

Neurodevelopmental Therapy  
East Adelaide Medical Centre  
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Adelaide SA 5000

***“Learning To Listen - Listening To Learn”***

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**Australian School Pilot Study  
The Listening Program® (TLP)  
Karoonda Area School – South Australia**

**Introduction**

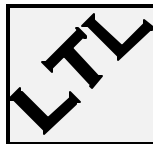
**Report of the first formal study conducted by Anne Clarke and Tracey Butler (Links to Learning) into the effects of using The Listening Program® with a group of students in a school setting in 2003.**

The Listening Program® is a Music-Based Auditory Stimulation method that was developed by Advanced Brain Technologies as a means of enabling participants to improve their auditory skills needed to effectively listen, learn, and communicate.

Anne Clarke and Tracey Butler undertook Authorized Provider training in the use and delivery of The Listening Program (TLP) in 2002 and from this developed their interest in the applications of TLP. Anne and Tracey had been using the program with individual clients in the form of home based intervention. As a classroom teacher with over 20 years experience, Anne was keen to test the efficacy of The Listening Program and its practical application in a school or group setting.

The Listening Program involves participants listening to a series of music-based auditory stimulation CDs through high-quality headphones.

This study was undertaken at Karoonda Area School (Kindergarten – year 12 campus). Karoonda is situated 130 km from Adelaide, the capital of South Australia, and is an agricultural region. The majority of the students live on farms and catch a



bus to school, with some travelling up to 70 km a day. The population of the town and the surrounding district is 1300.

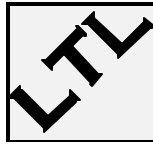
All the children speak English at home and they also study Indonesian as a second language.

Teachers and support staff at the school provide active assistance for students and their development. The school has been proactive in setting up special programs, including a sensory program, to help support children with learning difficulties. Despite the success of these programs, some of the students still displayed learning difficulties and auditory problems.

Debra Bridge, the special education coordinator, noted some positive changes in two students who were using The Listening Program at home. Upon meeting with the boys' mother, Debra learned about TLP and contacted Anne and Tracey for further information. Debra then approached Nigel Gill, the school principal, for funding to trial TLP at Karoonda Area School in third term, 2003.

Twenty students (11 boys and 9 girls), aged from 5 to 10 years of age were identified to take part in the trial. This was done with full parental support. Parents were invited to an information session, where the program was discussed and questions answered. The parents were happy to be part of the assessment process and took home a "Changes To Look For At Home" checklist, which they completed during the trial. Some of their comments are included in this report. Teachers completed a "Changes To Look For In The Classroom" checklist.

The school year in Australia consists of four terms and begins in January. The trial took place in Term 3, a 10 week period from mid July to late September.



**Tests Administered**

The following assessments were used as a formal means of tracking the students' progress. Pre testing was carried out at the end of Term 2. Post assessments were carried out at the beginning of Term 4.

- **QNST – Quick Neurological Screen Test, Version Two**

This screening instrument comprises 15 tasks and it is used with children aged 5 and upwards, to assess areas of neurological integration as they relate to learning. Performance scores are grouped into one of three categories – Normal Response, Moderate Discrepancy, and Severe Discrepancy.

Scores shown in the results are the total of all subtests.

- **SCAN-C**

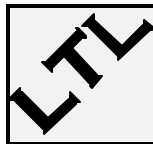
The Test for Auditory Processing Disorders in Children. This screen test is used to determine auditory development in children between the ages of 5 – 11 years. It identifies efficient and inefficient auditory processing performance in this age group.

Filtered Words – interpreting distorted speech at or below 750 Hz

Auditory Figure Ground – interpreting speech in the presence of background noise

Competing Words and Competing Sentences – interpreting speech when presented to the two ears simultaneously. These subtests reflect the level of auditory maturation of the listener.

Scores are shown in graph format using percentile rankings. Subtest scores are also ranked and noted as borderline or disordered, should they fall outside the normal range. A composite ranking is shown as well. Composite rankings that are below 14 are considered borderline or disordered.



- **Auditory and Visual Digit Span, BrainBuilder®**

Digit span measurement is a way to check sequential processing abilities. Sequential processing is our ability to receive, hold, process and utilise information in an orderly way. Sequential processing ability is an aspect of short-term memory, which is essential to learning and every mental process, including verbal communication. An individual's digit span typically increases approximately one digit per year for every year until the age of 7. BrainBuilder® software was used as a controlled digit span assessment.

- **Primitive Reflex Testing** (Institute of Neurophysiological Psychology).

The series of sub tests reflects the degree of retained primitive reflexes. According to Sally Goddard from The Institute For Neuro-Physiological Psychology, there is a link between retained reflexes and an immature central nervous system, which can lead to difficulties with gross and fine motor co-ordination as well as sensory perception, cognition, and avenues of expression.

All subtests are scored from 0 – 4, with

- 1) 0 = no abnormality detected
- 2) 1 = evidence of primitive reflex to 25%
- 3) 2 = residual presence of a primitive reflex to 50%
- 4) 3 = virtually retained primitive reflex to 75%
- 5) 4 = retained primitive reflex, 100%

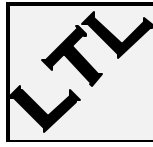
Scores shown are a total of all subtests.

- **LAC – Lindamood Bell Auditory Conceptualization Test**

Used as an individualised test designed to measure auditory perception and conceptualisation of speech sounds.

Scores are shown as either:

1. at recommended minimum for age or
2. below recommended minimum for age

**Equipment and Setting**

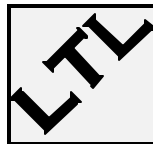
Listening was carried out in a quiet alcove of a classroom block. The students listened in pairs, twice a day for 15 minutes at each session, using two Sony anti-skip CD players, headphone splitters (allowing two headphones to be run off one CD player) and AKG301 headphones.

The students began with 2 weeks preparatory listening using the Sensory Integration Classic CD, followed by one week each of TLP CDs 1-8. The Base Schedule of two 15 minute sessions per day from Monday to Friday was followed. Due to the very tight listening schedule, the students had no opportunity to up catch up on missed sessions caused by factors such as illness or excursions. The total listening time was 25 hours.

The students were encouraged to listen actively and were given the opportunity to draw, colour, or engage in fine motor activities whilst listening. This was done in order to facilitate greater compliance and support the sensory program that many of the children were taking part in.

**Overview**

There were two aims for this pilot program. First and foremost it was anticipated that the students would gain substantial benefit from taking part in TLP. The second and broader aim was to generate an interest in TLP and provide locally produced results, demonstrating the efficacy of The Listening Program in Australian schools as a method of addressing some of the underlying causes of learning difficulties.



**Individual Results**

**Student A (girl 5 years)**

Learning related issues: Dyslexia, auditory processing, slow progress and development

A also took part in the sensory program for fine motor, concentration, and listening skills.

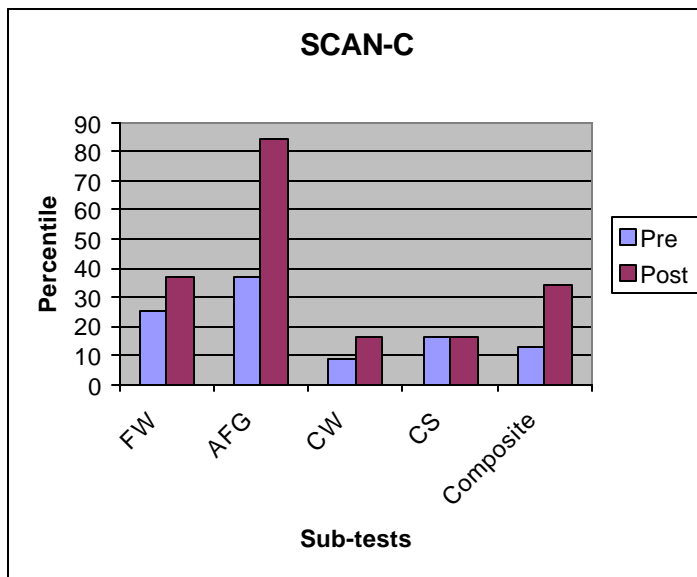
**Primitive Reflexes** Pre 3  
Post 1

**Digit Span** Pre Visual 2 Auditory 2  
Post Visual 4 Auditory 3

**LAC** Unable to complete due to distractibility

**QNST** Pre 35 Moderate discrepancy  
Post 25 Normal response

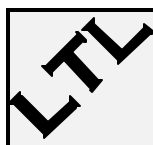
**SCAN-C**



A's results showed that she made substantial gains in 3 subtests, with auditory figure-ground being the most significant, rising from 37<sup>th</sup> to the 84<sup>th</sup> percentile.

Overall composite score for SCAN rose from 13<sup>th</sup> percentile (borderline) to 34<sup>th</sup> percentile (normal).

Her ability to attend to tasks without prompting, during post testing, was much greater. Her teachers have also reported that A is more settled and less distracted in class. No formal feedback from home.



**Student B (boy 6 years)**

Learning related issues: Poor speech and language skills, slow progress in literacy, auditory and visual difficulties, NEP – speech and language

B is involved in the sensory program for coordination, fine motor skills, attention and interaction.

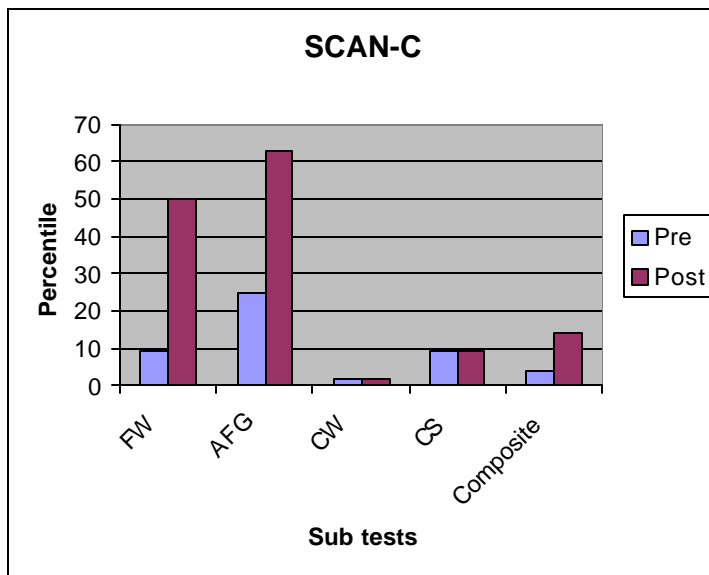
**Primitive Reflexes** Pre 7.5  
Post 5

**Digit Span** Pre Visual 2 Auditory 3  
Post Visual 3 Auditory 2

**LAC** B did not complete this assessment

**QNST** Pre 13 Normal response  
Post 8 Normal response

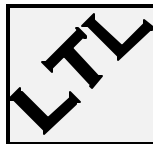
**SCAN-C**



B's results show improvements, especially filtered words (9<sup>th</sup> to 50<sup>th</sup> percentile) and auditory figure-ground (25<sup>th</sup> to 63<sup>rd</sup> percentile). B's overall SCAN score whilst still within the borderline range rose from the 4<sup>th</sup> to 14<sup>th</sup> percentile.

His parents noted there were some physical, mental, and numerous emotional changes at home (e.g., more communication, better sense of rhythm, more appropriate interactions with adults and peers, more independent, improved attention span).

At school his teacher felt that he was more settled in some areas but easily distracted during writing tasks.



**Student C (girl 6 years)**

Learning related issues: Poor speech, language skills, slow progress in literacy, NEP – language

C is involved in the sensory program for coordination, fine/gross motor skills, attention and social interaction.

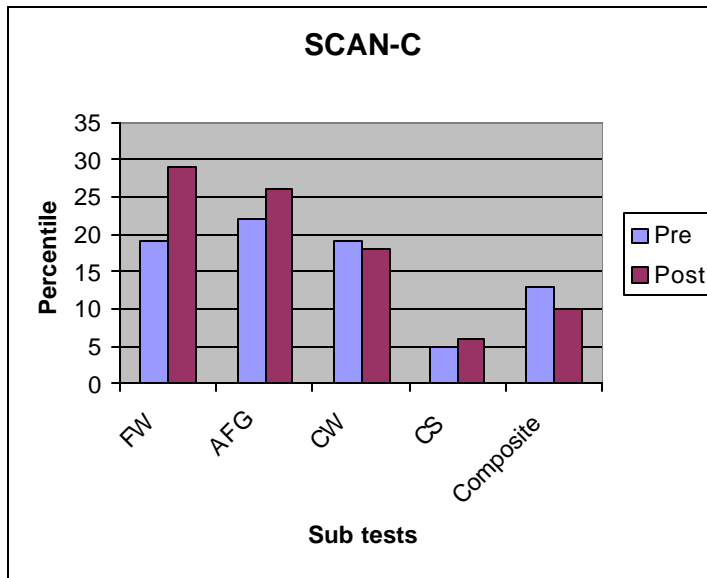
**Primitive Reflexes** Pre 7  
Post 4

**Digit Span** Pre Visual 4 Auditory 3  
Post Visual 4 Auditory 4

**LAC** Pre 20 below recommended minimum for age  
Post 31 below recommended minimum for age

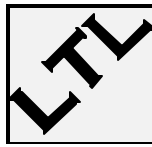
**QNST** Pre 35 Moderate Discrepancy  
Post 24 Normal response

**SCAN-C**



Whilst C’s post TLP test results are modest, her parents have reported that they have noticed “large improvements in her behaviour”, and her reading is more fluent.

The class teacher believes that C’s confidence in her own reading and writing has improved and she is working more independently. C displayed improvements in QNST, where her overall score took her from moderate discrepancy to normal response and her auditory digit span improved by one year.



**Student D (boy 8 years)**

Learning related issues: Auditory processing, visual processing, dyslexia, poor concentration

D is involved in the sensory program for fine motor skills, attention, concentration and social interaction.

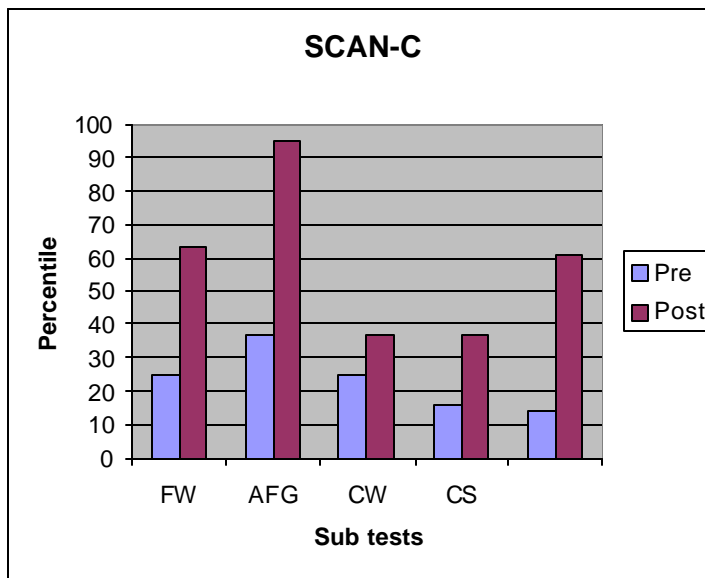
**Primitive Reflexes** Pre 4.5  
Post 2

**Digit Span** Pre Visual 3 Auditory 3  
Post Visual 5 Auditory 4

**LAC** Pre 40 below recommended minimum for age  
Post 70 below recommended minimum for age

**QNST** Pre 2 Normal response  
Post 2 Normal response

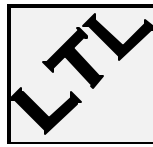
**SCAN-C**



D's results show improvements in many areas. Digit span scores showed a 2 year rise in visual and 1 year in auditory. Scan-C results showed substantial improvements in 3 out of the 4 subtests. Filtered Words percentile ranking rose from 25<sup>th</sup> to 63<sup>rd</sup> percentile, auditory figure-ground from 37<sup>th</sup> to 95<sup>th</sup> percentile and competing sentences from 16<sup>th</sup> to 37<sup>th</sup> percentile. The composite ranking went from the 14<sup>th</sup> percentile (borderline) to 61<sup>st</sup> percentile (normal).

Whilst he is still below the minimum recommended for his age, D's LAC score rose 30 points, which is equivalent to a 2 year increase.

D's parents marked 30 positive changes on the Changes To Look For At Home form, including more talking/communication, less confusion of left and right, increased self confidence, new friends, quicker response time. His teacher noted that while D is more focused in class, his behaviour is still "over the top".



**Student E (boy 7 years)**

Learning related issues: Behaviour related issues, as well as delays in literacy and processing

E is involved in the sensory program for fine/gross motor skills, attention, concentration and social interaction.

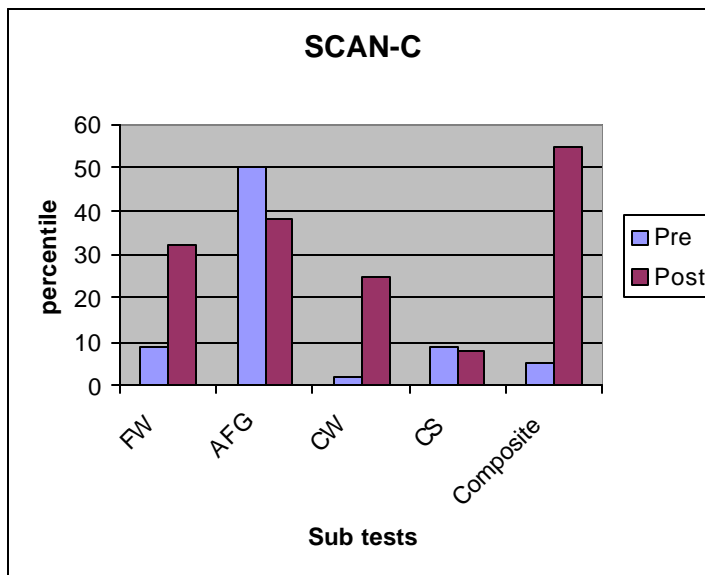
**Primitive Reflexes** Pre 8.5  
Post 8

**Digit Span** Pre Visual 3 Auditory 3  
Post Visual 3 Auditory 3

**LAC** Unable to complete

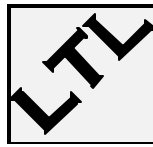
**QNST** Pre 36 Normal response  
Post 36 Normal response

**SCAN-C**



Whilst E did not make any improvements in any other assessments, his SCAN-C results show significant improvements in his ability to process speech. Filtered words percentile ranking rose from 9<sup>th</sup> (borderline) to 37<sup>th</sup> percentile (normal), competing words rose from 2<sup>nd</sup> (borderline) to 25<sup>th</sup> percentile (normal). His overall score rose from the 5<sup>th</sup> (borderline) to 55<sup>th</sup> (normal) percentile.

His teacher felt that E's behaviour became more negative during the program. E has a history of emotional related issues. It may well be that he is now more aware of these issues and is attempting to express himself in the only way he knows how.



**Student F (boy 8 years)**

Learning related issues: Inability to stay on task, hyperactive tendencies, listening difficulties

F is involved in the sensory program for fine motor skills, attention, concentration difficulties, and to learn self-calming techniques.

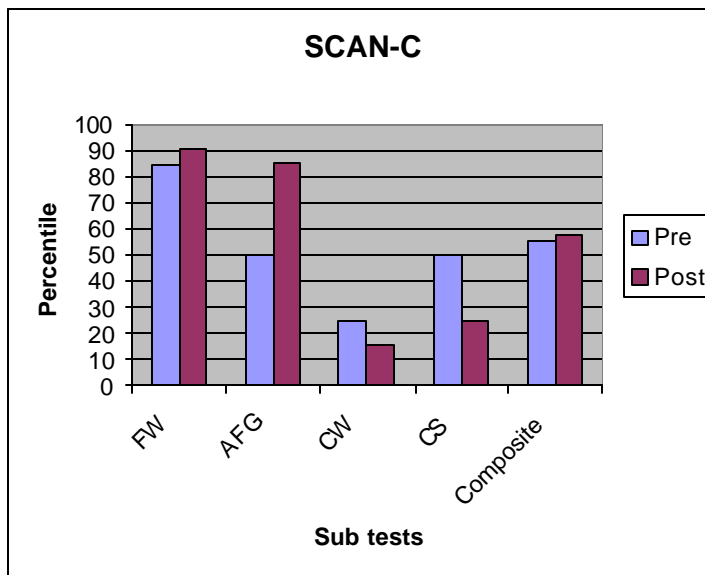
**Primitive Reflexes** Pre 3  
Post 0

**Digit Span** Pre Visual 5 Auditory 5  
Post Visual 5 Auditory 5

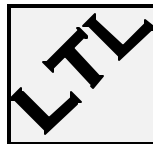
**LAC** Pre 84 Above recommended minimum for age.  
Post 93 Above recommended minimum for age.

**QNST** Pre 18 Normal response  
Post 4 Normal response

**SCAN-C**



F made progress in motor related areas as seen in his QNST results and modest improvement in his auditory processing, especially in the area of auditory figure ground. His teacher and parents did not notice any changes during the trial period.



**Student G (boy 7years)**

Learning related issues: Behaviour and concentration issues

G is involved in the sensory program for general benefits.

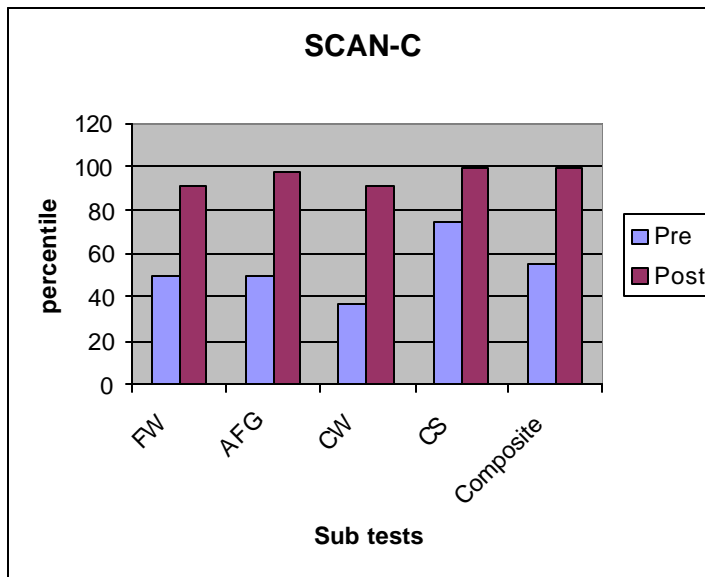
**Primitive Reflexes** Pre 6  
Post 4

**Digit Span** Pre Visual 4 Auditory 2  
Post Visual 4 Auditory 4

**LAC** Pre 93 Above recommended minimum for age.  
Post 100 Above recommended minimum for age.

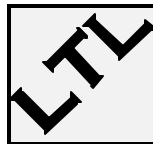
**QNST** Pre 22 Normal response  
Post 18 Normal response

**SCAN-C**



G's SCAN-C results reflect an almost perfect ability to process sound without distortion. Whilst pre testing showed him to be within the normal range (55<sup>th</sup> percentile) on the SCAN-C test, post testing revealed positive movement (66<sup>th</sup> percentile). He displayed a 2 year improvement in auditory digit span.

His parents did not notice any changes and his teacher reported that G became more impulsive during the program.



**Student H (girl 7 years)**

Learning related issues: Poor comprehension of verbal and written instructions

H is involved in the sensory program for general benefits.

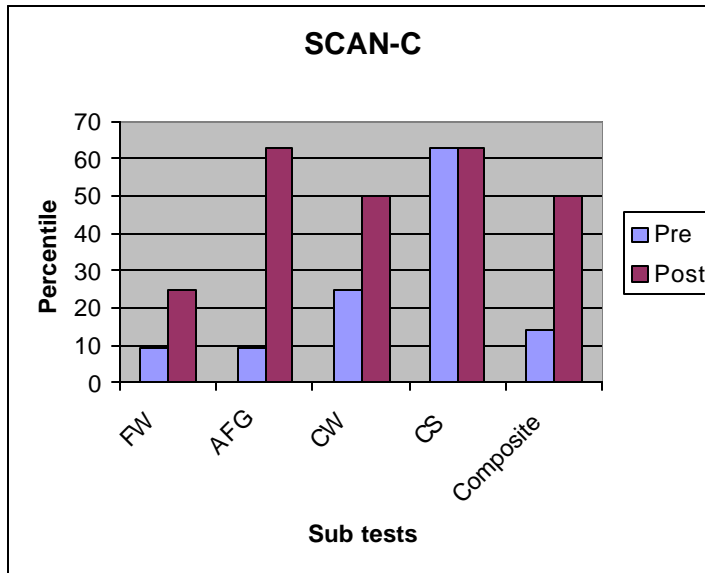
**Primitive Reflexes** Pre 5.5  
Post 3

**Digit Span** Pre Visual 4 Auditory 3  
Post Visual 4 Auditory 4

**LAC** Pre 51 Below recommended minimum for age.  
Post 51 Below recommended minimum for age.

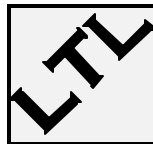
**QNST** Pre 16 Normal response  
Post 16 Normal response

**SCAN-C**



Despite the fact that neither parents nor her teacher noticed any changes, H’s auditory processing abilities appear to have been greatly enhanced, as shown in SCAN-C results. Auditory figure ground results are significant, with her pre TLP percentile ranking being 9<sup>th</sup> (borderline) and post at 34<sup>th</sup> (normal). Overall composite percentile ranking was 14<sup>th</sup> (borderline) initially and at post testing was 50<sup>th</sup> (normal).

H’s parents did comment that their daughter enjoyed being involved in the program.



**Student I (boy 9 years)**

Learning related issues: Poor comprehension of verbal and written instructions

I is involved in the sensory program for general benefits.

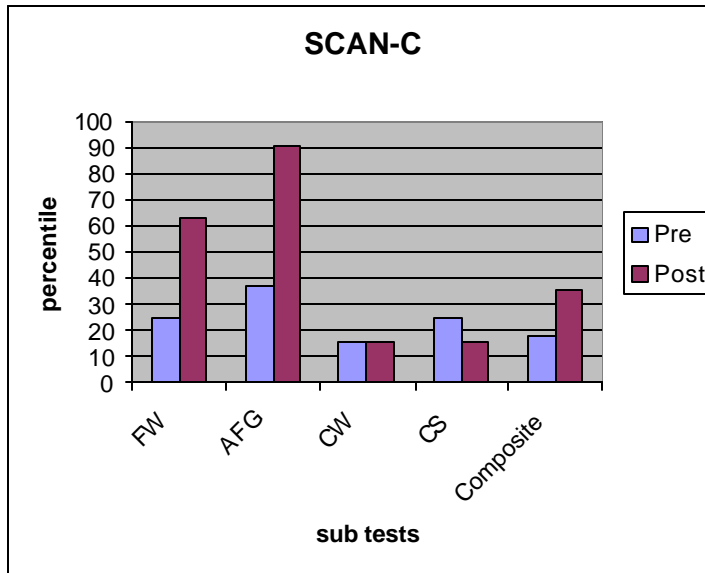
**Primitive Reflexes** Pre 5.5  
Post 3

**Digit Span** Pre Visual 6 Auditory 4  
Post Visual 4 Auditory 4

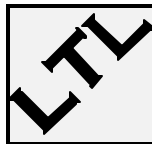
**LAC** Pre 54 Below recommended minimum for age.  
Post 51 Below recommended minimum for age.

**QNST** Pre 3 Normal response  
Post 0 Normal response

**SCAN-C**



The changes noted were in ability to understand distorted speech and attending to speech in the presence of background noise. I's teacher commented that it was only in the last few weeks of the program that positive changes were seen, i.e. improved focus, better at beginning and completing tasks, and more motivated.



**Student J (girl 6 years)**

Learning related issues: Slow progress, auditory and visual processing

J is involved in the sensory program for fine/gross motor skills, interaction, and instruction following.

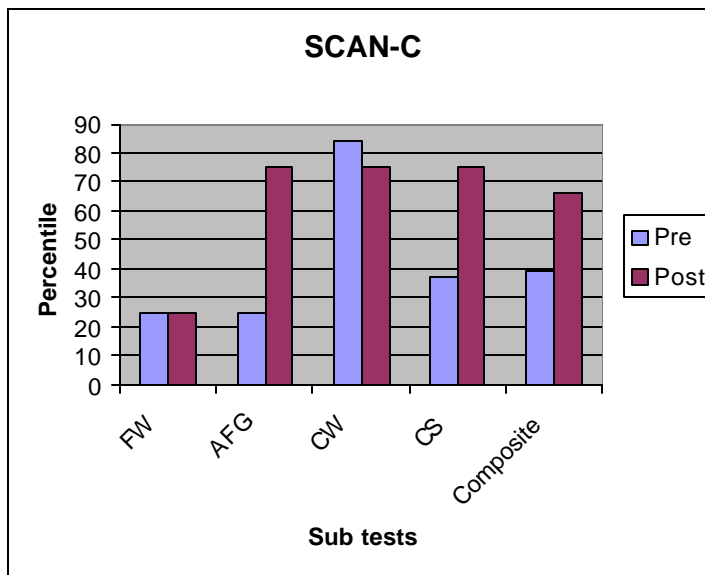
**Primitive Reflexes** Pre 2  
Post 1

**Digit Span** Pre Visual 3 Auditory 4  
Post Visual 5 Auditory 4

**LAC** Pre 64 At recommended minimum for age.  
Post 94 Above recommended minimum for age.

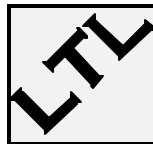
**QNST** Pre 13 Normal response  
Post 10 Normal response

**SCAN-C**



J's results reflect an overall improvement in auditory processing abilities, especially in the area of auditory figure ground. Her ability to discriminate and conceptualise phonemes has also been enhanced, as seen by her LAC score, which rose approximately 3 years.

At home her parents noticed many changes including more physically active, more talking/communication, increased sense of humour, more affectionate, and improvements in spelling.



**Student K (boy 6 years)**

Learning related issues: Dyslexia and slow progress in general

K is involved in the sensory program for general benefits.

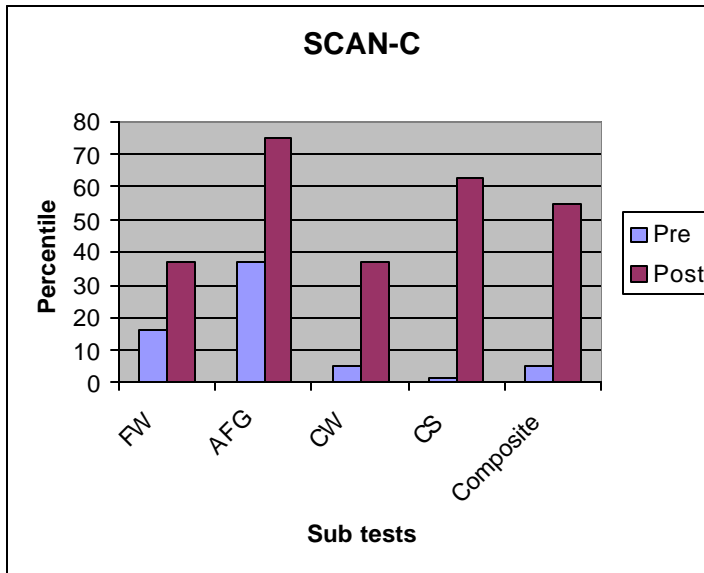
**Primitive Reflexes** Pre 11.5  
Post 9

**Digit Span** Pre Visual 4 Auditory 3  
Post Visual 4 Auditory 4

**LAC** Pre 55 Below recommended minimum for age.  
Post 55 Below recommended minimum for age.

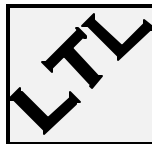
**QNST** Pre 23 Normal response  
Post 18 Normal response

**SCAN-C**



These results show very significant changes in K's ability to perceive sounds without distortion. His overall percentile ranking initially was borderline at 5. After 10 weeks of listening, his score rose to the 55<sup>th</sup> percentile. All areas assessed by SCAN-C displayed significant changes, suggesting that there has been maturation of his auditory system.

At home only a few changes were noted in the physical area. No changes were noted at school.



**Student L (boy 7 years)**

Learning related issues: Slow progress at school in general, auditory processing and concentration difficulties

L is involved in the sensory program for attention, social interaction, and co-ordination.

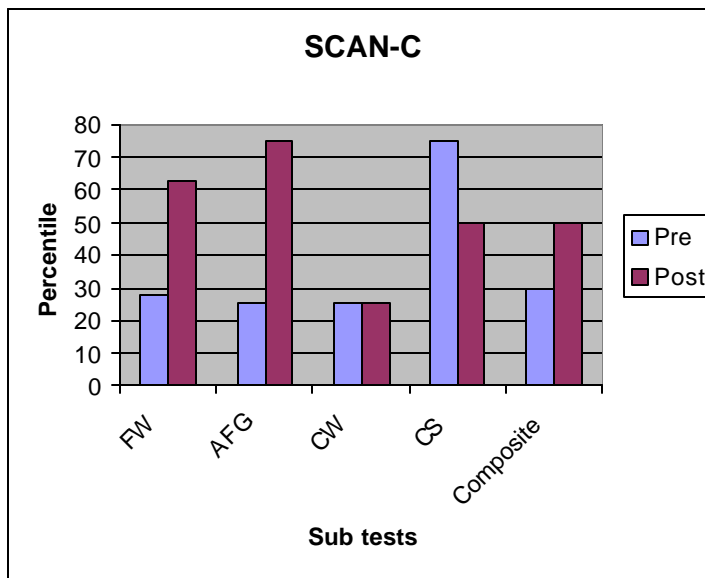
**Primitive Reflexes** Pre 11.5  
Post 7

**Digit Span** Pre Visual 3 Auditory 4  
Post Visual 6 Auditory 5.5

**LAC** Pre 39 Below recommended minimum for age.  
Post 51 Below recommended minimum for age.

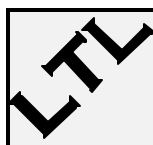
**QNST** Pre 28 Moderate discrepancy  
Post 22 Normal response

**SCAN-C**



It should be noted that towards the end of the post assessment in SCAN-C, L became distracted by outside noises and he showed signs of being very tired. Despite this his results show significant improvements in filtered words and auditory figure ground. Another area of notable improvement was digit span, which rose 3 years for visual, and auditory by 1.5 years.

Whilst his teacher noted only a few changes, his parents were delighted with the changes. They noted L will now come home from school and busy himself in writing stories and undertaking maths problems. This was unheard of before.



**Student M (boy 6 years)**

Learning related issues: Speech, language and literacy, NEP – speech and language

M is involved in the sensory program for social interaction, learning and auditory processing.

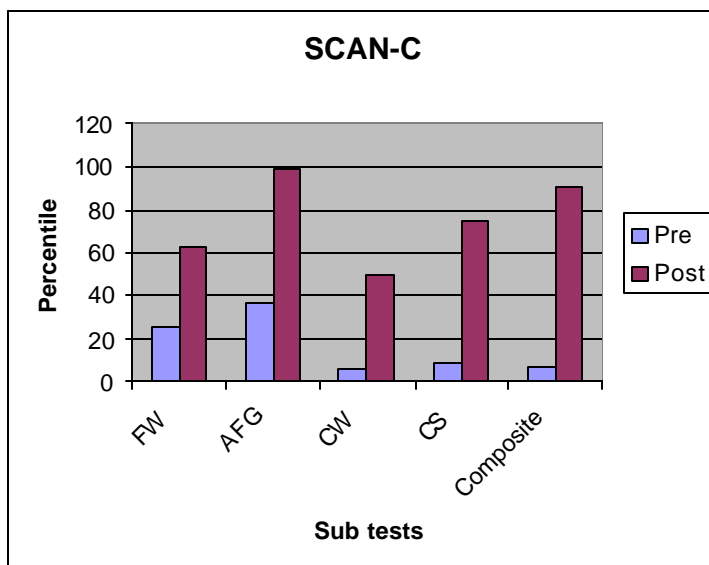
**Primitive Reflexes** Pre 6  
Post 6

**Digit Span** Pre Visual 2 Auditory 3  
Post Visual 3 Auditory 3

**LAC** Pre Not tested  
Post 28 Below recommended minimum for age.

**QNST** Pre 21 Normal response  
Post 21 Normal response

**SCAN-C**

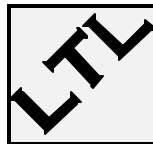


M's SCAN-C results reflect significant change. Both competing words and competing sentences pre TLP sub-tests suggested immaturity of the central auditory system. At pre testing his ranking for both subtests was borderline. Post testing revealed both subtests percentile ranking were well within the normal range. His composite percentile ranking rose from 7<sup>th</sup> (borderline) to 91<sup>st</sup> (normal). These results suggest that his ability to understand speech without distortion would now be very high.

In the SCAN-C pre testing it was noted that M's responses in competing words and sentences subtests were often blended together. Post testing revealed that this difficulty has virtually been eliminated.

His teacher noted that his classroom behaviour had improved and he was generally more patient with others, displayed increased self confidence, and had developed better self help skills.

His parents felt that M had made numerous positive changes in the mental and physical areas but had become more moody.



**Student N (girl 8 years)**

Learning related issues: Slow progress in general, lacking in confidence and literacy

N is involved in the sensory program for social interaction, learning and auditory processing.

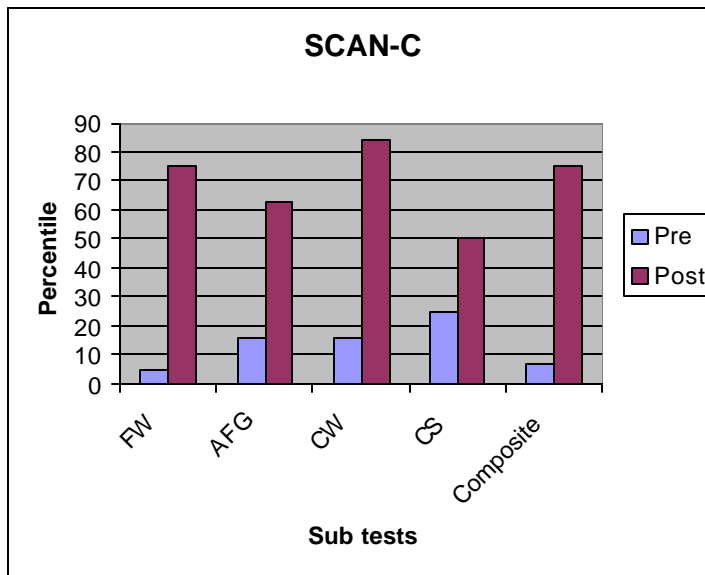
**Primitive Reflexes** Pre 9  
Post 4

**Digit Span** Pre Visual 4 Auditory 4  
Post Visual 5 Auditory 5

**LAC** Pre 45 Below recommended minimum for age  
Post 88 Above recommended minimum for age

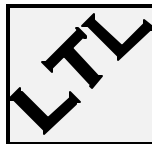
**QNST** Pre 3 Normal response  
Post 3 Normal response

**SCAN-C**



These results show very significant changes in N's ability to perceive sounds without distortion. Her overall percentile ranking initially was borderline at 7. After 10 weeks of listening her ranking was 75. Her LAC scores rose approximately 3 years.

N's parents noted that she became more affectionate and needier emotionally during the trial period. No changes were noted in the classroom.



**Student O (girl 8 years)**

Learning related issues: Slow progress in general, auditory and visual processing

O is involved in the sensory program for coordination, attention, and auditory processing.

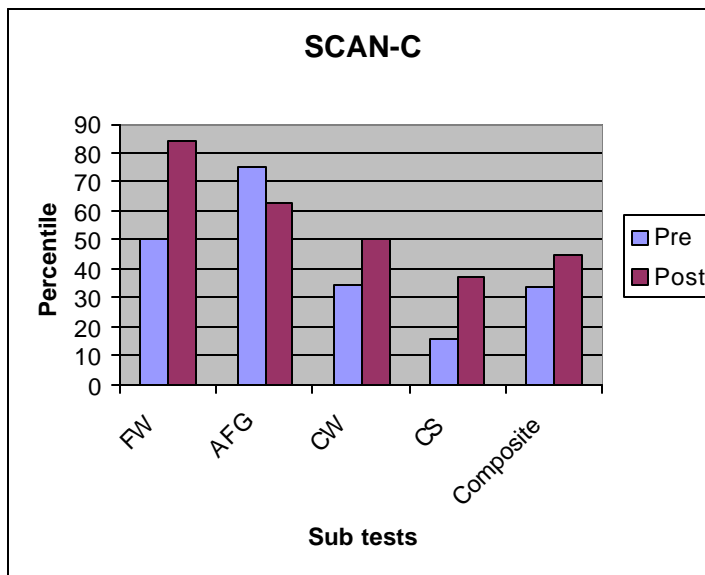
**Primitive Reflexes** Pre 5  
Post 1

**Digit Span** Pre Visual 2 Auditory 3  
Post Visual 4 Auditory 3

**LAC** Pre 37 Below recommended minimum for age  
Post 40 Below recommended minimum for age

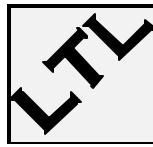
**QNST** Pre 13 Normal response  
Post 3 Normal response

**SCAN-C**



O's ability to recall visual information appears to have been enhanced during the trail period. Initially during the digit span testing her recall was poor with a score of 2 and many reversals were noted. At post testing reversals were not evident and her score rose by 2 years to 4.

Despite her parents and teacher not noticing any changes, O herself felt that she had benefited from the program. She stated that she slept better, had less confusion about left and right, improved writing, felt more confident, and could concentrate for longer periods of time.



**Student P (girl 9 years)**

Learning related issues: Slow progress in literacy, auditory and cross dominant.

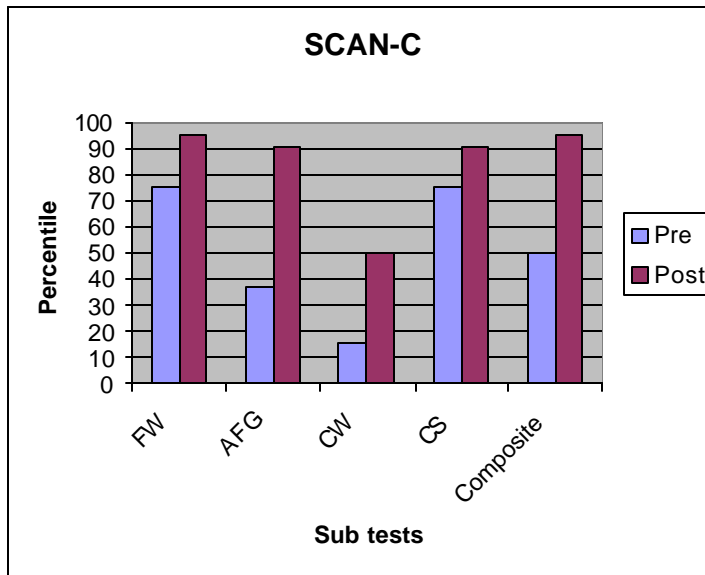
**Primitive Reflexes** Pre 2  
Post 0

**Digit Span** Pre Visual 5 Auditory 5  
Post Visual 6 Auditory 5

**LAC** Pre 76 Below recommended minimum for age  
Post 82 Below recommended minimum for age.

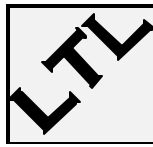
**QNST** Pre 6 Normal response  
Post 0 Normal response

**SCAN-C**



These results show significant changes in P's ability to perceive sounds without distortion. Auditory figure-ground scores rose from the 37<sup>th</sup> to 91<sup>st</sup> percentile. Her overall percentile ranking initially was 50<sup>th</sup> percentile. After 10 weeks of listening her ranking was now on the 95<sup>th</sup> percentile.

Her teacher felt there was little change in the classroom. P's parents noted that she was calmer and less emotional and is at times more compliant with requests at home.



**Student Q (girl 9 years)**

Learning related issues: Slow progress in general, auditory and visual processing, as well as interpersonal difficulties.

Q is involved in the sensory program for fine/gross motor, attention, interaction, and confidence.

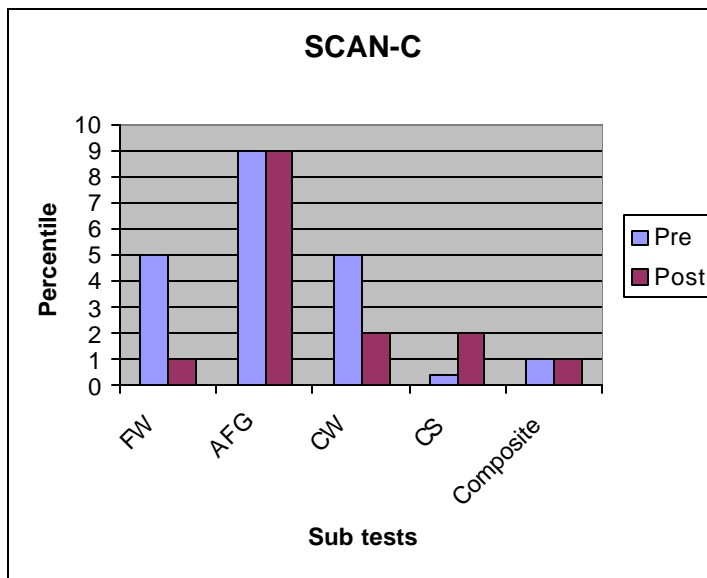
**Primitive Reflexes** Pre 13.5  
Post 10.5

**Digit Span** Pre Visual 2 Auditory 3  
Post Visual 3 Auditory 5

**LAC** Pre 40 Below recommended minimum for age.  
Post 73 Below recommended minimum for age.

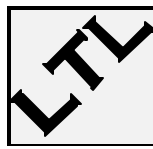
**QNST** Pre 23 Normal response  
Post 19 Normal response

**SCAN-C**



In Q'S SCAN-C results it should be noted that her total number of correct responses were the same pre and post testing. Her age at post testing was one year older than at pre-testing, thus her results reflect a drop in percentile ranking for 2 subtests. Overall her results are still in the disordered range. Her digit span scores in auditory recall rose by 2 years as did her LAC results.

No changes were noted at home or school.



**Student R (girl 9 years)**

Learning related issues: Slow progress in general, auditory and visual processing, as well as cross dominant

R is involved in the sensory program for interaction and cross dominance.

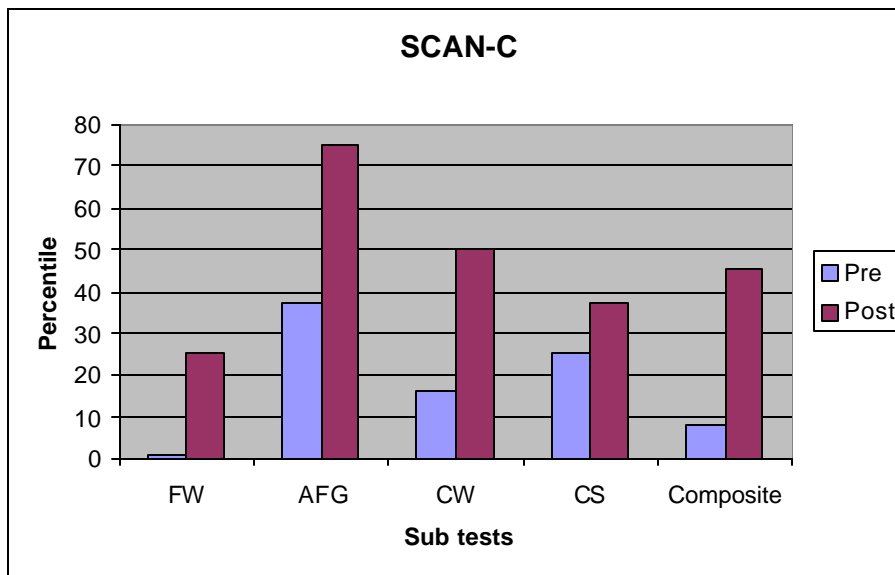
**Primitive Reflexes** Pre 12  
Post 4

**Digit Span** Pre Visual 5 Auditory 4  
Post Visual 5 Auditory 5

**LAC** Pre 66 Below recommended minimum for age  
Post 79 Below recommended minimum for age

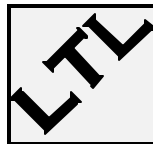
**QNST** Pre 15 Normal response  
Post 12 Normal response

**SCAN-C**



R's SCAN-C scores reflect positive changes in all 4 subtests. Filtered Words pre score was disordered at the 1<sup>st</sup> percentile, while post testing was on the 25<sup>th</sup> percentile. Her composite ranking rose from the borderline range on the 8<sup>th</sup> to the 45<sup>th</sup> percentile, which is considered normal. Her ability to perceive sounds without distortion has been significantly enhanced. Her auditory digit span and LAC scores improved by one year as well.

There were no comments from home and her teacher saw little change in the classroom.



**Student S (boy 10 years)**

Learning related issues: Slow progress in auditory and visual processing.

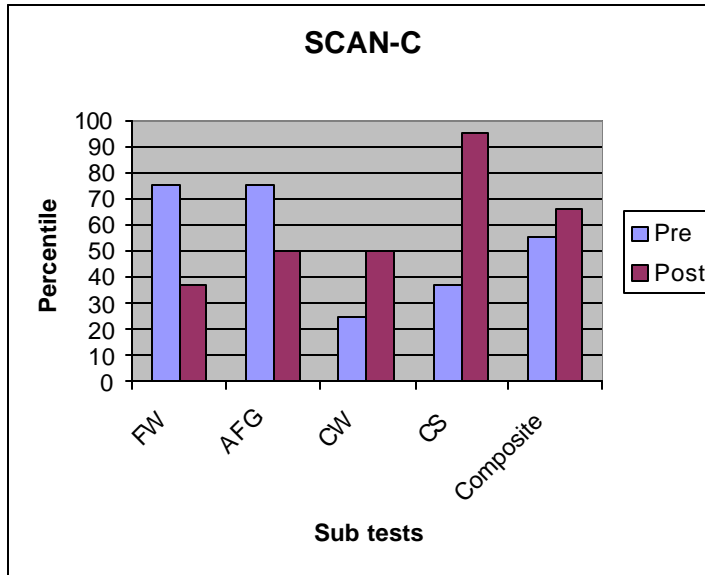
**Primitive Reflexes** Pre 5  
Post 1.5

**Digit Span** Pre Visual 5 Auditory 5  
Post Visual 5 Auditory 5

**LAC** Pre 64 Below recommended minimum for age  
Post 82 At recommended minimum for age

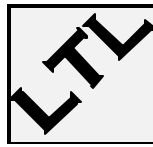
**QNST** Pre 2 Normal response  
Post 0 Normal response

**SCAN-C**



Despite recording a lower score on two subtests, S's overall percentile ranking rose from 55<sup>th</sup> to 66<sup>th</sup> percentile. His LAC results indicate that he is now more equipped to discriminate phonemes.

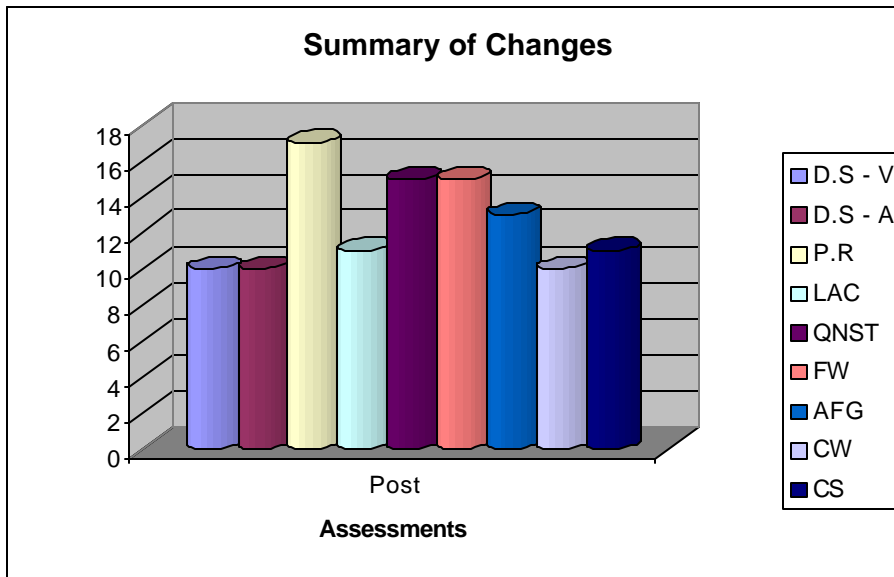
The classroom teacher has stated that the program was most beneficial for him, noting that he has shown many positive changes emotionally and mentally. S is more motivated, displays a longer attention span, does not need instructions repeated as often and disrupts others less often.



**RESULTS**

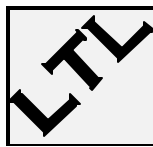
Note: At the time of post TLP testing one child was absent from school and therefore his results are not included in this report.

**Summary of Changes**



The graph above gives an overall view of the changes that were noted after the trial period. For each child who demonstrated positive changes in any one assessment, one point was assigned.

From this graph it would appear that the greatest changes were realized in areas of primitive reflexes, neurological readiness for learning, and filtered words, auditory figure-ground, and auditory maturation.

**Conclusion**

After preparatory listening and one cycle of The Listening Program® (25 hours) by 20 children, aged from 5 to 10, all the children displayed positive changes from having taken part in the school trial. Whilst, according to parents and teachers, there were some students who did not appear to have gained benefits from the program, evidence from post testing did reveal positive gains for all participants.

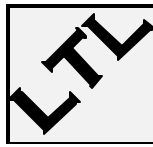
Some of the students realized significant improvements in their ability to process auditory information, as seen in results from SCAN-C. Filtered words and auditory figure ground were the subtests where students showed the greatest changes, from an auditory point of view. This would suggest that the children would now have a greater ability to understand speech in an acoustically compromised environment and be able to focus on a speaker in the presence of distracting background noise. Many children showed maturation of their auditory systems as seen in greater ability to decipher dichotic speech as reflected in the results from Competing Words and Competing Sentences.

Significant changes were seen in the reduction of neurological inefficiencies that may have been inhibiting the children's ability to learn. Lower scores in Primitive Reflex and QNST scores reflect this.

More than half of the children displayed greater ability to discriminate and conceptualize sounds, as seen in LAC results.

Digit Span scores improved in just under 50% of the students, with some realizing significant increases over the 10 week period.

The results from this trial indicate that The Listening Program has been of benefit in assisting students to improve their auditory processing abilities. It should be remembered that most of the students took part in a sensory program as well. When one is subjected to sensory stimulation, be it auditory, visual or tactile for example, of enough frequency, intensity and duration, neurological change will most likely take place.



Recommended minimum listening times for the initial cycles of TLP are now set at 40 hours. Thus the students at Karoonda have as yet not completed the recommended two listening cycles, which are each 20 hours.

From anecdotal evidence reported by parents, there appear to have been improvements in emotional well-being, and the development of more appropriate intra-personal and interpersonal skills for some participants.

We would sincerely like to thank Debra Bridge, Special Education Teacher, and Nigel Gill, Principal, class teachers, school service officers, and parents for their support in conducting this trial.