - Language for friendships
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- ### Improving speech and language
- Need to work on all aspects
 - Speech clarity
 - Vocabulary
 - Grammar
 - Communication
 - Use our checklists plus observation diary for assessment and planning
 - Progress with grammar is linked to total vocabulary size
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Working memory

- Working memory is the immediate memory system that supports all mental activity
- Working memory has two stores one for visual/spatial information and one for spoken information –
- These stores hold information for about 2 seconds
- Short-term verbal memory span improves with age and can be estimated with digit tasks

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Working memory - development

- 4 year old children have a digit span of 3, 16 year olds a span of about 6/7, teenagers with Down syndrome only have spans of 2/4
- For children with Down syndrome - their visual spans are better than their verbal spans
- In typical development, span is influenced by increases in speech perception and production rates and by reading ability
- Reading ability, speech and language knowledge and memory development are interactive, gains in one produce gains in another

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Working memory is important for all children 1

- 'Working memory is the mental workplace in which information can be temporarily stored and manipulated during complex everyday activities such as understanding language and doing mental arithmetic'.
- listening to another speaker
- decoding an unfamiliar word whilst holding the meaning of the previously decoded text in mind
- writing while formulating the next part of the text
- engaging in mental arithmetic

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Working memory is important for all children 2

- 'Any task where the child is required to process new information and to integrate it with stored knowledge – learned or just encountered'.
- Children in reception classes with poor working memory measures for age scored poorly later in the Standard Achievement Tests.
- Gathercole, S., & Pickering, S. (2001) Working memory deficits in children with SEN. *British Journal of Special Education*, 28, 2, 89-97.
- Children's Working Memory Battery. Psychological Corporation.

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Keys to successful interventions 1

- **The children are Visual Learners**
- *Learning from listening* will be specially difficult but *learning from looking easier* so always use visual supports – signing, pictures, reading, the computer
- Target speech and language difficulties from infancy and through school years
- Use *reading to teach talking* from early (2 to 3 years)

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Keys to successful interventions

- Address working memory difficulties with memory training, with visual supports for learning and with visual prompt lists and timetables
- Enable knowledge to be demonstrated without the need to say it – choosing, pointing, selecting
- Encourage age-appropriate social behaviour from early – with other children as good role models
- Ensure warm, supportive relationships and environment

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The benefits of teaching reading 1

- Learning from listening is difficult for them and learning from looking is easier
- Printed words seem easier to remember than spoken words
- Reading activities can teach new vocabulary and new grammar
- Reading supports spoken practice of words and sentences
- 'Teaching reading to teach talking'

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The benefits of teaching reading 2

- Spelling and phonics support the development of articulation and phonology so improve speech intelligibility
- Research studies show that teaching reading improves speech, language and working memory skills
- Children do not need to be independent readers to gain these benefits – supported reading will produce at least some of the gains

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Inclusion study – Portsmouth UK

- Compared achievements of all teenagers with Down syndrome in 1987 and in 2000 in one county
- In 1987 – all in special education classrooms
- In 1999 – about one-third full inclusion from 5 yrs
- Compared special class and full inclusion outcomes with carefully matched groups
- One area of county included children from 1988, earlier than the rest of the county
- No difference in ability or social background at 5

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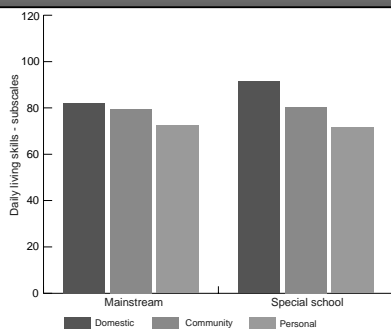
The benefits of inclusion in school

- No progress 1988-2000 for special class outcomes
- Significant educational benefits for inclusion
- Teenagers fully included in mainstream classes
 - gains of more than 2 years in spoken language skills and 3 years in reading and writing
 - gains in maths, general knowledge and in social independence
 - no differences in personal independence or social contacts out of school
 - tend to have better behaviour

22

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Daily living skills – inclusion study

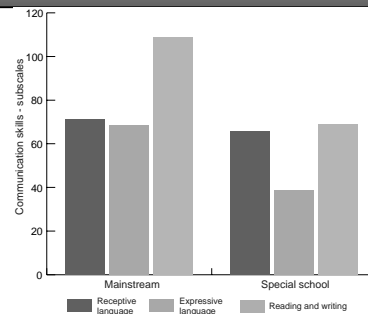


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Communication skills – inclusion study

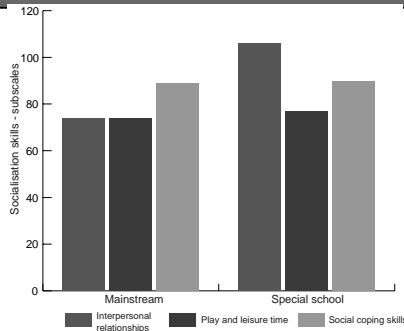


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Socialisation skills – inclusion study

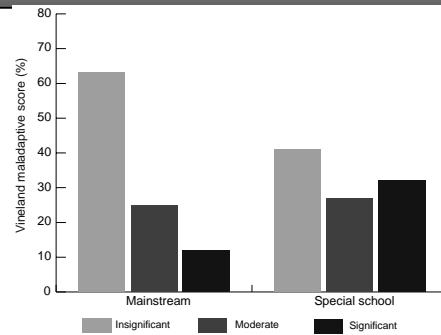


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Difficult behaviours – inclusion study

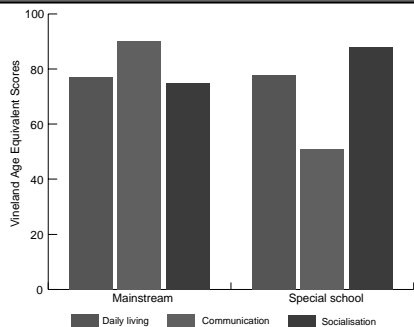


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Comparing across skills – inclusion study



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Closing the language/non-verbal MA gap

- The final slide demonstrates that it is possible to improve the speech, language and literacy skills of children with Down syndrome and bring them in line with their other skills.
- The immersion in mainstream classrooms and the resulting immersion in reading activities may explain this gain – even for non-readers
- These results support the view that speech and language is held back by hearing and auditory processing difficulties – print makes the language visual

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Further reading

- Education for individuals with Down syndrome – an overview – see details in the Down Syndrome Issues and Information Development and Education series see www.downsed.org
- Sue Buckley, Gillian Bird, Ben Sacks & Tamsin Archer (2002) *A comparison of mainstream and special education for teenagers with Down syndrome: Implications for parents and teachers*. Down Syndrome News and Update 2 (2) 46-53. and on website www.down-syndrome.info
- in 2005 **Spanish** versions available

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References to reading research studies

- For a review of the literature on reading in children and adults and all references to our research studies see this chapter:-
- Buckley, S. (2002) Literature and language in J. Rondal & S. Buckley (Eds.) *Speech and language intervention for children with Down syndrome*. London: Whurr.
- See research papers on our inclusion, reading and memory studies on Trust information website www.down-syndrome.info

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