

## EFFICACY OF A STRUCTURED TRAINING PROGRAMME FOR THE PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDERS

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## AUTISM - DEFINITION

Autism is an umbrella term with the following triad of impairments in :

<b>Reciprocal social interaction</b>	<ul style="list-style-type: none"> <li>Have difficulties in social communication and social timing.</li> </ul>
<b>Verbal and nonverbal communication</b>	<ul style="list-style-type: none"> <li>Lack understanding of how to initiate communication and respond to joint attention, and difficulties in imitating others and playing with toys.</li> </ul>
<b>Restricted range of imaginative activities</b>	<ul style="list-style-type: none"> <li>Difficulty in organizing their responses and difficulty in inhibition of repetitive behaviors and interests.</li> </ul>

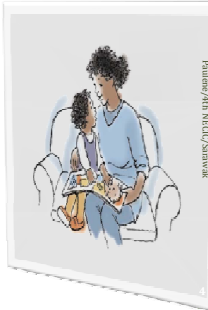
(Wing, 1988)

## INTERVENTION APPROACHES


Behavioral	Social-Pragmatic Developmental	Cognitive
<ul style="list-style-type: none"> <li>- Applied Behavioral Analysis (ABA)</li> <li>- Picture Exchange Communication System (PECS)</li> <li>- Treatment and Education of Autistic and Communication-handicapped Children (TEEAACH)</li> <li>- Pivotal Response Treatment (PRT)</li> </ul>	<ul style="list-style-type: none"> <li>- Hanen approach</li> <li>- Milieu method</li> <li>- Focused Stimulation, Social Stories</li> <li>- Relationship Development Intervention (RDI)</li> <li>- Social Communication and Emotional Regulation and Implementing Transactional Support (SCERTS)</li> </ul>	<ul style="list-style-type: none"> <li>- Sensory Integration Therapy</li> </ul>

## PARENT TRAINING

- Parents as “co-therapists”
- Increased skills, renewed confidence and reduced stress for parents
- Parental group training facilitates mutual support (Baxendale et al, 2001)
- Studies showing parents as primary implementers associated with positive outcomes




## WHAT DOES LITERATURE SAY?



Author	Training for parents	Duration	Outcome
Harris et al (1981)	Implementation of speech and language intervention with behavior modification	10 weeks	significantly more speech skills than pre-intervention
Dawson & Galpert (1990)	to teach imitative and toy play	2 weeks	increased interest in social interaction
Zapella (1990)	ethologically oriented family therapy	2 years	40% displayed increased cognitive functioning and decreased autistic behavior

## WHAT DOES LITERATURE SAY?



Author	Training for parents	Duration	Outcome
Robbins and Dunlop (1992)	need identification – behavior management	3 months	problem behavior significantly reduced
Jocelyn et al (1996)	to teach language and social skills	12 weeks	significantly better in language skills overtime.
Ozonoff & Cathcart (1998)	to teach language, imitation and pre-academic skills using structured and visual orientation	10 weeks	significantly better performance in 5/8 subtests on a developmental profile.

## WHAT DOES LITERATURE SAY?



Author	Training for parents	Duration	Outcome
Mahoney & Pearles (2003)	Relationship- Focused intervention to enhance the social-emotional functioning	1 year	Improvement in children's attention, persistence, joint attention and initiation
Aldred, Green & Adams (2004)	to respond sensitively and to interpret child's actions as having meaning	1 year	Increased reciprocal social interaction and responsiveness and significant increase in expressive vocabulary
McConachie et al (2005)	More Than Words	20 hours	Children had larger reported vocabularies; parents were able to apply facilitation strategies.

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## WHAT DOES LITERATURE SAY?



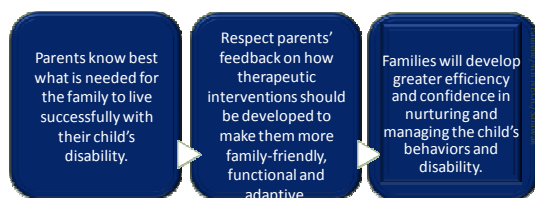
Author	Training for parents	Duration	Outcome
Girolametto, Weitzman & Sussman (2007)	More than Words	20 hours	Parents showed increased use of responsive interaction strategies; Children demonstrated increase in vocabulary development and social interaction.

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## FAMILY CENTERED APPROACH

Principles of Family-Centered Services acknowledge that:



Chong, W.H., Goh., Tang, H.N., Chan, W.P. & Choo, S. 2011 (in press)

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## SERVICE MODEL

- In Singapore, the family centered approach has been strongly recommended by the National Council of Social Service (NCSS) and the Ministry of Community Development, Youth and Sports (MCYS).
- SCAS is moving towards adopting the family-centered approach across all the programmes.

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## Programmes at SCAS

- Early Intervention Programme For Infants and Children (EIPIC)
- Spastic Children's Association School
- Goodwill, Rehabilitation and Occupational Workshop (GROW)
- Day Activity Centre (DAC)
- Out Patient and Home Management
- Rehabilitation Centre
  - Physiotherapy
  - Occupational therapy
  - Speech and Language Pathology
  - Social Work
  - Psychology

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## EARLY INTERVENTION PROGRAM FOR INFANTS AND CHILDREN

- Its aim is to maximise the developmental growth of each child by providing holistic and individual developmental programmes for the child and to prevent and minimise the risks of secondary disabilities through support and training for child and family.
- Currently, EIPIC provides intervention to about 207 infants and children with special needs.
  - CP-21
  - GDD- 75
  - ASD-73
  - T21-19
  - Speech & Language delay- 12
  - Others-7
- Most of these children would receive rehabilitation therapy services from Department of Physiotherapy, Occupational therapy and Speech & Language Pathology depending on the need of each child.

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### NEED FOR THE CURRENT STUDY



1

To investigate the effectiveness of parent-administered intervention in the Singapore context.



2

To document and validate the outcome of a structured parent training program, such as Hanen: More Than Words for parents, as SCAS is moving towards adopting the family centered service model.

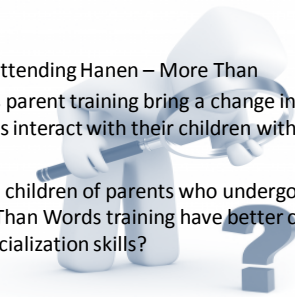
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### RESEARCH QUESTIONS

- Does attending Hanen – More Than Words parent training bring a change in the way the parents interact with their children with ASD?
- Do the children of parents who undergo the Hanen – More Than Words training have better communication and socialization skills?



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## METHOD



### OBJECTIVE


The study investigated the impact of Hanen More Than Words program on:

- ✓ Parents' use of responsive interaction strategies
- ✓ Child's vocabulary and Mean Length of Utterance
- ✓ Social interaction skills between the parent and child

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### Participants Inclusion Criteria




- ✓ Parents of children with confirmed diagnosis of ASD by a Registered Psychologist
- ✓ Chronological age between 36 and 72 months
- ✓ Children at Early communicator or Partner stage
- ✓ Hearing sensitivity within normal limits
- ✓ Exposure to English atleast 50% of the time at home
- ✓ Parent (s) of children would have signed up for the Hanen MTW training program
- ✓ Attending the Early Intervention Program for Infants and Children (EIPIC) at Spastic Children's Association of Singapore (SCAS)

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### EXCLUSION CRITERIA



- Children who received or concurrently receiving any other formal intervention approach were excluded from the study.
- Parents who have already attended Hanen – It Takes Two to Talk program prior to the diagnosis of their child were also excluded.

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- So far, the SLP department has conducted 3 Hanen MTW and 1 Hanen ITTT training Programs.
- 19 parents have attended MTW program from 2010 until now.
- The current study has focused only on 7 families based on the inclusion and exclusion criteria.

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## PARTICIPANTS

No. of participants	7
Age Range of children	3.2 years to 5.8 years
Mean age of children	4.5 years
Gender distribution of children	1 female; 6 males
Age range of parents	25 years to 45 years
Mean age of parents	27 years
Gender distribution of parents	2 Fathers; 3 mothers; 2 couples
Ethnic distribution	6 Chinese and 1 Filipino

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## ASSESSMENT TOOLS

- Assessment, Evaluation and Programming System for Infants and Children ® (AEPS®) (Bricker, D. 2002).
- Mean Length of Utterance (MLU) (Brown, 1973)
- Coding (developed by the author based on Girolametto & Weitzman, 2007)

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## ASSESSMENT TOOLS

- Assessment, Evaluation and Programming System for Infant and Children ® (AEPS®) (Bricker, D. 2002).
- ✓ Activity-based, field-tested
- ✓ Criterion-referenced tool used by direct service personnel to assess and evaluate the skills and abilities of infants and young children at risk and who have disabilities
- ✓ Uses a three-point rating system (0 – does not meet criterion, 1 – inconsistently meets criterion, 2 – consistently meets criterion)

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## ASSESSMENT TOOLS – AEPS ®

- Age range – birth to six years
- Consists of six domains:
  1. Gross motor
  2. Fine motor
  3. Adaptive
  4. Cognitive
  5. Social Communication and
  6. Social Skills
- ✓ For the purpose of the study, Cognitive, Social Communication and Social skills were focused.
- ✓ Children were screened on the domains of gross as well as fine motor and adaptive skills

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## ASSESSMENT TOOLS – MEAN LENGTH OF UTTERANCE

- Is a measure of linguistic productivity in children
- Taken as a tool to determine the average length of child's utterances in relation to morphemes rather than words
- Calculated by collecting 50-100 utterances spoken by a child and dividing the number of morphemes by the number of utterances (Brown, 1973).

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**PARENT INTERACTION CODING**

PARENT INTERACTION CODING SCALE

Child's Name: \_\_\_\_\_ Parent's Name: \_\_\_\_\_

Date of coding: \_\_\_\_\_

Strategy	Present (1)	Absent (0)
1. Giving a reason for the child to communicate and the wait: Parents arrange their child's environment so that the child is motivated to attend and interact with them verbally and/or nonverbally by waiting expectantly for initiations		
2. Follow the child's lead: Parents follow their child's lead, when the child initiates verbally or non-verbally, by responding verbally to their initiations, by touching, pointing and commenting on the child's focus (e.g. 'yes that's a dog, oh hihi')		
3. Join in and Play: Parent actively joins in the child's play as a partner by building on their focus of interest and encouraging sub-taking without dominating		
4. Be Face to Face: Parent adjusts her/his physical level by sitting on the floor or in child-sized chair, leaning forward to facilitate face to face interaction, and if above child's level, bending to be close whenever possible		
5. R.G.C.K. in songs, people games, routines: Parent creates structured, predictable, "songs, people games and routines". Parent repeat the child's actions/words and create opportunities for the child to take turns		
6. Say Less, Stress, slow down and show to help the child understand what is said: Parent learns to adjust their language input by shortening their utterances, expanding key words, speaking slowly and supplementing speech with contextual cues (gesture or object or pictures)		
7. Use a Variety of Questions: Parent encourages conversation with her/his child by asking a variety of WH questions, only using Yes/No questions to obtain information and clearly rephrases, waiting expectantly for a response, and avoiding just and rhetorical questions		
8. Add language to the child's utterances and Expand: Parent expands by repeating the child's words and correcting the grammar or by repeating the children's words and adding another idea		

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**PROCEDURE – PARENT TRAINING**

- All the 7 parents attended 40 hours of intensive training (More Than Words)
- 32 hours (8 Saturdays) of actual training + 6 hours of video recording and feedback sessions + 2 hours of pre-consultation and video taping.
- Informed consent were taken from parents for video taping their interaction with the child during people games, reading books, playing with toys, etc.
- The video tapings were done at the centre for 5 children and at the child's home for 2 children.

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**PROCEDURE**

- The following pre and post training measures were calculated:
  - ✓ AEPS
  - ✓ MLU
  - ✓ Coding
- 4 video recordings were originally done during the training sessions.
- For the purpose of this study, only the pre and post video samples were used for comparison.

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**PROCEDURE**

- For each interaction, both the child's and the parent's utterances were manually transcribed, counted and categorized by the SLPs, as described below:
  - ✓ Transcription of child utterances was done from the recorded video sample.
  - ✓ The language output of child and parent were analysed before and after the training using the following measures.

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**PROCEDURE**

- All intelligible, spontaneous child utterances were used to compute the mean length of utterance (MLU).
- The video recording was also used for identifying the strategies used by the parent (s) at two stages, pre training and immediately after the eight weeks training.

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**PROCEDURE**

- The recorded video samples of the parent – child interaction was subjected to frequency calculation of all parental utterances using a coding system.
- Each parental utterance received only one code. The coded data was expressed as score of '1' if the parental response is followed by the child's communicative act and '0' if the child is unengaged in the interaction.
- For the inter-rater reliability check, the parental utterances were coded by two other SLPs Certified in Hanen More Than Words but were not part of conducting the training.
- The coding were done independently by the SLPs to avoid bias.

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## Data Analysis

1. Comparison of the following pre and post parent training
  - a. Child's language output ( MLU)
  - b. Parent's language output (MLU)
  - c. Child's socialization and communication skills (AEPS)
2. Correlation between the parents' responsiveness and children's language output
3. Correlation of intra and inter rater reliability for the parent's responsiveness

**\*\*The obtained data were subjected to statistical analysis using the SPSS software Version 18.**

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## RESULTS

Non-parametric Statistical Data

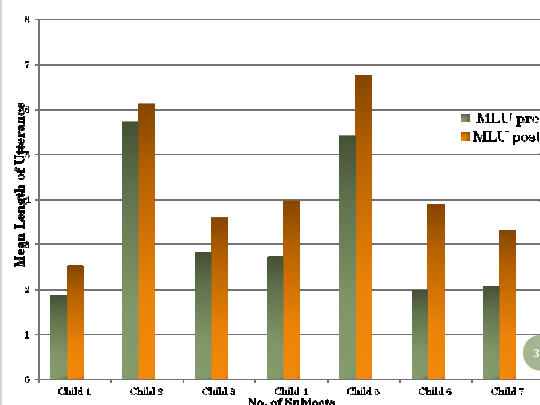
	Mann-Whitney U	Wilcoxon W	Asymp. Sig (2-tailed)	Exact Sig (1 - tailed)
Cog Pre	23.000	51.000	0.848	0.902
Post	13.000	41.000	0.141	0.165
SC Pre	23.500	51.500	0.898	0.902
Post	16.000	44.000	0.277	0.318
SO Pre	19.000	47.000	0.479	0.535
Post	14.500	42.500	0.200	0.209
MLU C Pre	14.500	42.500	0.201	0.209
Post	18.000	46.000	0.406	0.456
MLU P Pre	16.000	44.000	0.277	0.318
Post	20.000	48.000	0.565	0.620

\* $p < 0.05$

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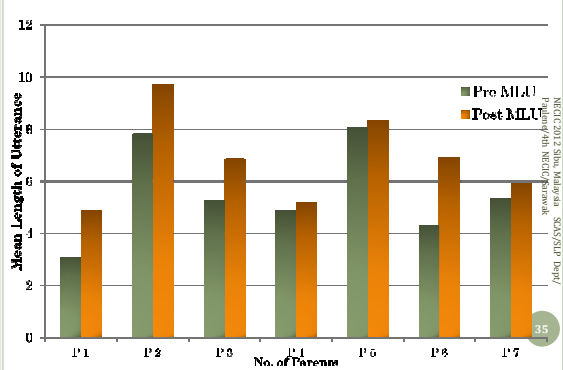
Child's Language Output ( MLU)



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Parent's Language Output (MLU)



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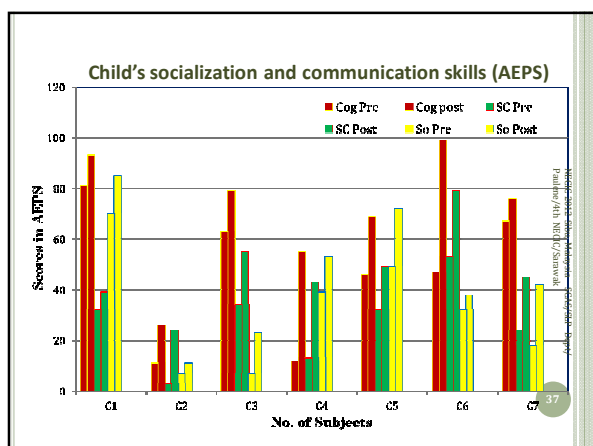
PRE AND POST TRAINING COMPARISON BETWEEN CHILD'S AND PARENT'S MLU

	Mean Rank	p-value
MLU C pre	1.00	0.01*
post	2.00	
MLU P pre	1.00	0.01*
post	2.00	

\* $p < 0.05$

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### Correlation between Parental use of Strategies and Measured Domains

Strategy	Cog	SC	So	MLU C	MLU P
OWL	(0.103)	(0.103)	(0.192)	(1)	(1)
Follow	1 (0.58)	(0.301)	1 (0.258)	9 (0.266)	1 (0.357)
Join in	0.103 (0.245)	0.103 (0.085)	0.192 (0.505)	1 (0.58)	1 (0.286)
Face-face	(0.138)	(0.277)	(0.055)*	1	1
ROCK	(0.010)*	(0.026)*	(0.055)*	1	1
4S's	1 (0.138)	(0.026)*	1 (0.538)	1 (0.301)	0.505 (1)
Que	1 (0.103)	(0.103)	0.214 (0.192)	0.505 (1)	1 (1)
Add	(0.103)	(0.103)	(0.192)	(1)	(1)

\* $p < 0.05$

### CODING - INTER-RATER RELIABILITY

- Cronbach's alpha was used to check the inter-rater reliability for concurrence of responses between the two SLPs (certified in MTW).
- Reliability Statistical Scores ranged between 0.8 and 0.9 indicating acceptable to excellent correlation.

## DISCUSSION

### MEAN LENGTH OF UTTERANCE

- Increase in the mean **MLU of the Parents** is consequent to the use of strategies (adding language, questions) appropriate to the child's stage of communication (EC / Partner stage)
- Increase in the mean **MLU of the children** could be attributed to the parent's responsiveness and use of language eg. use of open-ended questions, encouraging narrative forms of sentences, etc rather than labeling.

### MEAN LENGTH OF UTTERANCE CONTD.

- It was also observed that the parents **reflected a change in conversational style** in response to the child's growing competence after the training.
- The receptive ability of the children in the study were not measured, however improvement in the expressive vocabulary could be attributed to the **improvement in the receptive skills of the children**.
- Statistical significance was evident ( $p < 0.05$ )** between the parents and children's MLU scores indicating a positive correlation.
- Parents were able to **identify the current as well as the next step to facilitate communication** and socialization skills in the children post training resulting in goal-oriented language use.

### CHILD'S SOCIALIZATION AND INTERACTION SKILLS (AEPS)

- The raw scores indicated a significant difference between the pre and post training scores of AEPS though no evidence to show statistical significance across all the domains analyzed.
- This shows that **the parent's use of responsive strategies** such as Face to face, adding language, ROCK etc. has **positively influenced the child's social, interaction and cognitive skills**.
- **All the parents were observed and reported to have increased their level of responsiveness after the training.** (Mahoney & Perales, 2003).

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### CODING – PARENTAL RESPONSIVENESS

- The *acceptable to excellent* correlation scores in Cronbach's Alpha reliability measure indicated a positive association between the parent's use of strategies and the child's responses.
- This score also reveals a high correspondence between the judgments of the two SLPs who were involved in the data coding.
- This reflects that the parent's use of responsive strategies were consistent and evident throughout the video sample.

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### SUMMARY AND CONCLUSION

- Parents were able to apply and use the interaction strategies to facilitate the communication, interaction and social skills in their children.
- Both the parents and the children had increased Mean Length of Utterance after the training.
- The parents were able to incorporate communication and socialization goals in their daily routines in a naturalistic context.

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### SUMMARY AND CONCLUSION CONTD.

- No one approach that can be universally applied for children with ASD
- Parents should be included as partners in the intervention process
- Intervention should be focused and goal-oriented according to the child's stage of communication and socialization development.

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### Videos

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### FUTURE DIRECTIONS

- To study the effectiveness in a larger sample size
- To extend the study and data collection at various points to find out the long-term outcomes
- To compare with a control group (parents who have not attended MTW training)
- To consider similar study in non-verbal children with ASD
- To study whether the MLU, social skills and communication would vary with the Educational Qualification, Occupation, Cultural Background, and Language Proficiency of the parents.

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