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Planning a Language Intervention for a Pupil with Down Syndrome

Pupils with Down syndrome, and especially those with moderate learning disabilities are hindered in their learning by significant issues with the acquisition of language. As a learning support teacher with a specific interest in this area, the author critically reviewed literature relating to language acquisition. Drawing on this review, an intervention which aims to improve communication skills is suggested.

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INTRODUCTION

There has been much research which investigates the language and communication difficulties of people with Down syndrome. Their language development has been viewed as 'developmentally lagging', with rates of acquisition better predicted by mental age than chronological age (Rosenberg, 1982). There are however contrary views. Chapman (1995, 1997) and Fowler (1995) suggest the existence of a specific language impairment relative to nonverbal cognition in children with Down syndrome. The emergence of early words, although it varies widely with chronological age, occurs at roughly the same mental ages in children with Down syndrome as in typically developing children (Cardosa-Martins, Mervis and Mervis, 1985). Expressive vocabulary, however, shows a slower rate of progress than mental age controls (Beeghly, Weiss-Perry and Cicchetti, 1990; Miller, Leddy, Miolo and Sedey, 1995). Early spoken words not only accumulate slowly but are often less intelligible (Pueschel and Hopmann, 1993; Kumin, 1994).Various interventions which have been developed to address this specific language need will be outlined here.

Naturalistic Intervention

There has been much support for the 'Naturalistic Intervention Approach' which aims to improve children's language skills, by setting up situations which are as close as possible to those in a natural setting and which provide the child with opportunities to use language in interactive processes (Norris and Hoffman, 1990; Tannock and Girolametto, 1992; Del Rio and Vilaseca, 2004). It is characterised

by being child-oriented, by following the child's lead and offering the child control over the communication. This approach relies more on natural language use than repetition or formal rehearsal. It is believed that this contextual approach better facilitates generalisation and maintenance, which are key issues in dealing with the language needs of children with learning disabilities.

Del Rio and Vilaseca (2004) found that the utterances of children with Down syndrome improved in length and complexity after a four month naturalistic intervention, where a therapist provided 'scaffolding' through expansions and corrective feedback in natural play situations. They accept, however, that there are limitations to their findings in that only three children took part in the intervention programme. Roberts, Price and Malkin (2007) further stress the need for generalisation. To this end, they feel that the child must have the opportunities to practise communication targets in the natural environment such as the home and neighbourhood. This view supports the findings of Del Rio and Vilaseca (2004), who found that there was a drop in post- treatment scores as a result of the sudden removal of the 'scaffolding'.

The Use of Music

Although children the world over seem to have an innate love of music, our understanding of the role it plays in facilitating speech and language learning is limited. Kouri and Winn (2006) examined how singing affects children's quick incidental learning of novel vocabulary terms. Sixteen children with language delay and mild developmental delays were presented with spoken and sung story scripts over two sessions. Children's naming and comprehension of target words did not significantly differ as a result of spoken versus sung scripts. They did, however, find that there was a significant increase in the number of unsolicited target word productions from session one to session two in the sung condition, indicating that sung input may only enhance particular aspects of quick incidental word learning. Significant advantages to the use of music in the teaching of lexical skills have also been reported by Madsen (1991) and Schunk (1999), who interestingly found that music paired with gestures, was more effective than gestures or spoken input alone in teaching nonsense and English vocabulary words.

Repetition

It has long been debated whether the linguistic abilities of individuals with Down syndrome are adversely affected by poor short-term memory, or whether it is their poor linguistic skills that actually hinder short-term memory. Brock and Jarrold (2004) studied the influence of language abilities on verbal short-term memory

performance in twenty-one individuals with Down syndrome and twenty-nine younger typically developing children. Their study suggests that Down syndrome is associated with a fundamental underlying deficit in verbal short-term memory, even when tasks are relatively insensitive to language influences or when language influences have already been accounted for. The significant difference in age and life experience between the two groups must of course be taken into account in considering these findings.

Baddeley's (1986) theory that verbal material is held in a limited-capacity phonological store, and decays rapidly unless it is refreshed by means of active rehearsal, means that repetition is surely an important component in all learning. This need for active rehearsal and repetition is of fundamental importance for children with Down syndrome in particular, because their short-term memory is already compromised.

Repeated Reading

Storybook reading has long been viewed as an important contributor to children's oral language development (Snow, 1983; Snow and Goldfield, 1983; Moerk, 1985; Sulzby, 1985), vocabulary development (Moerk, 1985), syntax (Snow and Goldfield, 1983) and decontextualised language (Sulzby, 1985). Kaderavek and Justice (2005) investigated the effects of parents being given one book per week over a ten week period, and being asked to read each book four times with their child. The four children with a language impairment who were involved in the study ranged in age from forty-nine to sixty-seven months with a mean age of five years. Six of the books used were narrative only, and the other four books were narrative plus manipulative, involving lifting flaps and unfolding illustrations. They found that all four children involved in the intervention demonstrated greater mean length of utterance during the reading of the manipulative storybooks. These findings seem to correlate with those of Madsen (1991) and Schunk (1999), in that the addition of gestures and activity seems to enhance the learning process. It also seems to support the naturalistic approach, in that the child uses language more freely when involved in a less directed interactive process such as lifting flaps in a storybook.

These findings are further supported by the work of Rabidoux and MacDonald (2000), who found that children with language impairment produced less child-initiated communication in response to more directive adult input during book reading, while less directive adult input appeared to promote child communication attempts. The children involved in the Kaderavek and Justice (2005) study also asked a higher percentage of questions during the manipulative storybook

interactions. This is significant, in that question asking is often a difficult linguistic skill for children with language impairment.

A wordless picture book 'Frog, Where are you?' (Mayer, 1969) was used to study the linguistic abilities of thirty-three individuals with Down syndrome ranging in age from twelve to twenty-six years, and three comparison groups, each consisting of thirty-three typically developing children (ranging in age from two to eight years), who were matched for mental age, syntax comprehension and mean length of utterance (Miles and Chapman, 2002). As with the work of Brock and Jarrold (2004), Miles and Chapman's study is limited by the significant difference of age between the group with Down syndrome and the typically developing comparison groups. Miles and Chapman felt that mean length of utterance was the best criteria for matching the comparison groups with the Down syndrome group, as any measure based on the use of grammatical words would underestimate the Down syndrome group's attempts at more complex structures, resulting in a match with even younger children. Their findings showed that despite their restricted expressive syntax and vocabulary, the group with Down syndrome expressed more plot line, thematic content and more than one of the protagonists' misadventures than the typically developing children. This resulted in the expression of more narrative content than previous measures of expressive language would have predicted. This ability to engage with story schemas makes storybooks a very appropriate tool in the development of the communication skills of children with Down syndrome.

A RATIONALE FOR AN APPROPRIATE APPROACH

It would seem that each approach has its merits in terms of improving the linguistic abilities of children with language impairments. However, while the naturalistic approach appears to lend itself most easily to generalisation of language acquisition, it would be difficult to follow through, as parents would need to be aware of the best methods of supporting the target language components.

The use of music to support language skills seems hugely appealing. The research, however, does not really offer any definite findings in respect of its support of vocabulary acquisition or comprehension.

Repeated reading as a form of language intervention seems to draw on the merits of many other approaches. The enjoyment of story is an integral part of childhood and engagement with story is a naturalistic form of teaching and learning in

classrooms. Children with Down syndrome can also engage with story schemas at a level higher than would be expected based on measures of their cognitive functioning (Miles and Chapman, 2002). Research has also shown that repetition and rehearsal must be employed, if information is to be retained (Baddeley, 1986), and that this repetition and rehearsal is especially important for children with Down syndrome in order to support their short-term memory deficits (Brock and Jarrold, 2004). The findings of Kaderavek and Justice (2005), as well as those of Rabidoux and MacDonald (2000) further strengthen the case for the use of storybooks in language interventions suggesting that interactive storybooks can lead to more questioning and longer utterances from the child. The use of story also lends itself to the inclusion of music and play. These added elements will further engage the child's interest and lead to a naturalistic intervention which attempts to achieve the maintenance and generalisation essential for long term success.

INTERVENTION

The focus of this intervention is a student named Laura, a girl with impaired language abilities. Much of her speech is babble with very few intelligible words. If Laura is asked to repeat what she has said, she will become quiet and will not speak again. If the listener guesses what she has said, she will always accept the guess, showing that she has no expectation of being understood. Her class teacher reports that she seldom makes any contribution in class and that her utterances are generally unintelligible.

A short-term (nine weeks) repeated reading intervention to improve the language skills of a nine year old pupil with Down syndrome is suggested here. The intervention will scaffold the use of target words and phrases, which may then be used generally so as to improve communication skills. The use of manipulative books will combine the rehearsal factor, with a less directed, more child-led communication. In order to encourage generalisation, links will be maintained with the classroom (Parsons, Law and Gascoigne, 2005) and home (Del Rio and Vilaseca, 2004; Roberts et al., 2007). Reading of storybooks to children, and following a child's lead with manipulative books is natural for parents (Justice and Kaderavek, 2002), therefore, continued 'scaffolding' of the target language at home would be possible. In choosing appropriate storybooks for this intervention, appealing illustrations and repeated phrases would be a priority. Based on the findings of Rabidoux and MacDonald (2000), as well as Kaderavek and Justice (2005), the books should also be activity based with flaps and illustrations.

The use of the Donaldson and Scheffler classic, 'The Gruffalo' seems like an obvious choice, as it is such a well-loved story with beautiful illustrations and repeated phrases. The clever and amusing storyline means that it will also appeal to the child's mainstream class. One version of the book, as well as having pictures and flaps to open, also has an engaging pop-up theatre at the back of the book. Two other stories by the same authors, 'Hide-and-Seek Pig' and 'Rabbit's Nap' could also be used for similar reasons.

Sample Storybook Session
Based on 'Hide-and-Seek Pig':

- The teacher (**T**) shows the front cover of the book to the pupil (**P**) and points to the pig asking **P** what she thinks Pig is looking for. If **P** makes no response, **T** will point to the hen, asking if Pig might be looking for the 'h……'. This use of both a *picture and phonemic cues* will hopefully lead the pupil to reply.
- **T** will also employ *binary choice* as a strategy in encouraging the pupil towards engagement. **T** could, for example ask **P** if Hen is swimming or hiding?
- If **P** answers 'hiding', this answer can be praised, and then *recast* by **T** into 'Yes, Hen is hiding'.
- **T** will then read the entire story, maintaining the *pulse* of the rhyming narrative.
- As **T** comes to the *repeated phrase* 'Where can she be?' she will *pause* and lean towards **P** to encourage her to chorus it with **T**.
- On the second and subsequent readings, **T** will also lean towards **P** for the phrases, 'Can you see a long brown ear?', 'Can you see a pair of feet? , 'Can you see a furry tail?' and 'Can you see a stripy nose?' As **P** becomes more familiar with the story, she will hopefully join **T** in *chorusing* these lines.
- While reading the story, **T** will pause so that **P** can lift the flaps. **T** will draw **P**'s attention to the illustrations and *model* commenting on what the characters are doing, for example 'Look Mouse is eating an apple!' This is intended to encourage **P** to engage in some unsolicited speech.
- **T** will model questions such as 'Who is behind the gate?', 'Who is in the tent?' All of **P**'s responses will be *accepted, praised* and *recast* if necessary.
- As **P** becomes more and more familiar with the book, **T** will pause for longer at each illustration. This extra time and lack of comment

from the teacher will hopefully encourage **P** to use some of the language that she now associates with the story.

Collaboration

In order for this intervention to be successful, it is necessary that the presentation of the books be as consistent as possible, with a predictable approach being adopted by all involved. To this end, the resource teacher will meet with the mainstream class teacher and special needs assistant (SNA) (if applicable) to discuss the books, and agree on the most appropriate style of presentation.

The child's parents can then be invited to a short meeting with the resource teacher, where strategies to maximise the opportunity for both phrase repetition and unsolicited speech can be discussed. The parents should be provided with a copy of the sample storybook session based on 'Hide-and-Seek Pig'. This will act as a reminder of some strategies for when they are reading at home with their child. They can keep a record of any unsolicited utterances, such as exclamations or questions, which occur during the storybook session at home. Any generalised use of the storybook language in a different context can also be noted. At the end of the intervention period, the parents can be invited to attend a meeting with the resource teacher, class teacher and SNA, where opinions on the successes and challenges of the intervention can be shared.

Detailed Plan of Implementation

Phase 1: Week one (Collaboration).

The resource teacher meets with the class teacher and SNA to explain the intervention, and discuss a uniform approach to the use of repeated gestures/actions. The resource teacher then meets with the child's parents to explain the intervention.

Phase 2: Weeks two, three and four.

In the second week, the resource teacher reads 'The Gruffalo' with the child each day in the resource session. The agreed approaches with regard to actions etc. are adhered to, as well as the consistent use of strategies such as binary choice, picture and phonemic cues, recasting, maintaining the pulse, pausing, chorusing, modelling and praising as outlined in the sample storybook session. The child and the resource teacher also spend five minutes each day engaging with the pop up theatre. The teacher will initially prompt the child as to what her character should say, but will, as the days pass, leave longer pauses to encourage the child to independently speak for each character. Each day, the SNA also reads the book

with the child, and engages with the theatre, following the same approach used by the resource teacher.

On Friday of the second week, the class teacher reads the book with the class. She again follows the agreed approach with which the child is now familiar. Children are invited to come up in pairs to chorus the phrases and do the actions with the teacher. The target child will hopefully experience a sense of ownership with the story, and will be confident enough to attempt the phrases and actions with a partner. The SNA might then supervise children as they come in pairs to play with the pop up theatre.

The same procedure in followed in weeks three and four in the reading of 'Hide-and-Seek Pig' and 'Rabbit's Nap', with the class sharing the book on Fridays. The SNA might again supervise children in pairs as they take turns engaging with the books.

Phase 3: Weeks five, six and seven.
In the fifth week, we return to book one, 'The Gruffalo'. We follow the same procedures as previously. At this stage, however, the child is invited to take the book home each night to share with his/her family. The child will, by then hopefully feel like an expert on this book, and can chorus the phrases and gestures at home.

In the sixth and seventh week, we return to 'Hide-and-Seek Pig' and 'Rabbit's Nap'. The books are again covered each day with the resource teacher and SNA, being brought home each night also. They continue to be shared with the class each Friday.

Phase 4: Weeks eight and nine (Evaluation and Review).
In week eight, as the intervention ends, the resource teacher, class teacher and SNA should meet to evaluate its effectiveness. Daily records based on observations of how the child engaged with the books should be shared. Any unsolicited speech such as utterances in response to flap lifting, contributions made while playing a character in 'The Gruffalo' theatre and so on, should be reported to the others. This should be followed by a meeting with the parents, where all observations from home and school are shared. Specific language improvements will be recorded so that all involved can continue to support generalisation of this language in the child's natural environment. Suggestions on any improvements which may lead to increased effectiveness are also recorded for use in any subsequent language interventions.

Naturalistic play sessions in resource sessions and at home will go a long way towards supporting the generalisation of the target language. To this end, the resource teacher will engage the child in play sessions involving some of the characters and objects from the stories. A toy hen could be made to eat, swim, sleep, and hide and so on. Teacher can model phrases such as 'hen is eating' or 'hen is swimming'. The child can then hold the hen and choose what she wants to make it do. The repeated phrase 'Who is behind the gate?' and 'Who is in the tent?' could be supported by hiding a toy hen, rabbit or mouse in/under/behind/on objects. The teacher will ask 'Who is behind the gate/ book/door?' and the child will guess and then physically check. The child can then be encouraged to hide the toys and attempt to ask the question herself, while the teacher guesses. These and similar activities can also be incorporated into natural play at home.

CONCLUSION

An ability to communicate is the basis for all social interaction. Therefore, if we, as educators, are to foster the inclusion of all children, we must surely see the development of communication skills as a priority. Specific difficulties in the area of language and communication mean that children with Down syndrome are at particular risk of being excluded. Every activity must therefore be manipulated to encourage the child towards meaningful communication. The intervention described above aims to incorporate strategies such as repetition and rehearsal which will result in the child generalising language as they begin to initiate communication based on a text. While accepting that on-going support to address short-term memory deficit will remain necessary, the ultimate goal of generalisation of language can be achieved by providing continued scaffolding and also encouragement from the child's school, home and community.

Further information including a list of books suitable for the intervention is available from the author at irenewalsh90@gmail.com.

REFERENCES

Baddeley, A.D. (1986) *Working Memory,* Oxford, England: Oxford University Press.

Beeghly, M., Weiss-Perry, B. and Cicchetti D. (1990) Beyond Sensorimotor Functioning: Early Communicative and Play Development of Children with Down Syndrome. In Ciccheti, D. and Beeghly, M. (Eds.) *Children with*

Down Syndrome: A Developmental Perspective, Cambridge UK: Cambridge University Press, pp. 329-368.

Brock, J. and Jarrold, C. (2004) Language Influences on Verbal Short-term Memory Performance in Down Syndrome: Item and Order Recognition, *Journal of Speech, Language, and Hearing Research,* Vol. 47 (December), pp. 1334-1346.

Cardosa-Martins, C., Mervis, C.B. and Mervis, C.A. (1985) Early Vocabulary Acquisition by Children with Down Syndrome, *American Journal of Mental Deficiencies*, Vol. 90 (2), pp.177-184.

Chapman, R.S. (1995) Language Development in Children and Adolescents with Down Syndrome. In Fletcher, P. and MacWhinney B. (Eds.) *Handbook of Child Language*, Oxford: Blackwell, pp. 641-663.

Chapman, R.S. (1997) Language Development in Children and Adolescents with Down Syndrome, *Mental Retardation and Developmental Disabilities Research Reviews*, Vol. 3 (4), pp. 307-312.

Del Rio, M.J. and Vilaseca, R.M. (2004) Language Acquisition by Children with Down Syndrome: A Naturalistic Approach to Assisting Language Acquisition, *Child Language Teaching and Therapy,* Vol. 20 (2), pp. 163-180.

Fowler, A. (1995) Linguistic Variability in Persons with Down Syndrome: Research and Implications. In Nadel, L. and Rosenthal, D. (Eds.) *Down Syndrome: Living and Learning in the Community*, New York: Wiley-Liss, pp. 121-131.

Justice, L.M., and Kaderavek, J.N. (2002) Using Shared Storybook Reading to Promote Emergent Literacy, *Teaching Exceptional Children,* Vol. 34 (4), pp. 8-13.

Kaderavek, J.N. and Justice, L.M. (2005) The Effect of Book Genre in the Repeated Readings of Mothers and their Children with Language Impairment: A Pilot Investigation, *Child Language Teaching and Therapy*, Vol. 21 (1), pp. 75-92.

Kouri, T.A. and Winn, J. (2006) Lexical Language in Sung and Spoken Story Script Contexts, *Child Language Teaching and Therapy*, Vol. 22 (3), pp. 293-313.

Kumin, L. (1994) Intelligibility of Speech in Children with Down Syndrome in Natural Settings: Parents' Perspectives, *Perceptual and Motor Skills*, Vol. 78 (1), pp. 307-313.

Madsen, S.A. (1991) The Effect of Music Paired with and without Gestures on the Learning and Transfer of New Vocabulary: Experimenter-derived Nonsense Words, *Journal of Music Therapy,* Vol. 28 (4), pp. 222-30.

Mayer, M. (1969) *Frog, Where Are You?* New York: Dial Press.

Miles, S., and Chapman, R. (2002) Narrative Content as Described by Individuals with Down Syndrome and Typically Developing Children, *Journal of Speech, Language, and Hearing Research*, Vol. 45 (1), pp. 175-189.

Miller, J.F., Leddy, M., Miolo, G. and Sedey, A. (1995) The Development of Early Language Skills in Children with Down Syndrome. In Nadel, L. and Rosenthall, D. (Eds.) *Down Syndrome: Living and Learning in the Community*, New York: Wiley-Liss, pp.115-121.

Moerk, E.L. (1985). Picture-book Reading by Mothers and Young Children and Its Impact upon Language Development, *Journal of Pragmatics*, Vol. 9 (4), pp. 547-566.

Norris, J.A. and Hoffman, P.R. (1990) Language Intervention within Naturalistic Environments, *Language, Speech and Hearing Services in Schools,* Vol. 21, pp. 72-84.

Parsons, S., Law, J. and Gascoigne, M. (2005) Teaching Receptive Vocabulary to Children with Specific Language Impairment: A Curriculum Based Approach. *Child Language Teaching and Therapy*, Vol. 21 (1), pp. 39-59.

Pueschel, S. and Hopmann, M. (1993) Speech and Language Abilities of Children with Down Syndrome: A Parent's Perspective. In Kaiser, A. and Gray, D. (Eds.) *Enhancing Children's Communication: Research Foundations for Intervention*, Baltimore: Brookes, pp. 335-362.

Rabidoux, P. and MacDonald, J. (2000) An Interactive Taxonomy of Mothers and Children during Storybook Interactions, *American Journal of Speech-Language Pathology,* Vol. 9 (4), pp. 331-344.

Roberts, J.E., Price, J. and Malkin, C. (2007) Language and Communication Development in Down Syndrome, *Mental Retardation and Developmental Disabilities Research Reviews,* Vol. 13 (1), pp. 26-35.

Rosenberg, S. (Ed.) (1982) *Handbook of Applied Psycholinguistics*, Hillsdale, NJ: Erlbaum.

Schunk, H.A. (1999) The Effect of Singing Paired with Signing on Receptive Vocabulary Skills of Elementary ESL Students, *Journal of Music Therapy,* Vol. 36 (2), pp. 110-124.

Snow, C.E. (1983) Literacy and Language: Relationships during the Preschool Years. *Harvard Educational Review*, Vol. 53 (2), pp. 165-189.

Snow, C.E., and Goldfield, B.A. (1983) Turn the Page Please: Situation-specific Language Acquisition, *Journal of Child Language,* Vol. 10 (3), pp. 551-569.

Sulzby, E. (1985) Children's Emergent Reading of Favourite Storybooks: A Developmental Study, *Reading Research Quarterly*, Vol. 20 (4), pp. 458-481.

Tannock, R. and Girolametto, L. (1992) Reassessing Parent-focused Language Intervention Programs. In Warren, S.F. and Reichle, J. (Eds.) *Causes and Effects in Communication and Language Intervention*, Baltimore, MD: P. Brooks, pp. 49-79.