Down Syndrome Education Conferences

Speech-Language Track
Ages 0-6

down syndrome education international
discovering potential • transforming lives

high quality, evidence-based guidance and information for professionals and families

Thank you to our conference sponsors!

DSG
Down Syndrome Guild of Greater Kansas City
When all you see is Down syndrome, you’re not seeing the whole picture!

The Down Syndrome Guild of Greater Kansas City (DSG) is a nonprofit organization whose mission is to provide support and resources to individuals with Down syndrome, their families and the professionals who serve them. DSG seeks to provide the entire community with information and education to broaden awareness and foster positive attitudes regarding people with Down syndrome.

We are so proud to be celebrating our 30th anniversary in 2014. DSG has been a part of some amazing advancements for people with Down syndrome during the last 30 years. Early intervention therapy, inclusive education, community integration and medical advancements mean longer lives and greater opportunities for our friends to achieve their full potential. DSG is so grateful for our partnerships with hospitals, schools, therapy centers, community centers, corporations and funders which allow us to dream big for the next 30 years.

Our 1200 members with Down syndrome invite you to join DSG and help us create a more inclusive world by offering your support in the following ways:

- Volunteer for the DSG
- Host a Dress Down for Down Syndrome Day
- Sponsor an event
- Hire an employee with Down syndrome
- Collect items for our new parent baskets

With your help, we can achieve great things!

For more information: www.kcdsg.org | 913-384-4848 | info@kcdsg.org
This track offers information and practical advice about the speech and language learning development and needs of children and young people with Down syndrome. This unique opportunity will provide you evidence based information, advice and guidance drawing on the latest scientific research that will assist you in working with your clients who have Down syndrome.

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<thead>
<tr>
<th>Time</th>
<th>Early Years Track (0-6 Years)</th>
<th>Childhood Track (7-16 Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 AM - 8:00 AM</td>
<td>Registration</td>
<td>Continental Breakfast (included with registration fee)</td>
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<tr>
<td>8:00 AM - 9:00 AM</td>
<td>Keynote – What does research tell us about the speech and language profile of individuals with Down syndrome and the design of effective therapies?</td>
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<tr>
<td>9:15 AM - 10:00 AM</td>
<td>Developing early language—vocabulary and grammar</td>
<td>Developing and supporting working memory</td>
</tr>
<tr>
<td>10:15 AM - 11:15 AM</td>
<td>Teaching reading early—benefits for later reading and language</td>
<td>Developing language—vocabulary and grammar</td>
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<tr>
<td>11:30 AM - 12:30 PM</td>
<td>Developing and supporting working memory</td>
<td>Activities to improve speech clarity</td>
</tr>
<tr>
<td>12:30 PM - 1:30 PM</td>
<td>Lunch On-site (included with registration fee)</td>
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<tr>
<td>1:30 PM - 2:30 PM</td>
<td>Developing communication skills and supporting children with ASD profiles</td>
<td>Teaching reading and using reading to support speech language development</td>
</tr>
<tr>
<td>2:45 PM - 3:45 PM</td>
<td>Activities to improve clarity of speech</td>
<td>Developing communication skills and supporting children with ASD profiles</td>
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<tr>
<td>4:00 PM - 4:30 PM</td>
<td>Closing remarks and Q&amp;A</td>
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**ASHA Continuing Education Units**

This program is offered for .7 ASHA CEU (intermediate level; professional area).
**Becky Baxter CertMRC SLT**

Becky is a speech and language therapist registered with the Royal College of Speech and Language Therapists and the Health Professions Council in the UK. She runs her own practice ‘Let’s Go’ providing a range of speech, language and education services – see [http://www.letsgouk.org/](http://www.letsgouk.org/).

Becky has had experience of working with children across a broad range of difficulties in a number of different settings including mainstream pre-schools and schools, a Specific Language Impairment Unit in a mainstream school and Great Ormond Street Hospital where her role included the management of caseloads, the use of a variety of assessments and intervention techniques and writing reports for external professionals including annual reviews.

She worked at Down Syndrome Education International full-time for 4 years where her roles included delivering specialist early development groups for children with Down syndrome from birth to school age; managing an outreach support service to children with Down syndrome in local mainstream schools, providing specialist assessment and consultancy services with families and in schools as well as delivering training conferences and workshops around the world.

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**Sue Buckley**

Sue Buckley is a Chartered Psychologist with over 40 years of experience in the field of developmental disability. Sue studied Psychology at the University of Reading, UK and then went to Oxford, UK, for training in Clinical Psychology. She worked in the National Health Service for several years and moved to teaching in the Psychology Department, University of Portsmouth in 1975. Sue continued clinical work in the community establishing early intervention services in the 1970s and began research into the learning needs of children with Down syndrome in 1980.

She continued to teach and research in the University as well as establish the work of Down Syndrome Education International from 1980. She also worked on national and local government bodies tasked with improving services for individuals with disabilities. For the past 30 years, Sue has travelled widely to speak at conferences and training events and she is in high demand as a speaker. She has also published widely for families, practitioners and researchers and played a leading role in stimulating growth in research into the education and development of children with Down syndrome worldwide.

Sue is knowledgeable about most aspects of the development of children and adolescents with Down syndrome, but her special area of expertise is cognitive development, particularly language, literacy and memory development. Sue also has firsthand experience of many of the issues that affect families as the eldest of her three children, Roberta, has Down syndrome and was adopted into Sue’s family when she was a baby. Roberta is now an adult living with her partner in supported independent living facilities.
DOWN SYNDROME SEMINARS
All sessions are 8:30 AM-11:30 AM
Down Syndrome Guild Conference Center
5980 Dearborn Street, Suite 100 Mission, KS 66202

Down Syndrome 101 for Educators
October 17, 2013 OR February 20, 2014
Are you an educator, professional or family member working with a student who has Down syndrome currently? If so, do you understand the unique learning profile of your student and how you can most effectively include, educate and encourage your student? Presenter will explore and provide information, resources, tips and strategies for the following:
- Common medical issues related to Down syndrome
- Communication issues and strategies for success
- How to improve social skills
- Processing time and memory issues
- Benefits of inclusive education
- Environmental issues which can hamper success
- Ways to adapt the curriculum
- Peer presentations to increase friendships
- Behavior intervention strategies
- Preferred teaching methods

Down Syndrome Specific Curriculum Supports
December 12, 2013 OR April 17, 2014
This educator led interactive seminar will help you better understand education support materials designed for learners with Down syndrome. Curriculums which improve reading, literacy, math, handwriting and memory skills will be covered. We will explore how these programs can be applied to your existing curriculum. Attendees will:
- Identify Ds specific curriculum, programs and tools
- Discuss common core standards and how to apply
- Evaluate IEP goals and assignments
- Review unique learning profile of students with Ds
- Learn helpful instructional styles that promote success
- Identify ways to motivate and engage students in the classroom
- Evaluate what works and ways to adapt what’s not working
- Learn how to modify and accommodate general education assignments to meet students needs

Effective Behavior Management Techniques for Students with Down Syndrome
September 26, 2013 OR January 16, 2014
Are you struggling to reach your student with Down syndrome? Frustrated that you spend a majority of your day managing behaviors instead of teaching? Do you feel your student is capable of more, but just can’t figure out how to get there? This hands on interactive seminar will provide practical strategies and real time solutions to help you work effectively and efficiently with your student who has Down syndrome. Attendees will learn:
- The benefits of providing appropriate processing time
- Tips for creating a high level of trust
- Creating a schedule and environment that works
- Planned ignoring techniques that work
- Strategies for dealing with the “pop and drop”
- Helping your student be responsible for his own behavior
- Consequences and reward systems that make sense
- Techniques for managing non-compliance

Practical Solutions for Improving Speech and Communication in students with Ds
November 14, 2013 OR March 6, 2014
As a pediatric SLP and parent of a child with Down syndrome, I have a unique opportunity and perspective. Have you wondered why speech is so difficult for your student/child? Why they seem to know or understand something one day but not at a later date? Have you considered how memory and processing affect language learning and use? Are negative behaviors impeding progress? This presentation will highlight:
- Typical learning profile for student with Down syndrome
- Language supports and strategies
- Identify ways memory directly impacts language and learning
- Speech therapy considerations and techniques
- Interventions which prevent negative behaviors
- Language considerations when adapting curriculum
- Language facilitation strategies that can be used across all environments

RSVP FOR SEMINARS TO INFO@KCDGGG.ORG OR 913-384-4848

Seminars sponsored by:

[Image of seminar sponsors]
CONNECT WITH THE PUJOLS FAMILY FOUNDATION

The Pujols Family Foundation proudly serves individuals with Down syndrome through extraordinary programs & services in St. Louis, Nashville, Southern California and Kansas City.

Please contact the Pujols Family Foundation to sign your child with Down syndrome up to participate in future programs & for up to date information follow us on social media.

In fact, get our your smartphone and connect with the Pujols Family Foundation right now!

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Down Syndrome Education International

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

Down Syndrome Education International

- 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 on the work of the charity see http://www.dseinternational.org/ and note linked US site http://www.dseusa.org/en-us/

Keep in touch with our work

- We have a large information site at Down Syndrome Online at http://www.down-syndrome.org/
- This has much information for teachers in the Down Syndrome Issues and Information Education series (DSII)
- There is also a wealth of papers by world leading experts in the Down Syndrome Research and Practice section
- Teaching materials, books and videos can be found at our online store at http://store.dseusa.org/

Evidence-based practice: what does research tell us about the specific language and learning needs of children with Down syndrome

Setting the scene for effective education

- What do we know about the effects of Down syndrome on development?
- First – the big picture across all areas of development
- Second – a closer look at the areas of specific weakness
- Do we know any of the reasons for this profile?
- What are the implications of what we do know for intervention strategies?
- If we apply these strategies – can we improve the areas of weakness and change the profile?
- Applies in special and mainstream classrooms – and to many other children
Effects of Down syndrome on development

- Most children will have delayed development
- There is a very wide range of individual differences from mild delays to more severe levels of disability
- For most children, severity of disability cannot be predicted at birth or in early years
- Not all aspects of development are equally delayed
- Research in the past 15 years has highlighted a profile of strengths and weaknesses
- We can use this information to be more effective in helping children reach their full potential – development is not fixed at birth

Typical profile associated with Down syndrome (see, Hodapp, Fidler, Buckley in DSRP 9 (3) on website

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>Strengths</th>
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<tbody>
<tr>
<td>Number</td>
<td>Non-Verbal Mental Age</td>
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<tr>
<td>Verbal short-term memory</td>
<td>Information processing</td>
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<tr>
<td>Motor Skills</td>
<td>Social understanding, empathy &amp; social skills</td>
</tr>
<tr>
<td>Vision</td>
<td>Self help and daily living skills</td>
</tr>
<tr>
<td>Hearing</td>
<td>Visual short-term memory</td>
</tr>
<tr>
<td>Language</td>
<td>Visual learning a strength</td>
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</table>

The specific developmental profile associated with Down syndrome

- Good social interactive skills
- Good empathy and positive personalities
- Sensitive to failure and negative emotional cues
- May use social skills to distract/avoid difficult tasks
- Good behaviour relative to mental ability and communication skills
- Good practical self-help/daily living skills over time
- Delayed early motor development – affects early learning through play and handwriting progress

The specific developmental profile associated with Down syndrome

- Significant risk of vision and hearing impairments
- Specific speech and language delays relative to non-verbal mental abilities

Cognitive strengths and weaknesses

- Specific verbal short-term and working memory difficulties
- Strengths in visual short-term memory and processing
- Academic learning
- Strengths in reading – can be at age level (10%+)
- Number more difficult – often 2 years or more behind reading

The importance of the weaker areas – speech, language and working memory

- Language underpins cognitive and social development for all children
- 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
- Any child with language delay will have cognitive (mental) delays (including executive function difficulties)
- Working memory deficits will affect all learning

Learning to talk

- Talking is for communicating – getting the message across, engaging with others
- Starts with looking, smiling, pointing – non-verbal skills for commenting, requesting, answering
- Then words – vocabulary learning – working out meanings and saying the words
- Then sentences – grammar learning – stringing words together for more complex meanings
- Talking requires clear speech skills – takes time for all children
Speech and language development

For most children with Down syndrome spoken language is delayed for mental age but they show an uneven profile

- **Communication** skills are usually good
- **Vocabulary** is delayed but grows steadily
  - understanding is ahead of expression
- **Grammar** is a challenge and lags behind vocabulary
  - tend to be 'telegraphic' talkers, using key content words
  - understanding is ahead of expression
- Clear **speech** is a challenge and speech is often difficult to understand

Vocabulary/grammar link

- Vocabulary size pushes along grammar development
- Children with Down syndrome have a vocabulary delay
- 200-250 words are needed before grammar starts
  - Understanding will be ahead of production
  - 200-250 words understood to begin to understand grammar
  - 200-250 spoken words to begin to use grammar

There will be many children with Down syndrome in kindergarten and elementary schools who do not yet have 250 words in spontaneous spoken language

Vocabulary/grammar link (Pemmen, Buckley & Archer 2000)

Why this learning profile?

- Hearing loss plays a part
- Auditory processing may play a part
- Slow vocabulary learning may delay grammar
- Difficulties with verbal short-term memory play a part
- We know nothing of early speech discrimination in children with Down syndrome
- Speech difficulties will delay language development
- We know very little about causes of speech-motor issues
  - Not just a motor issue
  - Planning component
  - Verbal short-term memory component

Looking in more detail at weaker areas - working memory

- Working memory is the immediate memory system that supports all mental activity
- The working memory system has several components
  - The **central executive** which holds and processes information
  - Supported by limited capacity stores
    - the **visual spatial scratchpad** - to hold visual information
    - the **phonological loop** - to hold verbal information
    - both hold information from senses for about 2 seconds
    - the **episodic buffer** which links to long-term memory
  - Capacity in working memory increases with age

Baddeley's 2006 Working Memory Model
Working memory is important for all children

- Working memory is the mental workplace in which information can be temporarily stored and manipulated during complex everyday activities.
- 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
- Predicts academic progress better than IQ (Alloway)

Verbal short term memory & language

- The phonological component supports verbal short-term memory (VSTM)
- Verbal short-term memory span improves with age and can be measured with digit and word span tasks
- Verbal memory span is influenced by increases in speech perception and production rates, and by reading ability
- The phonological loop influences the learning of vocabulary and syntax - and the storage and processing of sentences
- It seems to influence spoken language output - may play a role in holding the phonological structure of speech prior to output (Gathercole et al 2005)

Working memory in children with Down syndrome

- 4 year old typically developing 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 verbal working memory skills are delayed for mental age - a specific deficit
- Most of the research has measured verbal and visual short term memory
- Visual short-term memory skills are significantly better than verbal short-term memory skills in most studies
- However, recent Italian research has indicated visual STM impaired if material require simultaneous rather than sequential processing (dual tasks) and also central executive impairments (Lanfranchi et al)

Why this profile?

- A number of research studies by Chris Jarrold and team at Bristol University, UK have shown that the deficits cannot be explained by hearing loss or speech difficulties
- They suggest a phonological loop deficit - which will affect word learning as well as memory
- They have shown children with Down syndrome have specific difficulty learning the accurate phonological or sound pattern of words
- There is some evidence that training can improve working memory function including computer training - Cognmed (Bennett, Holmes, Buckley 2013)
- Early speech perception and production difficulties could be causal as systems have to tune to native language

Effects of poor verbal short term memory function

In other children with poor verbal STM
- Speech characterised by short utterance length
- Immature syntax/grammar
- Limited range of vocabulary
- Speech clarity issues
- Storage and processing of sentences
- Poorer reading and poorer maths


Executive functions now being studied

- Working Memory - Hold information in mind for purpose of completing/sticking with an activity. Shift - Move freely from one situation to another, solve problems flexibly. Inhibition - Control impulses and behaviour at correct time/content. Emotional Control - Modulates emotional responses appropriately to situation.
- Plan/Organise - Anticipates future events/consequences.
- Lanfranchi et al (2010) - adolescents with Down syndrome showed impairments relative to their MA on planning, inhibition, shift and working memory. Lee, Fidler et al. (2011) also report EF impairments and continue to study EF. Working memory and shift improved with WM training (Bennett et al 2013) - very preliminary finding.
- Important role of language in executive functions
Implications for intervention and education

Use social/emotional strengths
- build on emotional responsiveness – encourage social communication, looking, smiling, gesture
- early social communication underpins cognitive and language development
- talk to and play naturally with children
- build on social understanding – encourage ‘good’ behaviour

Always encourage AGE appropriate behaviour – do not ‘baby’ or ‘spoil’ child (or adult), have clear expectations and boundaries

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Implications for intervention and education

- Target speech and language difficulties from infancy and through school years
- Remember that children are visual learners
- Use reading to teach talking from early (2 to 3 years) and through school years
- Learning from listening will be specially difficult but learning from looking easier so always use visual supports – signs, pictures, reading, the computer
- Enable understanding to be demonstrated without the need to say it – choosing, pointing, selecting

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Implications for intervention and education

- Progress with grammar is linked to total vocabulary size for children with Down syndrome – therefore teaching vocabulary is an important goal from early
- Speech skills start in first year – therefore intervention should start then – games to develop discrimination and encourage production of speech sounds
- Non verbal communication skills predict talking (joint attention and pointing) therefore intervention should start in first year
- Gesture use can close the comprehension/production gap but we need more research on the proper use of signing

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Implications for intervention and education

Compensate for ‘weaknesses’
- Hearing, vision – regular checks, good health care – speak clearly, use signs, limit background noise. Involve sensory impairment team
- Address working memory difficulties with sound and word discrimination games from infancy, improving spoken language development and playing memory games
- Encourage motor development at all times
  - Active practice
  - Encourage active movement through play
  - Sporting skills are good for fitness as well as social skills

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In summary

- Children with Down syndrome are visual learners
- They learn from listening particularly difficult
- This effects learning to talk and it effects processing spoken language and instruction

If we plan interventions to
- to focus on teaching spoken language
- support all learning visually – especially with print
- to improve and compensate for working memory

Can we make a difference?
Our data for teenagers taught in this way from preschool years suggests we can

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Closing the speech-language/non-verbal ability gap

- This is another version of the earlier coloured profile slide
- One group show the expected profile – social and practical strengths, language weakness
- The ‘adapted input’ mainstream group show language skills as good as their other skills – it is possible to change the profile

Comparison across domains

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Language and literacy - inclusion study

- Very significant gains in literacy (mean gain 3.3 yrs) and expressive language (mean gain 2.5 yrs) in mainstream education
- Children fully included in mainstream classrooms
- Access the same curriculum with individual targets and in-class support
- Both groups had same range of abilities and social backgrounds at start of school

We can change the profile

- We can make a difference
- Outcome data from a study of teenagers shows significant gains in spoken language as a result of comprehensive interventions from early years
- Significantly better language and clearer speech
- Significantly better reading skills
- Linked to immersion in mainstream school/teaching to the profile of strengths and weaknesses
- Buckley, Bird, Sacks and Archer – see at http://www.down-syndrome.org/reports/295/

The evidence for a specific phenotype or profile

- See Deborah J. Fidler (Colorado State University) and colleagues for a recent reviews of the evidence
- The Emerging Down Syndrome Behavioural Phenotype in Early Childhood. Infants and Young Children (2005) 16, 2, 86-103
- The Down syndrome behavioural phenotype: Implications or practice and research in occupational therapy. Occupational Therapy in Health Care (2011) 25, 7-25
- And few access articles - preschool, primary and teenage profile papers
- Down Syndrome Research and Practice 9 (3) special section on the specific profile free at http://www.down-syndrome.org/research-practice/

Relevant research evidence is growing

- Whole journal issues devoted to Down syndrome – important review papers in 2007
- Mental Retardation and Developmental Disabilities Research Reviews 13 (3) 2007
- Journal of Intellectual Disability Research 51 (12) 2007
- Important recent review papers and chapters on cognition (Silverman), language (Fidler et al., Roberts et al., Abbeduto et al., education (Fidler & Nadel), reading (Green et al., Buckley, Snowling et al.), social development (Inacio et al., Cebula & Wishart)
- Gathercole & Alloway articles and books on working memory for teachers.

References – speech, language and memory


References – cognition and education

- Importance of full inclusion in changing the profile
Overview

1. Language learning
2. Encouraging prelinguistic and non-verbal skills
3. Using signs
4. Teaching vocabulary
5. Teaching grammar

- The ability to produce speech sounds influences vocabulary and language development therefore work on speech is equally important from the first year through childhood
- Language and speech work should proceed in parallel

1. Language profile - research update

- Communication skills are usually a strength
- Early vocabulary development is delayed
- The pattern of vocabulary development is the same as in typical development
- Typically developing children and children with Down syndrome show huge individual variability with vocabulary development
- Expressive difficulties become greater with increasing age for children with Down syndrome
- Vocabulary pacing grammar, just as in typical development
- Most children with Down syndrome are combining words and/or signs by 5 years of age.

Vocabulary/grammar link
(Pennannen, Buckley & Archer 2000)

Variability in early vocabulary production

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<td>Mean CA 35 to 44.75 MA</td>
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<tr>
<td>mean</td>
<td>range</td>
</tr>
<tr>
<td>Sign only</td>
<td>35</td>
</tr>
<tr>
<td>Sign and word</td>
<td>20</td>
</tr>
<tr>
<td>Word only</td>
<td>5</td>
</tr>
<tr>
<td>Total vocabulary</td>
<td>60</td>
</tr>
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</table>

Note: enormous variability in early vocabulary for those children with Down syndrome, the range is also very large at 77-519 words (Stokes & Hees)
Vocabulary development

- Little normative data available
  - DSL Speech and Language Overview see http://www.down-syndrome.org/information/language/over-eye/
  - Tables on both comprehension and production (Pennanen et al)
  - Information on reaching two word stage and on beginning to use grammar from our earlier studies
  - We are currently collecting normative data – it may change for each new generation
  - Vocabulary teaching is key to all aspects of language and literacy development

1. Language intervention

- Language is learned every day in natural situations as you talk to children – so the first thing to stress is the importance of talking to your child. The quality and quantity of talk influences language progress for ALL children.
- In addition – children with Down syndrome will benefit from explicit teaching of vocabulary and grammar
- This gives them more opportunities to hear and to learn words – more practice and repetition are needed
- Language learning begins in the first year of life and continues throughout life with the early years being a very important time

2. Pre-linguistic skills – babies & toddlers

- Pre-linguistic skills serve as the building blocks for language development and learning
  - eye contact
  - gesture use
  - imitation
  - joint attention
  - turn-taking
- Improved pre-linguistic communication will enable pre-linguistic children to communicate more effectively and lead to better language skills later on
- These non-verbal 'pivotal' skills continue to be important when children have started to talk

Eye contact and social responsiveness

- The development of sustained and meaningful eye contact plays an important role in the development of relationships
- Allows engaged and intimate interactions to take place between parents and infants
- Learn to use and understand smiling, facial expression, tone of voice, body movement and gesture as methods of communication
- Important that parents and caregivers respond to and interpret the social signals of babies
- Overall a strength area:
  - Eye contact is usually good
  - The children are person orientated

Gesture use

- ALL children go through a stage of using natural 'deictic' gesture (showing, pointing, requesting)
- Gesture is used for communication before words – particularly pointing/requesting
- Natural gesture use by parents and child links to later vocabulary development
- Children with Down syndrome use natural deictic gestures – showing, pointing and requesting at same MA as other children
- Children with Down syndrome make more use of gesture as toddlers
- Gesture use broadens ALL children's opportunities to communicate

Imitation

- Imitation is a key learning strategy for all children in the early years
- Children with Down syndrome have usually good at learning to imitate
- Can be a strength in social play situations and language intervention contexts in the early years
- Children with Down syndrome often use this strength for longer
- In later language development children need to develop more learning strategies
Joint attention
- Joint attention is when the infant and carer are attending to the same object or activity.
- In this situation the carer tends to talk about what they are both attending to.
- This helps the infant to 'see what you mean' and encourages comprehension of words and sentences.
- Important to 'follow the child's lead' to increase opportunities for joint attention.
- Children who experience more joint attention episodes learn language faster.
- Children with Down syndrome generally develop good joint attention.

Turn-taking
- Turn-taking in early games precedes turn-taking in conversation.
- Helps babies to learn about the 'back and forth' pattern of all social interactions.
- Parent and baby engage in babble or smiling 'conversations' with each partner taking a turn while the other pauses and listens.
- Helps babies and young children to develop an understanding of the pattern of interactions that they will use throughout their lives.

Pre-linguistic teaching programmes
- Pre-linguistic milieu teaching - promotes language development by teaching parents to engage in highly responsive interaction throughout daily routines - targets gesture, joint attention and eye gaze shift.
- Hanen approach - helps parents learn how to turn everyday routine activities into language learning opportunities for children.
- Responsive teaching - An early intervention curriculum designed to address the cognitive, language and social emotional needs of young children with developmental delay, focusing on 'pivotal behaviours' (including those discussed above) as the foundations for communication development.

Teaching early vocabulary
- Understanding comes before expression.
- Use DSE Vocabulary checklist - first 120 words - to select words to teach and to record progress.
- Have separate targets for words to understand and words to say - targets may be very different.
- Make it visual - objects, pictures and signs.
- Structured practice - short bursts.
- Extra practice in natural ways - e.g. play.
- Start with nouns and verbs and then move on to include a variety of words e.g. adjectives, prepositions.
- Matching-selecting-naming games - See and Learn.

Using gestures and signs
- Evidence suggests that teaching signs increases early vocabulary.
- Many children can sign words before they can say them.
- Signs hold the child's attention and can be a clue to the meaning of the word.
- Signs can be used when talking to babies from 6-9 months.
- Always say the word as you sign it.
- Remember you are using signs as a bridge to talking.
- The focus should be on teaching the child to talk.
- Our data shows that signs are steadily dropped as the child begins to say words.
- Note cautions about later use of signs at end of slides.

DSE research - children with Down syndrome
We have some data on sign and word development from two studies:
2. Some preliminary data from the first data collection point of an ongoing longitudinal study of 40 children aged 18-42 months at the outset.
- Note the data provides a guide to expected rates of spoken vocabulary development and is similar to other studies.
Signers and non-signers (Pennanen 2000)

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<thead>
<tr>
<th>Age (months)</th>
<th>Non-signers N = 133</th>
<th>Signers N = 58</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA (MA)</td>
<td>mean</td>
<td>std dev</td>
</tr>
<tr>
<td>12-21 (9)</td>
<td>10.7</td>
<td>12.7</td>
</tr>
<tr>
<td>24-33 (15)</td>
<td>28.1</td>
<td>34.9</td>
</tr>
<tr>
<td>36-45 (18)</td>
<td>102.6</td>
<td>107.7</td>
</tr>
<tr>
<td>48-59 (26)</td>
<td>227.2</td>
<td>145.6</td>
</tr>
<tr>
<td>60-71 (32)</td>
<td>293.7</td>
<td>181.4</td>
</tr>
</tbody>
</table>

Total productive vocabularies
Data from MacArthur CSDI words collected in mid 1990s
(NB cross-sectional data & large individual differences)
Signs seem to give an advantage to 36 - 47 months, mental age of about 21 - 24 months. By 4 years no difference in productive vocabulary size = as Miller predicted and TD data predicts

Changes in word and sign use over 12 months

<table>
<thead>
<tr>
<th>Group</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-21 (9)</td>
<td>50%</td>
<td>33%</td>
<td>9%</td>
<td>50%</td>
</tr>
<tr>
<td>24-33 (15)</td>
<td>33%</td>
<td>44%</td>
<td>23%</td>
<td>31%</td>
</tr>
<tr>
<td>36-45 (18)</td>
<td>9%</td>
<td>29%</td>
<td>22%</td>
<td>30%</td>
</tr>
</tbody>
</table>

NB Preliminary data and considerable individual variation
Group 1: N=46
At 23 months CA, the children have words for 42% of vocabulary
At 30 months CA they have words for 72%  
Group 2: N=26
At 36 months CA, the children have words for 33% of vocabulary
At 46 months CA they have words for 75% of vocabulary

Research summary: children with Down syndrome

- Signs increase total productive vocabulary from MA 14m to 26 m – this would be about 4/5 years old (CA) for children with Down syndrome
- Typically developing children use signs from 14-26 months of age – then spoken words take over from signs
- Children with Down syndrome are in this stage of using gestures and signs for a longer time period
- The percentage of total vocabulary that is signed decreases with age even from 24 to 36 months CA
- At 4/5 years, most children with Down syndrome are decreasing use of sign and increasing use of spoken language (Miller; Berglund; Buckley)

See and Learn Language and Reading

- A practical resource for professionals and families
- A language programme that focuses on receptive language, expressive language and reading development
- Teaches vocabulary on DSE Vocabulary Checklist 1
- Kits and apps available

See and Learn – picture matching

- Matching – child matches picture to picture while hearing and learning the word
- Selecting – child chooses the picture when you say the word – so demonstrating comprehension of the word
- Naming – child can name picture
- This is a very effective procedure for teaching words, colours, numbers, shapes....
- Most children will be able to select many pictures correctly showing that they are understanding the words long before they can say them without a prompt
- Important to record what they understand and keep teaching new words for their cognition
See and Learn Language and Reading

1. First Words Pictures
   - 60 first vocabulary pictures and matching baseboards
     - Guidebook, instructions and record sheets for activities
2. First written words
   - 16 written words, 20 phrase cards, matching boards, 9 books
     - Teaches range of 2 "key-word" phrases
3. More Words Pictures:
   - 55 more first vocabulary pictures and baseboards
     - Instructions and guidance for activities
4. First Sentences
   - Introduces 16 more written words within simple sentences and
     4 books- teaches a range of three "key-word" sentences

Special words app – match pictures, hear word

Special words app – match picture to word

Special words app – match printed words

Special words app – match print to picture

Special words – add your own words and pictures
www.Specialiapps.co.uk

**Special words** – first pictures and words from See and Learn Language and Reading program
- Adaptable, you can add your own pictures and words
- Available in many languages

**Special stories** – for creating personal books
You can get the See and Learn Language and Reading books from our website to download into Special Stories Apps and software play to our children’s strengths as visual learners
Very powerful learning tools but learning from app must be generalised to everyday use

Encouraging Word Production

- Choose words the child already understands
- Modelling and imitation
- Give choices
- Create opportunities for the child to communicate
- Respond to all word attempts
- Allow extra time for responses
- Keep a record
- Use DSE vocabulary checklists

Film clip – teaching vocabulary

Film clip – Understanding pronouns – 4 years old

Language and Grammar - research

- The same 2 and 3 word combinations as typical development
- Average age for emergence of 2 word phrases – 3 years old (Kumin 1999)
- Expressive grammar – particular area of difficulty (understand and express concepts, but are not using the morphological markers (e.g. plural 's', past tense 'ed', possessive 's')
- By 3 years old many will understand early grammatical concepts although not able to use the grammatical markers until about age 5. (Kumin, 1999)
- May be linked to speech difficulties
Developing knowledge networks

- The first 100+ words children learn are for people and activities in their daily world – common in all languages.
- As their vocabularies expand they will learn words more easily if they can link them with words they already know so teach in themes.
- Research shows that they learn words faster in a context.
- Make sure you teach a range of words, nouns, verbs, adjectives, pronouns, prepositions etc (DSE vocabulary checklists provide a guide).
- Also very important to teach category words for linking words by meaning and supporting memory.

Language and grammar - intervention

- Modelling
- Imitation and expansion
- Use of signs
- Pictures/props
- Pacing boards
- Repetition and practice
- Conversation diary
- Sequencing cards/games
- Focused personal books (e.g. plural book)
- Open-ended questions (e.g. tell me more...)

Importance of expansion

- Importance of expansion as a language teaching tool.
- It is a natural tool for teaching sentences and grammar – when children are at a 2 ‘keyword’ stage, child says ‘Daddy gone’ and you say ‘Yes, Daddy has gone’.
- Or ‘Mummy shoe’ and you say ‘Yes it is Mummy’s shoe’.
- When making personal books or conversation diaries – ask child to talk about the picture – then take their key words e.g. ‘play sand’ and make shortest correct sentence ‘I played in the sand today’.
- This way you will be giving them the language for what they are looking at/thinking about – very important if they are to understand and remember it.

Sharing books

- Reading books together is a very powerful way to teach new vocabulary and sentences.
- Repetitive reading of favourite stories.
- Talking about the people and the activities in the book.
- Most children with Down syndrome love to share books.
- Give them time to take in information and join in.
- Encourage pointing to the pictures as you talk about them.
- Follow the child’s lead - let them point and show their interest.

Importance of daily communication

- The extra teaching games will make a difference.
- Daily repetition and practice.
- But children learn to talk because we listen to them and they can effect their world – ask for things, tell you how they feel.
- It takes children with Down syndrome longer to plan and say words and sentences – we need to give them time.
- We need to sensitively support daily talk and be sure to respond to all communication attempts – any sounds or gestures – to encourage more.
- When children are late to talk and say few words they get talked to less and have fewer learning opportunities.

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Summary

- Developing spoken language should be a priority — at home and in preschool
- The number of words a child knows matters — vocabulary teaching should be planned and progress recorded until at least 600 words are spoken
- Use visual supports — objects, pictures, signs
- Use ‘expansion’ to teach sentences and grammar
- Make full use of story books
- Make personal books
- Communicate naturally with your child at every opportunity

Cautions – real and possible

1. Signs cannot teach phonology and grammar
2. Signing is sometimes not stressed as augmentative — need to encourage sounds, words, lip-reading from first year of life
3. We do not know how children cope with attentional demands of sign plus speech or if signing changes how parents talk to children
4. Signs can reduce parent responsiveness to child’s speech attempts
5. Signing may reduce child’s spoken word attempts — use of voice/sounds/words need to be encouraged at all times
6. Research indicates that by 4-5 years, most children with Down syndrome are switching from majority of signed words to majority of spoken words — spoken language should be the focus from 4 years old for most children
7. By 4-5 years old, print is a better support for phonology and grammar

Use of sign with children with Down syndrome

No clear evidence of benefits — poor control groups in few studies that are often quoted in favour of signing. We need much more sophisticated longitudinal research.

Arguments in favour:
- Strength in natural gesture
- Risk of hearing loss
- Working memory delays
- Risk of phonological issues
- Speech delays
- Increases attention
- Reduces frustration
- Increases quality and quantity of parent-child communication
- Improves general communication between child and parent

Resources

- Hanen approach — It Takes Two to Talk; [http://www.hanen.org/web/home/HanenPrograms/ItTakesTwoToTalk/PP/Default.asp]

DSE See and Learn Language and Reading

See and Learn First Words Pictures
See and Learn First Written Words
See and Learn More Word Pictures
See and Learn First Sentences
Kits available DSE shop [http://www.dseusa.org/en/usa/resources/teaching/see-and-learn/]
See and Learn More Sentences - 2014
See and Learn Letters and Sounds — 2014
Kits to download and make plus DSE app versions of kits 2014
References

**Developing early reading skills - SLT**

- Why reading for SLTs?
  - SLTs are in an ideal position to support parents and teachers to teach reading.
  - Especially as we introduce it early with the express purpose of using it to improve spoken language development.
  - SLTs can advise on the vocabulary and personal books to make.
  - SLTs can advise on suitable story books to share.
  - Reading activities teach phonological awareness and may improve speech.
  - At all ages reading is a powerful way to teach language.

**Teach reading early – why?**

- Sarah Duffin’s story
- Our first reading research in 1980-1983
- Printed words seem easier to remember than spoken words – a real strength for many children with Down syndrome from as early as 2-3 years.
- Develops their spoken language.
- Sight words used to teach spoken words and sentences – so sight vocabulary is chosen based on language development.
- Sets the foundation for learning to read - phonics taught at 4-5 years.

**Reading for children with Down syndrome**

- Reading is an important and worthwhile goal for all children.
- Many children with Down syndrome are able to develop some level of independent reading ability – all benefit from reading activities and books.
- Literacy attainments vary widely with some 10 year olds able to write short stories unaided and some learning a sight vocabulary – Many of the highest achievers were introduced to reading at an early age.
- Some children ‘take off’ with reading as teenagers.
- Reading shares reciprocal relationships with speech, language and working memory development – they benefit each other.

**The benefits of developing reading**

- Literacy is an important goal in itself.
- In addition:
  - Learning from listening is difficult for children with Down syndrome, learning from looking is easier.
  - Printed words seem easier for them to remember than spoken words.
  - Reading activities can teach new vocabulary and new grammar.
  - Reading supports spoken practice of words and sentences as children read aloud or imitate.
  - Spelling and phonics work can support articulation and phonology so improve speech intelligibility.
  - These benefits are true also for non-readers (i.e. supported reading activities).

**Overview**

- First steps to literacy from 2 years
  1. Teach a small sight vocabulary.
  2. Use these sight words in sentences.
  3. Ensure the sentences can be read and understood.
  4. Teach text comprehension strategies.
  5. Practice formulating sentences.
  6. Use Personal Books.
  7. Develop phonics skills.
  8. Make activities fun and motivating.
  9. Start RLI for 5-6 year olds.
1. Teach a small sight vocabulary first

**Whole word reading**
- Pre-school children — we start whole word/sight word reading activities when:
  - a child understands 50—100 words
  - is able to match and select pictures
  - this is usually around 2.6-3.6 years of age
- Choose words that the child understands and finds motivating e.g. family names.
- Introduce words through the hierarchy of matching, selecting and naming.

2. Use these sight words in sentences

- From the beginning choose words to make simple grammatically correct sentences.
- Select words as appropriate for the child's language comprehension level and interests, starting with words that the child already understands.
- Always read the words and sentences with the child while they are learning — that is use errorless learning techniques to support success.
- Make books using pictures of the child's own world and interests to illustrate the sentences.
3. Ensure words and sentences can be read and understood
   - From the start ensure that the child is reading for meaning.
     - Can read word and match to correct picture
     - Can read sentence and match to correct picture
   - In books
     - Use of pictures to support understanding of text.
     - Act out sentences/match to pictures to ensure understanding
   - Once the child is enjoying the reading activities with familiar vocabulary, introduce new vocabulary and grammar targets into the reading.
   - Always be ready to prompt to support success but give child time to respond first

4. Teach text comprehension strategies
   - Sequencing – familiarity with concepts and language (first, next, last), start with sequences/routines that the child is very familiar with e.g. Daily routines (bath time, brushing teeth), favourite nursery rhymes and stories.
   - Retelling/repeating – repeating sentences the child has read, asking the child to repeat sentences you have read, use of carrier phrase activities.
   - Summarising/commenting – 'my favourite part was ....'
   - Questioning
   - Use of modelling and scaffolding

5. Practice formulating sentences
   - Matching the key word in a sentence
   - Matching all the words in a sentence
   - Ordering words to form a sentence
   - Choosing words to make own sentence
   - Filling in the missing word
6. Personal books

- These books should be:
  - Written as if the child has written it themselves
  - Written at an appropriate language level for the child
  - Created together with the child to build understanding

- Examples of this type of book include:
  - carrier phrase books – I like... I can...
  - Conversation diaries
  - Topic books

Personal book (film clip)

Personal book

See and Learn Language and Reading – step 2

First Written Words – 16 written words
- 16 written words picture cards/16 written words word cards
- 9 books
- 20 phrase cards
- Guidebook and instructions for activities
- Record sheets

See and Learn Language and Reading – step 4

First Sentences
- 24 word cards/24 picture cards
- 6 word to word matching base boards
- 16 sentence cards and matching picture boards
- 4 reading books
- Guidebook and detailed instructions

See and Learn First Sentences

Copyright © 2012 Dover Syndromes Education International
7. Teaching phonics

- Start to teach 'phonics' once the child has a sight vocabulary of 30-40 words (pre-schoolers) or with the rest of the class in school.
- As with all activities using visual supports is key e.g. pictures, plastic letters, whole words
- Many of the early phonics skills will overlap with speech activities e.g. Letter sounds, initial sounds in words
- See and Learn Letters and Sounds coming soon – evaluated with 4 year olds – teaches letter sounds 6 at a time to make rhyming words e.g. cat, hat, mat, bat.
- An easy way to start phonics and we were surprised at the children's progress

7. Phonics is important

- Children learn to read using a variety of strategies
  - Sight word learning to get started and for the many irregular words in English (yacht, island, was...
  - Context – guess the 'new' word by choosing a word that gives correct meaning or grammar in sentence
  - 'Sounding out' – sound out the letters in an unfamiliar word in the book and try to 'blend' them to identify the word – this is using phonics
- Phonics is also very important for working out how to spell a word – the faster children understand phonics the faster they progress as readers

7. Component skills for phonics

- There are three important component skills
  - Phonological awareness (PA) – the ability to hear sounds in words
  - Letter sound knowledge - learning the sounds represented by letters
  - Using letter-sound knowledge and PA to work out a printed word by 'sounding out' and 'blending'
- Children need to be taught all three
- Studies show children with Down syndrome use their strong sight word skills to support their reading for longer than other children but many do master and use phonics
- US research Lemos et al showed children with Down syndrome with more sight vocabulary learned phonics faster

7. Phonological awareness

- Listening to sounds (phonology)
  - Use visual supports where helpful (pictures/objects)
  - Rhyme
    - Rhyme matching/pairing game, rhyme oddity, rhyme production
    - Works with pictures/objects/word cards
  - Phonemes
    - Discriminate initial/end sounds:
      - Matching and sorting games: ask child to match pictures or objects based on starting or ending with the same sound
      - Visual scenes: ask child to find objects in a picture that start/end with a certain sound
      - Play snap (something beginning/ending with)
      - Listen to spoken word pairs; do they start/end with the same sound or not?

7. Phonics and phonological awareness

- Phonemes (continued)
  - Blending
    - Use phonemes the child knows
    - Use a toy to do 'sound-talk': TA does the sound talking – What word is the toy saying? 'c-a-t'
    - I say with a few objects e.g. TA says, I say with my little eye a 'p-e-n'
  - Segmenting
    - Use phonemes the child knows
    - Use a toy to do 'sound-talk': child does the sound talking – TA says, 'Can you say 'cat' in sound-talk?', child says 'c-a-t'
    - Phoneme frames: ask the child to sound out a word (e.g. dog) and put a coin/counter into the frame each time a sound is said
7. Phonics and phonological awareness

- Linking letters and sounds for reading
  - Revisit the 'sound-talk' and phoneme frame activities but using magnetic letters. E.g. Give child the letters for 'cat', (plus 1/2 extra) and ask them to spell out 'cat'
  - Spread out the magnetic letters that spell a word, ask child to say each letter, slide the letters gradually closer to one another, the child says the letters faster together, until they blend them into the whole word
  - Give them flashcards with words and ask them to sound them out (d-o-g), then put them together to form the word (dog)
  - Model sounding out whenever a child gets stuck on reading a word in their reading books

8. Make activities fun, model correct responses and prompt success

- Make reading fun and meaningful
  - Use a variety of activities and/or presentations
  - Choose texts and sentences that relate to the child's interests or knowledge from everyday life
  - Be enthusiastic!
  - Play games and activities with the same vocabulary to support understanding and recognition.
  - Use errorless learning – ensure lots of practice and experience before introducing testing.
  - Children with Down syndrome can be sensitive to failure and we want to guarantee their success and motivation!

RLI – Reading and language program

- We have designed and evaluated a school reading and language program which incorporates these principles
- Progress was significantly faster on key reading and language measures on the programme
- Younger children (5-6 years) made faster progress
- RLI Handbook and Resources published with video
- An pilot project in Texas shows RLI can be used in US schools with positive outcomes for both reading and language
- Training educators across Texas at present plus RLI accredited US based trainers and offer Web training

http://www.dsesusa.org/en-us/resources/teaching/rli/

RLI Programme Structure

- Daily 40-minute individual sessions, delivered by trained teaching assistants
  - Teaching sessions (1 to 4, 6 to 9): routine structure
  - Consolidation sessions (5 and 10): reflect and revise
- Two interactive components
  - Reading Strand
  - Language Strand
- Prescribed programme
  - Set out in manual
  - Opportunities to tailor sessions to play to individual's strengths and address weaknesses

Evaluated with 5-10 year olds – follow link to published paper

RLI Session Structure

<table>
<thead>
<tr>
<th>Reading Strand (20 mins)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading new level book</td>
<td>2-3 mins</td>
</tr>
<tr>
<td>Reading new instructional level book</td>
<td>5 mins</td>
</tr>
<tr>
<td>Sighting learning</td>
<td>5 mins</td>
</tr>
<tr>
<td>Letters, sounds, phonology</td>
<td>5 mins</td>
</tr>
<tr>
<td>Introduce new level book</td>
<td>5 mins</td>
</tr>
<tr>
<td>Language Strand (20 mins)</td>
<td></td>
</tr>
<tr>
<td>Vocabulary: introduce new words</td>
<td>5 mins</td>
</tr>
<tr>
<td>Vocabulary: reinforce meaning of new words</td>
<td>5 mins</td>
</tr>
<tr>
<td>Expressive language: use new words in connected speech</td>
<td>5 mins</td>
</tr>
<tr>
<td>Expressive language: use new words in written language</td>
<td>5 mins</td>
</tr>
</tbody>
</table>
Resources

- See and Learn Language and Reading
  - First Words
  - First Sentences
  - See and Learn apps for iPad at http://store.dseusa.org/collections/see-and-learn-language-and-reading
  - See and Learn apps for iPad at http://www.specialapp.com/en/usa/
  - Down Syndrome Issues and Information books on Reading – see http://store.dseusa.org/collections/books/reading (to be updated 2014)

Introducing RLI

Further information about RLI:
- DSE web site: http://dsuni.net/YRLC01
- Scientific paper reporting RCT: http://dsuni.net/0XR06Z
- Online events: http://dsuni.net/2p4d94
- New RLI blog: http://dsuni.net/2M7B6K
- RLI email group: http://dsuni.net/4AdhdP

Handbook
- From UK store: http://dsuni.net/YRGILp
- From US store: http://dsuni.net/XoYC1u

RLI Handbook
- Instructions for delivery each component, ideas for teaching activities and adaptations to suit individual abilities
- Practical information on delivering intervention, record keeping and collaboration
- Resources for assessments, teaching, planning and record keeping
- Video illustrating each component and activities for teaching, including examples of children with different starting levels, strengths and weaknesses
- Background information on development and evaluation
- http://www.dseinternational.org/en/resources/teaching-ri/ for more information on the intervention

References to RLI and blending study


DSE will be publishing more practical materials to teach letter sounds, blending and phonics in 2014 – sign up to e mails to stay informed

References – Literacy and Down syndrome

Overview

- What is working memory?
- What do we know about its development in typically developing children?
- What do we know about its development in children with Down syndrome?
- What is the practical significance of working memory deficits?
- What can we do to improve working memory?

What is Working Memory?

- Working memory: allows us to hold and manipulate information in the mind over short periods of time
- Central Executive: attention, the control of action, processing and problem-solving
- Phonological loop: stores verbal information in phonological form
- Visuo-spatial scratchpad: holds visuals and spatial information
- Episodic buffer: links with long-term memory and stored information – remembering routine activities in life

Effects of poor working memory

- Limits in central executive – working memory system as a whole, now referred to as complex working memory – will influence progress in all complex tasks
- Limits in phonological loop function – verbal short term memory will directly affect vocabulary learning from infancy and through school years
- Poor WM capacity is a ‘bottleneck to learning’
- Importance of automaticisation – once skills/knowledge over learned and automatic, working memory load reduced

Working memory is important for all children

- '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 at 6-7 years old (Year 2)
Working memory – academic progress

- Poor working memory places children at high risk for slow, academic progress, particularly literacy and numeracy
- Failure to follow instructions
- Problems with activities involving storage and processing
- Place-keeping difficulties
- Attentional problems – easily distracted; difficulties with concentration – working memory overload

Verbal STM in children with Down syndrome

- Verbal STM impaired relative to visual STM and relative to MA in children and in adolescents with Down syndrome - confirmed in many studies using digit span even when response required is point rather than say
- Also confirmed using non word repetition with lenient scoring (Lawes 1998, Laws and Gunn 2004)
- Jarrold and colleagues conclude it is due to capacity limitations in the phonological store
- Central executive tasks too difficult for children (backward digit span)

Memory and Down syndrome

Research has shown that adolescents with Down syndrome have specific deficits in the verbal memory domain.
- Their visual memory skills are poorer than average. (Getz & Waring, 2006; Heslin, 2006; Toms & Davis, 2006)
- This graph shows how adults with Down syndrome performed relative to normal controls on the three components of verbal STM. (J.Bosma & K.W. Searle, 2013)

Phonological loop functioning

Evidence shows that there is a basic impairment in phonological loop functioning in children with Down syndrome.

Phonological loop is a 2 component system:
1. Passive phonological store – material is subject to time based decay.
2. Articulatory rehearsal process that serves to refresh and maintain information in the store.

Language learning and phonological loop

- Effect of poor phonological loop function on learning vocabulary greatest to 4-5 years of age in typical development (Gathercole)
- By 8 years, the main route for learning new vocabulary (and grammar) is from reading
- Exposure to print and reading words in context important
- Children with Down syndrome use linguistic knowledge to support STM in non word repetition tasks to compensate for poor VSTM (Cham & Jarrold) – and other resources (Moore & Jarrold)
- They also use context to support grammar deficits (Joth)

Links between speech, language and VSTM

- Phonological loop may have developed as language acquisition device (Gathercole)
- When learning a word sound pattern needs to be held and stored
- Recent research shows children with Down syndrome poor at learning detailed phonological forms of words. Learned meaning of new words but not fully accurate spoken form – very important study (Jarrold, Thorn, Stephens at Bristol)
**Maggie Vance – 2008 chapter**

- Identifies that working memory development and spoken language development intricately linked
- Develop together which is why SLI children like DS children in language and memory profiles (Laws & Bishop)
- Develop phonological skills to support phonological loop function – Phonological Awareness training
- Develop strategies to support recall-rehearsal, visual imagery
- Adapt the way material to be learned is presented
Developing memory skills - interventions

Rewards findings suggest 3 types of interventions may help to develop working memory:
1. Activities to improve phonological loop function
2. Activities to improve attention and to increase processing capacity
3. Activities to improve remembering of lists of items and associations between items, including categorisation and rehearsal strategies

Also provide supports for remembering: visual aids, songs, use of context, routine

Activities to improve phonological loop function

• Compensate for hearing/listening difficulties
• Listening, discrimination, production of sounds
• Listening, discrimination, production of words
• Phonological awareness activities
  • letters and sounds
  • Initial/medial/sound in words
  • Word families
  • Blending
  • Segmenting

Activities to improve attention & processing capacity

• Sitting still
• Making choices - objects, pictures, relevant, gestures/ignores
• Following instructions - one to one, in a small group, in the whole class
• Waiting for turn
• Reading book with adult
• Teaching new play/leisure skills

Activities to improve remembering number of items

• Hiding games
• Memory games
• Rehearsal training – pictures, numbers, words, sentences and spellings
• Auditory-verbal rehearsal
• Grouping or organisational skills (sorting, odd/even tasks, memory tasks in categories)

Rehearsal training

Rehearsal training/auditory rehearsal
Other activities

- Delivering messages
- Giving the child instructions to follow
- Recall of activities
- Recall of stories
- Use of songs
- Games (e.g. pairs)
- Computer games

Memory training research - Down syndrome

Rehearsal training:
Rehearsal training studies have found that some improvements were made, but were only modest gains and were not sustained - and indeed gains did not transfer to working memory (Boulié et al 1994, Comblain, 1994, Law et al. 2000, Counsell 2000)

(auditory/slicing strategy ...Broadley et al. 1994)

There is a clear need to further explore memory training programmes and see if they lead to lasting memory gains. Lead to other cognitive or language gains

Cogmed Published Research

1. Adaptive training that taxed working memory to its limits was associated with substantial and sustained gains in working memory, with appropriate levels achieved by the majority of children compared with non-adaptive training (Children with low WM), (Holmes, Gathercole & Dunning 2009)

2. When compared with medication, Cogmed training showed greater benefits on all aspects of working memory (Children with ADHD), (Holmes & Gathercole 2009)
Working Memory and the Brain

Training induces significant increases in WM-related activity in the prefrontal cortex. (Seeberg, 2005)

Training results in changes in the density of cortical dopamine D2 receptors. (Mott & Vanpne, 2003)

Measuring Memory (AWMA, 2007)

Verbal STM - e.g. Forward digit:
- 7
- 64
- 854
- 4318

Sequential WM - e.g. Counting span

Visual STM - e.g. Block recall

Visual WM - e.g. Cards out

Raw AWMA Scores (pre and post training)

<table>
<thead>
<tr>
<th>Group</th>
<th>Time</th>
<th>Verbal</th>
<th>STM</th>
<th>WM</th>
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<tr>
<td>G001</td>
<td>1</td>
<td>13.10</td>
<td>7.60</td>
<td>15.10</td>
</tr>
<tr>
<td>G001</td>
<td>2</td>
<td>14.10</td>
<td>8.40</td>
<td>16.00</td>
</tr>
<tr>
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<td>3</td>
<td>15.10</td>
<td>8.80</td>
<td>17.20</td>
</tr>
<tr>
<td>G002</td>
<td>1</td>
<td>13.00</td>
<td>8.20</td>
<td>13.40</td>
</tr>
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<td>G002</td>
<td>2</td>
<td>12.91</td>
<td>7.61</td>
<td>12.37</td>
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<td>G002</td>
<td>3</td>
<td>25.43</td>
<td>8.64</td>
<td>15.10</td>
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</table>

BRIEF-P – Executive Functioning Measure

- Working Memory - Holds information in mind for the purpose of completing a task with an activity.
- Shift - More likely to have an alternative to make, solve problems flexibly.
- Inhibition - Controls impulsiveness and helps to control timeframes.
- Emotional Control - Modulates emotional responses appropriately to situations.
- Plan/Organize - Anticipates future events/sequences.

High score indicates difficulty in this area - average score for typical drift is 55.
Executive Functioning

<table>
<thead>
<tr>
<th></th>
<th>Dose</th>
<th>Inhibition</th>
<th>Shift</th>
<th>Emotional</th>
<th>Working Memory</th>
<th>Plan/ Organise</th>
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<td>85.94</td>
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<td>76.90</td>
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<td>56.65</td>
<td>57.09</td>
<td>72.19</td>
<td>62.00</td>
</tr>
</tbody>
</table>

BRIEF-P – Standardised Score Change

Future directions – memory improvement

- Further trials of Cogmed or similar with longer term follow up to see if these gains are sustained in language, academics, behaviour, attention.
- Other work on [Link](http://www.dhiinternational.org/en-gb/news/2013/03/26/med-aid-mind)

Summary

- Executive functioning was flexible and improved short term visual memory in children with Down syndrome in our study.
- Executive functioning may be suitable for younger children with appropriate support – e.g. depending on their existing memory skills.
- Children who completed Cogmed training had less problems on the NIH vocabulary test.
- Gains are maintained - children see an improvement in their performance on the NIH vocabulary test over time.
- It is important to note that the study continued for 2 years.

Future directions – memory improvement

- Further trials of Cogmed or similar with longer term follow up to see if these gains are sustained in language, academics, behaviour, attention.
- Other work on [Link](http://www.dhiinternational.org/en-gb/news/2013/03/26/med-aid-mind)

Summary - targeting the profile

- Take account of auditory short term memory weaknesses
- Practise words to improve the stored sound patterns
- Play memory games
- Support learning with visual materials, pictures and print, to reduce memory requirements
- Reduce the amount of material to be remembered
- Make it meaningful and familiar
- Restructure complex tasks/instructions - simplify

Supporting working memory

- Visual supports for:
  - Supporting visual presentation of information
  - Understanding the activity
  - Supporting responding (writing, speaking) and assessment
  - Developing independent work habits (with a picture/word list to follow)
  - Increasing attention and participation
  - Improving behaviour – give socially appropriate strategy
  - Relevance - of the lesson and specific objectives e.g. vocabulary that has been targeted for pupil
Children with Down syndrome compensate

Remember that studies show that children with Down syndrome
- Can use higher order skills such as inferencing from world knowledge and context to help overcome working memory limitations or "bottleneck" (Lavorato, Roch 2009)
- They can use mental imagery (de la Iglesia 2005)
- They can draw on their stored knowledge of words to support them in verbal short term memory span tasks
- Use of context can help with remembering information – use sentences

Useful books – recommended reading

  Includes good chapter on working memory in Down syndrome.

Resources and references

- Buckley, B. (2001) Memory development for individuals with Down syndrome. (Self book online/shop)

References

Pragmatic skills

- Initiating
  - Requests
  - Proposals
  - Sharing information
- Maintaining
  - Conversation
  - Taking turns
  - Maintaining topic
  - Changing topic
  - Repairing or modifying topic
- Narration
  - Language for telling a story or experience

Pragmatic skills – typical development

- Early non-verbal turn-taking forms the basis of turn-taking in conversation
- 9-12m – intentional communication
- 2y – request information, answer questions
- 3y – maintain conversation topics
- 4y – talk about people and events more distant in time
- 5y – can maintain topic 80% of the time
- 7-9y – can understand other person’s point of view, can repair conversation breakdown
- 12y – narratives include thoughts and feelings about events and resolutions

Pragmatic skills – Down syndrome

- Appears to be a relative strength
- Progress through the same stages in similar order
- Pre-linguistic stage – research findings are mixed
  - Some have found similar rates of commenting, lower rates of requesting (Murch)
  - Commenting and requesting are both linked to better language outcomes (Toker)
- Children and teenagers may be less likely to introduce a new topic and may elaborate less to maintain topic
  - However – speech problems and ineligibility are a major influence on their conversational skills – not all pragmatic difficulties

Narrative skills – Down syndrome

- Relative strength when visual supports are used
- Children with Down syndrome used same themes, salient events and plot as children matched for cognitive level and language comprehension in narrative reports of wordless video events and storybooks (Boudreau, Chapman 2000; Miles & Chapman 02) but used less complex language to share this information
- When stories presented verbally, without picture support, the amount recalled was less than matched children (RBR, Chapman Schwartz)

Repair and social perspective taking

- Able to repair when asked for clarification
- Less likely to take in the needs of the listener
- Weakness in referential communication, related to expressive language deficits
- Teenagers less able to guess what other people know – related to knowledge base?? (Abbeduto)
- Need for those around them, peers, family, staff, to understand their difficulties and to compensate
Supporting social use of language

(adapted from Kumin – Classroom Language Skills for Children with Down Syndrome, Woodbine House)
- Eye contact – cue and reward for increased eye contact
- With physical prompts
- Picture of wide open eyes
- Facial expression – need to match what is being said
- Dictionary of facial expressions
- Comment of emotions and characters – books/TV
- Mirror practice

Supporting social use of language

- Simple use of gestures for communication
- Play-based ways
- Pictorial Cues
- Class ‘sitting’ time – everything is conventionally new/unfamiliar
- Requests
- Weaker requests (e.g. ‘No, I don’t want that’)
- Context of development, then need to retrain
- ‘Why?’ questions – more years old
- Incongruity
- Ask the class questions for a graph – e.g. ‘Is everyone wearing?...
- Ask what they want to drink facilitated
- Mystery games – e.g. Animal sticker book – have to ask questions and guess
- Schedules
- Requests for objects
- Instructions for partners

Supporting social use of language

- Pragmatics – other area of difficulty
-Bugling: inappropriate/age-appropriate behavior
- Making fun
- Weight play
- Conversation skills
- Asking
- Topic shifts
- Most-consecutive points – sends a message
- Building to do anything
- Topic switch – children’s comments
- Social skills
- Tell me more
- Conversation order
- Role play

Supporting social use of language

- Skill variations: the way people communicate in different situations
- Act with people in pairs
- Scripts: pretends talk to different audiences
- Communication breakdown – repairs
- Reproduce reasons for disconnection
- Special event communicability for breakdown: ‘You’re not very good’ to encourage confidence in repairs
- Prose: background knowledge and prior experience that the listener needs to bring to a conversation
- Simple patterns
- Simulate something they see through VividMax or Imagi-Worlds
- Explain directions to a game as if it is the first time you have played it

Down syndrome and ASD

- ASD (Autistic Spectrum Disorder) combines two types of diagnosis
- Autistic disorder (AD) — more exclusive diagnostic
- Pervasive Developmental Disorder — not otherwise specified (PDD-NOS)— more inclusive diagnosis
- For children with DS, ASD dual diagnosis statistics vary, but a recent study indicates and incidence of approximately 18.1% (Disselkopf et al., 2013) but estimated rate for total population 7%. Link with more severe cognitive and sensory impairment — not typical ASD
- 10-15% of children with DS show atypical neurobehavioral symptoms such as hyperactivity and impulsivity, oppositional and disruptive behavior or stereotypic movement and autistic features

Studies of prevalence – ASD and DS

- Over past 25 years, some dozen papers have reported cases of children and adults with Down syndrome and autism. Also surveys in the UK and Sweden which suggest that about 5-7% of children with Down syndrome have ASDs. The site of the groups studied has varied widely as have the measures used.
- Recently some more rigorously studies have been carried out – Colorado team, DiLusso, Hepburn, Hiller
- 123 children, aged 2 to 11 years, Modified Checklist for Autism in Toddlers (M-CHAT) younger children - Social Communication Questionnaire for older children followed by the ADOS and ADI.
Autism and Down syndrome

- Confounded with more general brain damage, seizures
- Confounded with multiple and profound disability
- Symptoms are not a typical ASD pattern — social strengths and social engagement usually still evident
- Regression possibly 50% of cases and later (40-46 months) rather than 18-24 months, Castillo et al (2008)
- We need to understand the ‘ASD’ profile seen in children with DS in more detail — treatments could be different [Moss and Howlin]

Features of DS and ASD

- Significantly greater cognitive impairment — 67% have IQ below 40
  In the general population, 75% of people with ASD have IQ below 70
- 80% male some studies but Moss (UK study) no gender difference
  In the general population, 4:1 ratio of male to female
- Up to 50% show regression in language skills
  In the general population, 20-50% of children show regression of either language or social skills or both
- But new data appearing — Moss et al, UK and Colorado group suggest it is not typical autism. Continue to be more socially engaged. Moss — repetitive interests, rituals, preference for routine, attachment to objects some in non-DS group. Guilpapi paper — cautious on diagnosis.

Is it autism? Colorado team conclusions

- They say that these children usually presented with significant problems in communication and repetitive behavior; whereas their social style demonstrated less reciprocity than expected for their overall developmental level, core social relatedness was not impaired. The question remains: whether these children truly had an ASD, or whether cognitive, temperamental, attention, and motor factors combined to influence reciprocity and communicative development'. DiGuiseppi et al, p. 188.
- Is it executive function deficits? i.e., in planning, shifting attention, perseveration, cognitive inflexibility which affect social and communicative functioning - many items on screening tools tap aspects of executive function. P. 189

Is it autism?

- They suggest that children with inflexible behavioral styles or difficulty coordinating multiple behaviors may screen positive for autism and that further evaluation by an experienced clinician is necessary to disentangle executive dysfunction from poor social relatedness.
- They recommend that clinicians should supplement screening questionnaires with direct observation, attending to social orienting, communicative intentions, emotion contagion and other aspects of core social relatedness that differentiate autism from global developmental delay', p. 189.

Features of DS and ASD

- Usually early diagnosis on basis of repetitive behaviors or sensory issues despite social/emotional relatedness
- Many children with Down syndrome show repetitive behaviors (e.g., hand flapping) in the absence of any social or communication impairments
- Many children with severe/profound delay get labelled as 'autistic'
- DSE longitudinal study in progress to explore the early predictors of autistic behaviours

Aims of longitudinal study

- Track changes in behaviours diagnostic for autism
- Track range of onset of these behaviours and changes with time — to increase our ability to correctly diagnose and support from as early as possible
- 60 children recruited 18 to 42 months in 2008
- Bayley III assessments
- M-Chat - parent completed screening tool
- Toddler Temperament Scale
- Detailed sign and spoken language records
- Early Support Developmental Journals for babies and children with Down syndrome
Findings

- Number of children at risk decreases (16 to 9 to 3 by 5-6 years)
- The majority of children ‘at risk’ do not lack core social interactive skills at Time 2 – they point, show and attend to activities
- This is not typical ‘core’ autism and we need to consider what this means for interventions
- Repetitive behaviours decline with age
- Note that ‘stare and wander to no purpose’ and ‘oversensitivity to noise’ are common (35%) – and not specific to the ‘at risk’ group

Implications

- We need to further analyze our findings and follow the group further
- BUT – the majority of children ‘at risk’ do not lack core social interactive skills at Time 2 (differ to Colorado item data – may be intervention effect for our group)
- This is not typical ‘core’ autism and we need to consider what this means for interventions
- Our further analysis of the data on many aspects of these children’s development and health issues may enable us to clarify what is happening developmentally – especially on the cognitive and communication fronts – for these children and we want to see how the behaviours change over time

Early signs or risk factors

- ‘Red flags’ are based on observation of non-DS children who never develop ASD
- Failures to meet targets at 9-12 months for children with DS (2013)
- Lack of communication,1 pointing and joint attention
- Increased mouthing
- Increased self-stimulatory behaviours
- Increased physical body movements
- Increased activity – being ‘too good’
- Increased irritability
- Altered sensory responses
  - Hyperactivity to sound
  - Hypersensitivity to visual stimuli

Diagnosis of ASD

- A detailed assessment of cognitive level
- A detailed assessment of receptive and expressive language
- A developmental history with an Autism Diagnostic Interview
- Observation of the child in structured and unstructured settings – with a standardised autism diagnostic schedule
- Screening for medical/genetic conditions
- Consideration of other relevant psychosocial factors

Features of successful intervention - ASD

- Structured teaching programmes with emphasis on visual cues – for predictable and understandable environment; to limit confusion and distress
- Development of social communication and play activities especially with peers
- Acknowledge that behaviours reflect child’s behaviour repertoire and communication skills – so focus on skill enhancement
- Understand that obsessions and rituals
- Play a role in reducing anxiety
- Are powerful sources of motivation and reinforcement
**Intervention – Complex needs**

- Management of severe hearing loss, vision and other sensory issues
- Develop a daily routine and visual timetable to provide structure
- To allow child to anticipate what is expected
- Reduce anxiety
- Focus on encouraging communication skills
  - This may be in very small steps – any new skills will help
  - Remember to offer choices
  - Remember to respond to all attempts to communicate

- Encourage participation in meaningful activities at home – household chores, responsibilities, care of pets
  - Children with very limited self-occupation or play skills may be able to help with these, thus reducing time spent in repetitive or "self-stimulating" activities
  - Examples: laundry, laundry bin, putting up duvet to make the bed, taking dishes to kitchen or maybe in dishwasher, simple washing, ironing or other cleaning tasks, watering plants, potting plants, getting cups out for drinks for people, hand dryer use
  - Some of the meaningful tasks will also encourage independence and self-help
  - Examples: brushing hair, pouring cold liquid/drinks, using own lane, washing, dressing, sequences of activities for personal care for toilet,起Managing and managing

**Engagement in the community**

- Many of the activities mentioned previously can be through clubs or shared activities with people with and without learning difficulties
- Explore community opportunities with a social worker, if one is available to you
- Use Person-Centred Planning approaches – specifically for older children and young adults
  - This will lead you into methods for achieving goals
  - Groups of friends
  - Peer support – in and out of school
  - Use visual methods to facilitate the child's choices, an appropriate – taking mats
  - Explore community opportunities with the child's school

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Structured programmes for autism

- PCS - Picture Exchange Communication System
- Augmentative/alternative system that allows children and adults with autism and other communication difficulties to initiate communication
- No research available for children with Down syndrome
- TEACCH - The treatment and education of autistic and related communication handicapped children
- Develop a structure around the child's skills, interests and needs
- Organising the physical environment
- Developing schedules and work systems
- Making expectations clear and explicit
- Using visual materials

Practical resources

- http://www.downsyndromireland.org/resources/135/teaching
- http://www.downsyndromireland.org/resources/135/teaching

Resources

- TECIC resource: http://www.tecic.org
- PICs resources: http://www.pics.org
- Parent resources: http://www.teenage.net
- Autism and Developmental Delay in Young Children: The Sequential Teaching Curriculum for Parents and Professionals. Gerald Novel, Marie Novak, James MacDonald. From PHI 101 in IA.

References

Supporting speech development – early years SLT

Speech development – start early
- Starts early in typical development
  - In typical development, children are learning to discriminate sound in the first year of life – tuning in to native language
- High incidence of hearing loss
- Phonological difficulties
- Verbal short term memory difficulties
- Poor auditory processing
- Differences in anatomy and physiology
- SPEECH WORK MUST START EARLY – as research shows sound production ability influences first words in language development (Steel-Gammon 2011) - and continue through childhood
- Principles similar for older children

Links between speech and Verbal STM/ memory
- Phonological loop in working memory may have developed as a language acquisition device (Baddeley, Gathercole 1998)
- When learning a word, sound patterns needs to be held and stored
- Children with Down syndrome are poor at learning detailed phonological forms of words (Jarrold et al 2009)
- Speech sound development influences development of phonological working memory (Keren-Portnoy & al 2010)

What the research says about speech

- Children with Down syndrome
  - Babbling – mixed information in the research
    - more alike than different
    - babble period is much longer and transition to words takes longer
  - Phonology – mixed information in the research
    - Barbara Dodd – emergence of phonemes follows typical development
    - Libby Kumin – different emergence of phonemes
    - both agree – huge variability and lots of inconsistency in production
  - Recent study shows delay in phonological development increasing from stage of first 10 words – about 2 years of age (Solot, Fey 2013)
  - Intelligibility
    - 95% of individuals with Down Syndrome have speech sound production difficulty (Kumin 2006)

Phonological processes
- Some typical phonological processes seen
  - some atypical processes seen – e.g. backing, initial consonant deletion, use of non-English phonemes
  - error patterns persist for longer
  - more error patterns are present
  - errors are more inconsistent
  - fewer errors in imitated productions
  - greater delay than would be expected by mental age

Assessment of speech
- Due to inconsistencies, formal articulation tests are not a good indicator of mastery for children with Down syndrome and therapists should observe sound production in play and use of language in everyday social situations
- Articulation therapy should remain a high priority through childhood and adolescence as well as focus on segmental and suprasegmental aspects of speech
- Fluency, voice, prosody – have all been described as impaired with stuttering and or stammering: 10-45%, stuttering: 31%

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**Intervention**

**Listening practice**
- develop phonological system
- typically developing children develop this in first year of life
- children with Down syndrome need practice and repetition

**Practical activities**
- Sound cards
- Sound games (boo)
- Symbolic sounds (brmm-brmm, choo-choo, baa, moo)
- Talking/singing

**Film clip – early imitation – 4 months old**

**Film clip – sound cards – one year old**

**Film clip – discrimination – 2-1/2 years**

**Intervention**

**Discrimination**
- challenging the auditory system
- noticing subtle changes in sound
- refining the listening system

**Practical activities**
- noticing differences between similar sounds
- rhyming words/similar words

**Production practice**
- allows for voice exploration
- voice has power and meaning
- turn-taking for conversation – speaker/listener

**Practical activities**
- single sounds/sound cards
- babble
- symbolic sounds
- consonant+vowel combinations – ba, boo, bee
- simple words
- syllable marking – 1, 2, 3, 4 syllable words
Film clip – syllable marking – 4 years old

-- Image --

Intervention
Auditory bombardment – repetitive listening and/or production of a particular sound – in isolation or in a word
- draws attention to sounds in isolation, syllables and words
- production practice of sounds in isolation, syllables and words

Practical activities
- sound books
- sound boxes

Order of sounds is child-led by child's production

Some evidence this approach is effective for children with Down syndrome and can improve phonology quite quickly (see Dodd, Ní Cholmáin refs) See and Learn Saying Words kit based on this work.

Intervention studies
Barbara Dodd
Clotna Ní Cholmáin
Role practice and repetition – core vocabulary
Parent education/involvement
Certain phonological processes highlighted
Results
- all children in the programme showed a change in their phonological system within the first two weeks
- it is possible to accelerate the phonological development in young children with Down syndrome at language levels where this focus would not usually be deemed clinically appropriate

Film clip – auditory bombardment – 2 yr old

-- Image --

Film clip – auditory bombardment – 3 yr old

-- Image --

Intervention
Sorting by initial sounds in words
- listening practice – draws attention to initial sounds in words
- production practice – draws attention to sounds in words

Practical activities
- sound books/boxes – sorting by initial sound
- I spy.... Game

Note these are phonological awareness activities and will help speaking and reading
Film clip – initial sounds in words – 4 years old

Intervention

Letters and sounds
- Listening and production practice
- Foundations for phonics
- Visual prompt for production

Practical activities
- Sound cards and plastic letters
- Matching letters in words
- Sound blending – listening and production

Direct link with foundations for reading and supported by study by van Bysterveldt et al. (2013) – taught R4 and letter sounds and positive effect on speech

Film clip – CVC – beginning blending

See and Learn Speech

See and Learn Speech aims to improve speech discrimination skills and develop clearer speech production
- Structured, step-by-step program
designed specifically for young children with Down syndrome (from >6 months to >7 years old)
- Materials and guidance for activities
  (suitable for home, group and therapy settings)

Six steps (packs):
- Step 1 – playing with sounds
- Step 2 – putting sounds together
  Available
- Step 3 – saying words
- Step 4 – saying more words
- Step 5 – saying later words
- Step 6 – saying syllables in words
2014 – in kits and apps

See and Learn Playing with Sounds

- Listening to sounds and becoming familiar with sounds
- Hearing the differences between sounds (discrimination)
- Producing sounds in isolation
See and Learn Putting Sounds Together

Resources:
- Picture cards representing consonant-vowel combinations (e.g. bee, key, tea, pea, seal)
- Picture cards representing symbolic sounds (e.g. baa-m, baa-baa, choo-choo)
- Record sheets

Activities:
- Using sound cards and picture cards as visual cues to prompt production of sound combinations

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Oral motor skills

- Little is known about the link between oral-motor skills and speech skills. There is no evidence that interventions that target non-speech oral-motor skills benefit speech production.
- However, some basic oral-motor skills are necessary for speech e.g. jaw closure, lip rounding and tongue retraction.
- Any activities that promote these skills may be helpful and certainly won’t be harmful.
- Research in progress on this issue in UK (Alcock, Goody)

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Oral motor skills

Blowing
- breath support and breath control
- lip rounding/lip closure
Straw drinking
- Tongue retraction/building muscles
- Lip closure/lip rounding
Jaw Stability
- Jaw strength to support speech
- Mouth closure

Feeding

Promoting strength and mobility of the oral-motor structures

Practical activities
- spoon feeding – spoon straight in and straight out
- spoon feeding – putting food into cheek pockets to promote tongue lateralisation
- texture variety – moving on from puree
- bite and dissolve food – chewing
- seating position – promote stability

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Fluency

Contributing factors
- Physiological – genetic predisposition, processing; speech motor skills; reduced ability to link target to motor plan; structural issues; later milestones
- Linguistic/language – uneven language development; transition from lexical to grammatical based system; word length and complexity; word finding difficulties; dyspraxia
- Emotional – low self esteem; anxiety and/or excitement
- Environmental – communication demands; peer pressure; interaction style; reactions of others

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Interventions – fluency

- Young children
  - Identify what you are doing that supports fluency – keep a diary of times the child is fluent and times speech is less fluent
  - Identify any patterns (e.g. time of day, setting)
  - Reduce communication and environmental demands
- Older children
  - Broader focus of therapy (e.g. involve school, clubs, friends)
  - Improving general communication skills
  - Slow down rate of speech for many
  - Relaxation, breathing and posture
  - Speech practice through reading; conversation and picture description, singing

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References/Resources - speech

• DVD — Speech and Language activities for preschool children with Down Syndrome — available at www.downspeak.org.
• See and Learn Speech — see kits at US store http://store.downspeak.org/products/DownspeakUSA.

Intervention references


References - speech


References - speech


References - speech

What vision should underpin our work?

- We all have the potential to learn and develop across the life span from birth to old age
- Brains are not fixed at birth – the way the brain develops is influenced by input and activity from birth
- The important input is social – interaction with others
- In the family, school, work and wider community
- As we grow and learn we change at the biological, psychological and social levels
- Learning always involves brain change
- New skills increase self-esteem and confidence – they also increase social participation

Have high expectations – beliefs matter

Individuals with Down syndrome

- What matters for individuals with Down syndrome? How do we help them achieve their potential?
- Their development is influenced by the same things – family, education and wider community opportunities
- We can all make a difference but what do we focus on – what should be our priorities?
- I have told you about what I have learned wearing my professional hat as a psychologist supporting children, families and educators since 1970
- Now I want to tell you what my daughter Roberta with Down syndrome has taught me over the past 43 years.

Roberta’s life so far

- Born in September 1969
- Into institutional care at 5 weeks – ‘subnormality’ hospital
- I met her at 9 months of age
- Fostered at 16 months
- Adopted at 10 years
- Left home at age 22
- Partner at 23

Not a ‘high flier’ – late to walk and talk

- Standing at 22 months
- Walking with truck – 32 months
- Finally walked unaided at 46yrs
- First intelligible words at 5 yrs
- Born before right to go to school – law changed in 1971
- Went to an ESNS (educationally subnormal severe) school
- Day care – not education
- Segregation – on the bus
- Low expectations

Teenage years with family

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Teenage years – my worries? Mental age?
- Still limited language
- Not fully continent at night until 13 years
- Not reading or counting
- Some skills at ‘preschool’ level
- At 17 not able to write name legibly or tie laces
- Still needed help with personal care
- I saw only delights, delays
- I worried about the future

Roberta taught me to forget mental age and think chronological age at all times
- Roberta hit puberty, wanted to wear her jeans to school, sit with the boys in the bus, knew the pop groups watched the soaps – age appropriate interests, needs, behaviour but with limited language and less cognitive ability
- At 22 she fell in love and had a wonderful relationship for 5 years – still same emotions, needs and behaviour – she needs a bit more support, to live like you and I.
- A person with Down syndrome goes through life based on age – just like everyone else
- School at 5 years, puberty in early teens, out of school at 17 – the milestones are the same

Early 20’s – getting a life!

Roberta showed me the importance of expectations and beliefs
- Roberta did not join the ‘real world’ until she was 22 when she moved to supported living
- Staff treated her like a young woman of 22 – who just happened to have Down syndrome but who had a right to an ordinary life – and she met Andrew and got a life!
- Staff attitudes and having a partner changed her self esteem and self identity dramatically – and her skills – more progress from age 20-30 than in previous 15 years.
- With Andrew she had social independence – could plan her own life – go out without staff or family
- We understand who we are and our place in the world by the way we are treated.

Roberta and Mark – current partner

Roberta taught me not to underestimate understanding
- The biggest difficulty that most children and adults with Down syndrome face – on a daily basis - is not being understood because they cannot put into words all they know and want to say – imagine how that feels
- Since Roberta reached adulthood she has constantly surprised us with her understanding and competence
- The way she has managed her life and relationships
- The way she has coped in emergencies – Mark has been in hospital as an emergency admission twice – the only person who could keep him calm and get him to let the doctors help was Roberta. She even had procedures first to show him it was OK and sat with him for many days (she probably has an IQ of 30-40???)
What has helped Roberta to succeed?

- Social competence and confidence – an extrovert
- The ability to learn the social rules and behave in socially appropriate ways in different settings such as at home, in school, in church, in a cafe or on the bus – this requires the ability to control one’s emotions, impulses, desires and behaviour
- The ability to make friends and maintain relationships – this requires the ability to understand other people’s behaviour and feelings and react appropriately
- Social competence determines the quality of life of any person – and is not predicted by mental ability
- It is learned through social experience

What else would have helped her?

- Better spoken language
- Some literacy and numeracy skills – better education
- Full inclusion in school and community as a child
- We have made much progress on these issues since Roberta was a child
- Research has given us a much greater understanding of the effects of Down syndrome on development
- Allowing us to develop more effective early intervention and teaching methods
- Attitudes to disability have changed

Quality of life – the vision

- A right to independence, dignity and choice – an ordinary life
- Same needs as all children – the need to feel loved and valued – at home, at school and in the community
- Leading to a sense of security, self-esteem and confidence – a secure base from which to explore and learn
- A secure and loving family, brothers and sisters
- A stimulating and quality school environment
- Friends and a sense of belonging in the world of childhood in their communities – participation, inclusion
- Not isolation and exclusion as is still all too common

The priorities?

- Think ‘person first’ – see the child/person not the disability
- Think chronological not mental age
- Think self esteem and self identity – subtle expectations and feedback from everyone around
- Think social competence – it is learned through experience so requires social immersion/inclusion
- Think behaviour control – it is learned and begins at home
- Think communication – develop speech and language
- Think inclusion in education – and the value of literacy
- Remember the social strengths – build on these as all human development is social

Back to the big picture

- We all need to fight for the rights of our children to be fully included in the world of childhood
- We all need to enable adults with Down syndrome to be adult – independence, choice, work, partners – this last step is often hard for parents and depends on good services being available
- We all need to work to help them to be fully included in the social world, to have friends, take part in sports and leisure activities
- This is all starts with what we offer in early years and schools
- We all need to fight discrimination and prejudice in schools, communities and in wider society

Resources – Dsi series of books and videos

- A series on Adult issues is also available – edited by Roy Brown – and with an international team of authors
- All provide reviews of available research and guidance on evidence based practice.
- Available now by mail order from DSE see www.dsiinternational.org
- Electronic versions and some translations available