THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA

Reported by – VICKI BITSIKA – 2010 Churchill Fellow

To investigate specialised intervention technologies for children and adolescents with Autism Spectrum Disorder

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2010 WINSTON CHURCHILL FELLOWSHIP REPORT ON ASD INTERVENTION STUDIES
## INDEX

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>3</td>
</tr>
<tr>
<td>Executive summary</td>
<td>5</td>
</tr>
<tr>
<td>Programme outline</td>
<td>6</td>
</tr>
<tr>
<td>University of North Texas</td>
<td>8</td>
</tr>
<tr>
<td>TEACCH</td>
<td>15</td>
</tr>
<tr>
<td>MIND Institute</td>
<td>21</td>
</tr>
<tr>
<td>California State University (Fresno)</td>
<td>26</td>
</tr>
<tr>
<td>Cambridge University</td>
<td>31</td>
</tr>
<tr>
<td>London (National Autistic Association)</td>
<td>33</td>
</tr>
<tr>
<td>Conclusions</td>
<td>36</td>
</tr>
<tr>
<td>Recommendations</td>
<td>39</td>
</tr>
</tbody>
</table>
INTRODUCTION

The primary purpose of my studies in the USA and England was to investigate autism-specific interventions used to build functional skills and minimise behaviours which can prevent learning and social inclusion. The interventions I studied all met three important clinical criteria. They were established (i.e., clear procedures for application were present), person-focused (i.e., interventions were reported to address individual needs), and outcome focused (i.e., interventions were designed to improve mental wellbeing and quality of life). There are numerous autism-specific interventions available to families and professionals alike. Some of these are supported by long-term systematic empirical examination (evidence-based interventions), some have begun the process of evaluation and are showing promising results (emerging-evidence interventions), and a proportion of treatments make claims regarding efficacy that are unsubstantiated (no evidence). In selecting interventions for investigation, I focused on four evidence-based interventions and one emerging-evidence treatment model. Evidence-based interventions were Applied Behaviour Analysis, TEACCH, Functional Analysis, and SPELL. The emerging-evidence intervention was the Early Start Denver Model.

A secondary purpose of my studies was to learn about screening tools used to detect risk of onset of autistic disorder in toddlers. The research literature and my clinical experience have shown that individualised, intensive intervention is most effective when it is applied very early in the child's life. If we are able to identify the beginnings of autism impairment in children as young as 18 months old, we can provide them and their parents with targeted assistance. Because my interest was in clinical application and dissemination of information to other clinicians in the field, I wanted to gain in-depth knowledge about one screening tool with a solid track record in early detection rather than become superficially informed about a number of such tools. I chose the Q-CHAT for this investigation.

ACKNOWLEDGEMENTS

I would like to give my sincere thanks to the Winston Churchill Fellowship Trust for providing me with the opportunity to participate in an intense and immensely rewarding learning programme which I hope will be of great benefit to children and adolescents with an ASD, their families and those professionals who assist them.

I would like to thank Professor Raoul Mortley, Dean of the Faculty of Humanities and Social Sciences for excusing me from Bond University duties so that I might focus completely on my Fellowship studies.

I give thanks to the children and families I work with on the Gold Coast for giving me the time off to 'go back to school'.

Finally, I thank my husband Chris Sharpley who travelled with me and made the numerous transitions effortless. Thank you Chris for your unending support in all that I do.
EXECUTIVE SUMMARY

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These Winston Churchill Fellowship studies not only provided me with the opportunity to
develop an international perspective on autism treatment approaches and new research
initiatives, but also the chance to form collaborations with leaders in the field. I have returned
to Australia with a strong motivation to extend the knowledge I have gained and create
avenues for it to be shared with important target groups in the community. All the clinicians
and researchers I met were generous with their time, knowledge and resources, and this
ensured a quality learning experience. I would like to acknowledge and offer sincere thanks
to Associate Professor Shahla Ala’i-Rosales (University of North Texas at Denton),
Professor Grace Baranek (University of North Carolina at Chapel Hill), Ms. Criss Wilhite
(California State University at Fresno), Dr Carrie Allison (Cambridge University), and
Mr Richard Mills (The National Autism Society in London). These people were particularly
helpful in providing recommendations for further clinical and research investigations, and
contacts with them represent the highlights of my studies.

The major lessons arising from these studies relate to strategies for ensuring effective
intervention and delivery of services, and evaluation of those interventions.

First, screening for early detection of possible ASD is crucial. Implementation of such a
screening programme in the Australian context would lead to improved quality of life for
individuals with ASD and their families, and (on the part of government bodies) improved
economic outcomes from service delivery resources.

Second, training of education and mental health professionals should be re-directed from
descriptions of ASD and generic treatments for this condition towards development of
training programmes which teach ‘whole approaches’ and methods for applying these in an
individualised manner to meet the needs of clients with an ASD.

Third, practitioners (e.g., teachers) who are responsible for hands-on work require
assistance in viewing themselves as scientist-practitioners and engaging in the data-
collection, self-reflection and evaluation processes which are crucial to ethical delivery of
efficacious treatments.

Fourth, children and adolescents with an ASD are highly vulnerable to environmental
conditions and these often lead to disengagement from learning. Schools which accept the
responsibility of educating children with an ASD would assist them greatly by applying
structured and low-arousal principles.

Finally, children and adolescents with an ASD have dreams and aspirations which should be
acknowledged and included in any intervention developed to assist them.
I plan to implement the lessons learned in my role as a practitioner working hands-on with individuals with an ASD and their families, and also as a consultant in the field with the professionals I support. Dissemination of the information gained during this Fellowship will occur via development of training programmes which will target both professionals and families of individuals with an ASD, consultative meetings with education departments and autism support organizations, teaching and supervision of Bond University students planning to gain employment in the ASD field, mentoring of junior academics at Bond University who request assistance in gaining knowledge on specialised autism-specific interventions, and development of research initiatives to be undertaken in the Centre for Autism Spectrum Disorders at Bond University.
PROGRAMME

Texas, USA (4th – 8th October, 2010):
Studies were undertaken in the Department of Behaviour Analysis, University of North Texas at Denton. The study topic was *ASD Early Intervention and Emerging Applied Behaviour Analysis Intervention Models*. I met the following people in this section of the programme –

- Shahla Ala’i-Rosales (Associate Professor, ABA Department, University of North Texas, Denton);
- Richard Smith (Associate Professor and Chair, ABA Department, University of North Texas, Denton);
- Sigrid Glenn (Regents Professor, ABA Department, University of North Texas, Denton);
- Jesus Rosales (Professor, ABA Department, University of North Texas, Denton);
- Suzanne Bonifert (Callier Centre for Communication Disorders);
- Nicole Zeug (Sunny Starts Programme for Parents and Toddlers with an ASD).

North Carolina, USA (12th – 15th October, 2010):
Studies were undertaken at various TEACCH sites as this programme is connected with the University of North Carolina in Chapel Hill. The study topic was *TEACCH Applications for Individuals with an ASD across Functional Level and Age*. I met the following people in this section of the programme –

- Brian Boyd (Investigator, Frank Porter Graham Child Development Institute, TEACCH);
- Tom Wiebe (Psychoeducational Therapist, Carolina Living and Learning Centre);
- Sam Odum (Director of Frank Porter Graham Child Development Institute, TEACCH);
- Lauren Turner (Clinical Psychologist, Carolina Institute for Developmental Disabilities, University of North Carolina, Chapel Hill);
- Grace Baranek (Professor, University of North Carolina, Chapel Hill);
- Elizabeth Byars (Psychoeducational Therapist, Adolescent Programme, TEACCH).

Sacramento, USA (1st – 3rd November, 2010):
Studies were undertaken at the MIND Institute which is linked to the University of California in Davis. The study topic was *New Initiatives in Development of Educational Programmes for Young Children with an ASD*. I met the following people in this section of the programme –

- Sally Orzonoff (Professor, Department of Psychiatry and Behavioural Science, School of Medicine, University of California, Davis);
- Sally Rogers (Professor, Department of Psychiatry and Behavioural Science, School of Medicine, University of California, Davis);
- Therapists involved in delivery of the *Early Starts Denver Model* intervention.
Fresno, USA (3rd – 10th November, 2010):
Studies were undertaken at the Central California Autism Centre and Department of Psychology, California State University in Fresno. The study topic was Emerging Functional Analysis and Applied Behaviour Analysis Models for Intervention Design. I met the following people in this section of the programme –

- Criss Wilthite (Department of Psychology, California State University, Fresno)
- Dr. Amanda Adams (Director Central California Autism Centre, Department of Psychology, California State University, Fresno);
- Dr Marianne Adams (Department of Psychology, California State University, Fresno);
- Greg Hanley (Associate Professor and Director of ABA PhD Programme, Western New England College, New England);
- Administrators of the Central California Autism Centre;
- Therapist and supervisors involved in delivery of the CCAC Intensive Intervention programme.

Studies were undertaken at the Autism Research Centre, University of Cambridge. The study topic was Screening Tools for Toddlers at Risk of ASD. I met the following people in this section of the programme –

- Dr Carrie Allison (Investigator, Early Screening and Identification of Autism programme, Autism Research Centre, University of Cambridge);
- Research personnel involved in various aspects of early screening research, development of ASD subgroup phenotypes, and differentiation of at risk from typically developing toddler profiles.

Studies were undertaken at The National Autistic Society in London and the Sybil Elgar School in Middlesex. The study topic was SPELL as a Foundation for Intervention across Functional Levels and Ages. I was also fortunate to meet a number of key researchers who have made a substantial contribution to the understanding and treatment of ASD. In addition to listing the people I met regarding SPELL, I have also made reference to these researchers below in italics –

- Dr Julie Beadle-Brown (Senior Lecturer in Learning Disability, Tizard Centre, University of Kent);
- Richard Mills (Director of Services and Research, The National Autistic Society);
- Lucy Burbolt (Lead Teacher, Sybil Elgar School, Middlesex);
- Carol Povey (Regional Coordinator Adult Services, The National Autistic Society);
- Patricia Howlin (Professor, Institute of Psychiatry, Kings College, London);
- Dr Judith Gould (Director of the NAS Lorna Wing Centre for Autism);
- Christine Ecker (Investigator, Institute of Psychiatry, Kings College, London);
- Digby Tantum (Professor, Autism Research Centre and University of Sheffield);
- Tony Charman (Professor, Department of Psychology and Human Development, University of London).

2010 WINSTON CHURCHILL FELOWSHIP REPORT ON ASD INTERVENTION STUDIES
UNIVERSITY OF NORTH TEXAS

Background:
The Department of Behaviour Analysis at the University of North Texas in Denton has a world renowned reputation for its degree programmes in Applied Behaviour Analysis (ABA) and application of behavioural intervention models specifically designed to meet the needs of young children with an ASD. This Department is credited with leading the field in designing child-focused early intervention programmes which succeed in meeting rigorous evaluations by external assessors and in creating substantial improvements in child skill levels. The Master of Science in Behaviour Analysis degree has received the highest commendation from the Behaviour Analysis Certification Board and the academics who teach on this degree have established reputations as teachers, researchers and clinicians in ASD assessment and treatment. During my visit to the Department of Behaviour Analysis I formed solid relationships with Shahla Ala'i-Rosales (Associate Professor), Richard Smith (Associate Professor and Department Chair), and Jesus Rosales (Professor), and was fortunate enough to be included in the discussion and implementation of both clinical and research activities at the University.

Despite its presence in the fields of special education and disability treatment since the 1950's, Applied Behaviour Analysis became prominent as an intervention for children with an ASD in the early 1990's due to the occurrence of two events. The first event was publication of an article by Lovaas and Koegel (1987) in which it was reported that 47 percent of children with an ASD who received access to 40 hours per week of ABA therapy made significant developmental gains. These children were able to be enrolled in mainstream grade one classes and were reported to have achieved age-appropriate cognitive ability and academic performance at the conclusion of their first year in school. These gains were not evident in children who received only 10 hours of ABA therapy per week, thus prompting the recommendation by these researchers that 'intense therapy' was necessary.

The second event was the 1993 publication of a book written by Catherine Maurice (titled Let Me Hear Your Voice: A Family's Triumph over Autism) who was the mother of two children who received a diagnosis of autism. She became aware of the research of Lovaas and set up a home-based intensive ABA programme which was reported to produce reasonably fast (in the case of her daughter) and significant developmental improvements across all areas of skill, thus allowing both children to be enrolled in mainstream school. Catherine Maurice made mention of her children undergoing 'recovery from autism' due to receiving ABA therapy and this claim, together with those made by Lovaas and his research team, placed intensive ABA in the forefront of best practice interventions for children with an autism disorder. Since these antecedent events, much research has been dedicated to evaluating the efficacy of intensive ABA and determining the elements of ABA which are necessary for treatment success. There has also been a proliferation of degree programmes dedicated to teaching ABA and therapists who work as consultants to families seeking to establish intensive home-based interventions for their children with an ASD.

ABA has made many important contributions to the understanding and designing of interventions for children with an ASD, including: detailed assessment targeting specific skills rather than broad abilities across all key areas of development (e.g., social, language, motor); task analysis of skills to be learnt so as to ensure the child is presented with
achievable demands; data-collection systems for recording skill improvements in precise terms; and consistent usage of sound behavioural techniques to prompt, shape and reinforce accurate performance on behalf of the child. Despite these advantages of ABA and its confirmation as an efficacious early intervention approach for ASD, there are a number of potential limitations to its application in the home and other learning environments. My impression is that these limitations have arisen from an over-focus on particular aspects of Lovaas' research and that of subsequent researchers, plus an under-focus on assist the child with an ASD to actively engage in the social environment.

ABA interventions implemented exclusively or primarily via Discrete Trial Training (DTT) have received criticism from researchers and clinicians in the field for a number of years. In brief, DTT occurs when the child is exposed to a stimulus (e.g., a therapist request such as “Touch your nose”) plus a demonstration of the correct response to the stimulus (i.e., therapist touches her nose). If the child touches his nose, he receives a reward. If the child makes an error, he is either ignored or corrected neutrally. As the child learns to produce the correct response with more regularity, the therapist phases out demonstrating the correct response and any other prompts used to assist the child. DTT is most often undertaken on a one-to-one basis at a worktable. The criticisms of DTT relate to its focus on drilling and imitation to develop skills, creating learning situations which do not approximate those that occur in the natural environment, and selecting skills which are pre-academic rather than functional, and using edible items to reinforce correct responses. Further, ABA interventions (whether they involve DTT or not) conducted in the home environment often result in the child with an ASD learning skills rigidly and being unable to use these in other situations in which the skills are necessary. Finally, in cases where a young child might become distressed and attempt to leave the learning situation, therapists work to keep the child seated to avoid reinforcing escape behaviour. This type of adult response can exacerbate the child's distress and perception of the learning situation as being aversive and fearful.

Reason for Studying the Department of Behaviour Analysis:
It is my judgement that ABA interventions, when applied in a functional and child- and family-centred manner, have the potential to improve the lives of children with an ASD both in the short- and long-term. I am particularly interested in learning about evidence-based methods for giving children with an ASD the best preparation for a quality education and meaningful social inclusion. In my clinical work, I have witnessed the multiple benefits that result when families and education personnel view themselves as a collaborative team which agrees on the objectives and methods for assisting the child. On many occasions, I have become involved in mediating between families and education personnel who disagree intensely on the ways in which the child is managed by either party, and it appears that the individual who is most disadvantaged by his conflict is the child. In my career, this type of inter-environment conflict regularly occurs when a home-based programme occurs in isolation from the learning that occurs in the educational setting. This prompted me to investigate the community-based ABA programme run by the Department of Behaviour Analysis which offers children centre-based intervention which is carried into the home environment by parents who are trained in behavioural methods. Finally, this community-based programme was reported to have overcome the limitations of ABA interventions discussed in the earlier section of this report and I was very interested to observe the ways in which it was organised, implemented and evaluated.
Observations, Activities and Discussions – CLINICAL:
I was given the opportunity to visit three centres with established ABA interventions for very young (1 – 4 years of age) children with a diagnosed or suspected autism-based disorder. In each instance I was accompanied by Associate Professor Rosales who provided me with background on centre structure, organisation, and personnel. I was provided with the opportunity to engage in discussions with centre administrators, programme coordinators, and intervention therapists. In addition to this, I observed large segments of interventions applied to a number of children in each centre. In the case of Sunny Starts Centre, I was permitted to speak to parents regarding their children’s progress and their experiences in participating in sessions as co-therapists, and to engage participate in implementation of interventions with children.

The University of Texas Southwestern Children’s Medical Centre Autism Programme (located in Dallas) was initially developed as a diagnostic service for children with a suspected autism disorder. Assessments are undertaken by a multidisciplinary team including medical experts, psychologists, and speech pathologists. The ABA intervention programme is a recent addition (approximately 12 months) to services offered to children, and aims to offer short-term access to behaviourally-oriented, intensive early intervention to recently diagnosed children.

Diagnostic assessment is considered to be the primary service offered to the public and, at the time of my visit, early intervention comprised a smaller initiative but there were plans to expand on this service due to substantial community demand. The assessment of children was reported to be completed in a single day (taking about 6 hours), with a multi-disciplinary team collecting developmental and other data. The assessment battery included a wide range of tests and interview methods, allowing for a thorough investigation of all key aspects of child functioning to aid in arriving at a firm diagnosis. The cycle of activities leading to an official diagnosis of autistic disorder which occurs in that one day was described as follows:

(i) Parent(s) is interviewed for a developmental and family history and outline of key concerns regarding the child’s previous and current functioning;

(ii) The child participates in a series of testing and observation sessions in which standardised tests of intelligence, social functioning, adaptive behaviour are administered;

(iii) Clinicians involved in the standardised testing score and interpret all tests;

(iv) The entire team of clinicians involved in the assessment meets with the parents to provide feedback on diagnostic conclusions;

(v) The social worker responsible for parent support meets the parents to discuss services in the community.

The parent(s) receives a copy of the formal diagnostic report and a follow-up telephone call from the social worker subsequent to the assessment day. The assessment process described above has the advantage of providing parents with an immediate decision regarding their child’s diagnostic profile and minimises the distress that can occur from
parents having to wait for prolonged time periods for this information. However, this intensive assessment model could result in substantial anxiety and fatigue for the young children being tested, and for their parents who would observe any instances of behavioural deterioration.

The short-term ABA early intervention was introduced as a service for the children who had undergone assessment (and received a diagnosis of autistic disorder) at the Medical Centre. Programmes were run on a one-to-one basis with no other children present (i.e., 2 sessions per week over a 60-week period). The Coordinator of the programme stated that the introduction of this intervention service was in response to the paucity of ABA early interventions in the Dallas area and the large waiting lists to gain access to these interventions. The Coordinator, a Board Certified Behaviour Analyst, was responsible for all pre-intervention skill assessments, intervention goals and objectives, and learning activities. She was also responsible for reviewing data records to track the child’s progress and make decisions regarding further skill development. The Coordinator had trained two nursing students in Discrete Trial Training and application of behavioural principles (e.g., prompting, shaping, reinforcement) to skill building in children with an ASD. These two students were responsible for working with children on a one-to-one basis and collecting data on their responses. In discussing the ways in which these students implemented interventions, it became clear that they understood the importance of incorporating fun and play as well as trial-based teaching in all sessions with children. I was able to observe a session being implemented and was pleased to see that both nursing students had a genuine liking for the children they were working with. The Coordinator reported that the intervention process also involved training parents in behavioural principles to facilitate transfer of skill training into the home environment. In the case of parents, the focus was on helping them to use basic practices, such as positive reinforcement, to increase the child’s usage of particular skills which were being worked on in the centre. My observations of this short-term ABA early intervention suggest that it adheres strongly to the procedures of Discrete Trial Training.

The Callier Centre for Communication Disorders (School of Behavioural and Brain Sciences, University of Texas) has provided specialised individual and group therapy services to children and adults with an ASD for over 30 years. I observed a number of group interventions in the Early CLASS (Communication, Language And Social Skills) Preschool which is a classroom-based speech, language and communication program for children aged up to 5 years who have an ASD. Suzanne Bonifert (Head of Speech-Language Pathology) reported that the curriculum was developed using the SCERTS model and interventions addressed the core autism-based impairments. The focus was reported to be on assisting children to become competent communicators while preventing onset of the behaviours which interfere with learning and social relationships. Behavioural therapy was reported to be embedded in a developmental framework, with skills being taught in a cumulative manner. Ms Bonifert reported that interventions also incorporated other autism-specific educational approaches and delivery of services, and allowed for flexibility in selection of the most appropriate interventions to meet the specific developmental needs of children. Observations and discussions with preschool therapists indicated that this programme was designed to provide specialised early intervention within a naturalistic environment, which meant that all physical arrangements, daily routines, and tasks, closely approximated those that the child would encounter upon entering the mainstream school.
system. Ms Bonifert reported that this more natural and flexible approach to intervention restricted the programme to higher functioning children with an ASD with fewer needs for clear structure and routine. In discussing the application of ABA methodology in the preschool, Ms Bonifert reported that Discrete Trail Training was not used because of the criticisms outlined in a previous section of this report. She also commented that an intervention priority was for therapists to establish strong relationships with children and to facilitate positive interactions between peers. Therefore, the emphasis was on presenting each child with meaningful educational and play activities and planning for skill building to occur as a result of these. Ms Bonifert reported that it was the therapist's job to provide achievable learning opportunities and to shape these based on the child's responses. Because this intervention approach involved careful observation of the child, recorded information was more descriptive rather than quantitative (although the latter type of data-collection also occurred). My observations of the Early CLASS Preschool suggested that it is a child-centred, group-based early intervention designed to teach specific communication and social skills in a naturalistic manner to ensure effective transition of children into a mainstream classroom. There was evidence of ABA principles being applied in a flexible manner often to encourage usage of functional rather than pre-academic skills.

The Sunny Starts Programme for Parents and Toddlers with an ASD has a collaborative connection with the Department of Behaviour Analysis at the University of North Texas and the Easter Seals North Texas Autism Treatment Programme. During my visit to this programme, I met with Nicole Zeug (BCBA and Lead Behaviour Analyst), trained therapists, and university students on placement. Associate Professor Ala'i-Rosales was responsible for the initial development of Sunny Starts and maintained a consultative role in the programme, and she and I had numerous productive discussions regarding Sunny Starts, various models for delivering ABA interventions during the early years of a child's life, and the future directions for ABA intervention. The mission of Sunny Starts is to develop and implement evidence-based services to enhance quality of life for families who have toddlers or infants with an ASD. Eligibility criteria include: a restricted child age of 6 to 36 months, either a diagnosis of autism-based disorder or identified risk disorder onset, and capacity to attend sessions at the centre. The intervention is focused on creating positive child-focused outcomes via parent (often mother) training and is delivered in 12, one-hour sessions scheduled to occur on a weekly basis. The Early Starts intervention provides parents with the techniques to prompt and shape their child's development of communication, social and play skills. Prior to attending the programme, a videotaped Ecological Assessment of 1.5 hours is undertaken to gather a standardised measure of parent-child interactions in the natural (home) environment. This is followed by a Clinical Assessment comprising a minimum of three 10-minute videotaped mother-child interaction segments. This second assessment is done in the Centre and aims to establish a baseline for child and parent interaction responses before intervention is implemented. Data from these assessments and parent interviews are used to write a FCP Individual Family Service Plan which specifies family strengths, goals for the child and his/her mother, and data-collection methods to measure child and mother successes (note: unsuccessful responses are not recorded).
Associate Professor Ala'i-Rosales has named the intervention taught to parents the DANCE (Decide, Arrange, Now, Count, Enjoy):

- **Decide** on a good teaching moment, target skill, and teaching environment;
- **Arrange** the environment to prompt communication and play;
- **Now** refers to immediate delivery of reinforcers for all approximations to the target skill;
- **Count** by taking brief samples, the number of times the child uses a target skill;
- **Enjoy** by ensuring that both parties are having fun.

Training sessions involve the child, mother, therapist 1 (trainer), and therapist 2 (data-recorder) and are conducted in a play room which is well-structured in relation to placement of toys and designated play/rest areas. I observed a one-to-one session involving a 3 year old and his (foster) mother who were in the early stages of therapy. Therapist 1 played with the child and modelled communication and social strategies for the mother and therapist 2 sat away from the focus of play, observing and recording child responses. The play room was connected to an observation room and Associate Professor Ala'i-Rosales commented that this allowed for senior personnel and herself to observe and monitor child/mother progress in order to feedback to therapists any changes needed to training. In discussing the ways in which this mother-child training matched the ABA early intervention approach with Ms Zeug, it became clear that Discrete Trial Training was not used. Associate Professor Ala'i-Rosales reported that the intention was to present children with those toys and games known to be preferred and reinforcing so that communication and social skills could be encouraged in a non-threatening manner.

My observation of sessions indicated systematic usage of behavioural principles such as shaping, positive reinforcement, task analysis and modelling. It was clear that therapist 1 was implementing the sessions in accordance with an individual session plan and therapist 2 was collecting qualitative and qualitative data on child performance. My participation in post-session review meetings with Ms Zeug and therapists indicated that data-records(7,12),(988,986) were analysed carefully to make informed decisions regarding specific directions for future sessions. In addition to these traditional ABA techniques, I observed the therapists to be excellent observers of behaviour and skilled in responding to children's initiations to ensure meaningful play, to modify their demands if children became overloaded, and to gently assist mothers to remain focused on their children's successes. The children I interacted with appeared to be comfortable and happy and there was no evidence of challenging behaviour. However, Ms Zeug and therapists pointed out that children almost always exhibited some form of challenging behaviour in the early stages of intervention. Their belief was that this behaviour was associated with the child feeling confused, anxious and frustrated and once (s)he was assisted to understand the processes involved in intervention and experienced success in sessions, these behaviours would dissipate.
Observations, Activities and Discussions – RESEARCH:
Discussion with Associate Professor Ala'i-Rosales revealed that research into ASD was focused on young and school-aged children with studies involving micro-analysis of the instructional situations to determine those variables associated with positive learning outcomes. This research involved $n = 1$ investigations based on extensive collection and analysis of behavioural data to determine functional relationships. Professor Ala'i-Rosales also reported an increasing interest in conducting research into the mental health outcomes of parenting a child with an ASD with the overall aim of developing behavioural techniques to assist parents in overcoming an adverse mental health experiences.
TEACCH PROGRAMME

Background:
The TEACCH (Treatment and Education of Autistic and Communication Related Handicapped Children) approach arose from the research of Dr Eric Schopler and represents one of the earliest evidence-based frameworks designed to address the needs of individuals with an ASD. Schopler and his research team initially focused their investigations on development and evaluation of diagnostic (i.e., Childhood Autism Rating Scale [CARS]) and assessment (i.e., Psychoeducational Profile [PEP]) instruments to ensure accurate identification of autism-based disorder and thorough profiling of skill strengths and weaknesses.

Later research investigations aimed to determine the most effective processes and methods for treatment delivery and evaluation. Schopler, via continual empirical investigation and systematic delivery of clinical/educational services, was significant in establishing autism as a disorder with neuro-biological causes and advocating against the predominant belief that poor parenting caused autism. He also introduced a conceptual framework referred to as the 'Culture of Autism', which was developed to assist professionals and caregivers in understanding the characteristic ways in which individuals with an ASD view, think about, and react to the social world. Schopler's person-centred approach was central in emphasizing the importance of parental input in delivery of treatment programmes (especially those targeting the needs of young children with an ASD) and actively incorporated parents as co-therapists. The current TEACCH approach has been shaped by Dr Garry Mesibov, who joined the University of North Carolina at Chapel Hill in the mid-80s and played a significant role in driving research and treatment initiatives, especially in relation to adolescents and adults with an ASD.

TEACCH provides services to individuals with an ASD of all ages and levels of functioning. The goals of the TEACCH approach continue to be humanistic in focus and, in addition to systematically building the skills needed for age-appropriate functioning, all intervention methods are designed to respect and enhance the individual's needs for dignity, engagement in productive and meaningful activities, and feelings of self-worth and self-confidence. The person-centred goals are addressed via individualised interventions based on Structured Teaching which entails modifications to physical aspects of the learning environment as well as visual supports designed to emphasize and clarify the 1) sequence of daily activities to be completed in one day or one work period, and 2) steps to be taken in completing individual tasks (Van Bourgondien, Reichle & Schopler, 2003). The research into the efficacy of Structured Teaching initially involved design of self-contained TEACCH classrooms which allowed for maximum incorporation of structure, but subsequent and current research initiatives have investigated the effectiveness of structure in mainstream classroom contexts. Central to the delivery of TEACCH interventions in the clinical and educational environments is regular data-collection to monitor the progress made by children/adolescents in acquiring and applying new skills as well as forming an objective basis for selection of future treatment goals.
Reason for Studying TEACCH:
As a Clinical Psychologist involved in treatment of ASD, I have depended heavily on educators and caregivers to participate in and, often take responsibility for, delivery of autism-based interventions in natural contexts such as schools and homes. My own experiences in training educators/caregivers to enhance positive responses from children with an ASD suggest that their effectiveness can be hindered by a lack of knowledge regarding the principles underpinning the practical strategies they are applying on a day-to-day basis. This has led me to conclude that it would be advantageous to adopt an holistic approach to professional/caregiver training which elaborates on intervention frameworks in relation to the philosophical concepts and global principles on which they are based. In simple terms, trainees in ASD treatment should be clear about why they are applying particular strategies and the significance of these to the child's or adolescent's immediate progress and long-term quality of life. I was interested in investigating TEACCH because it represents a humanistic, person-centred approach with a strong research track record and clear frameworks to guide systematic data-collection and application of strategies. My aim was to observe the TEACCH approach in action and discuss the most recent research initiatives being undertaken in delivery of clinical and educational interventions.

Observations, Activities and Discussions – CLINICAL:
I visited the Carolina Living and Learning Centre (CLLC), an integrated vocational and residential programme for adult clients with an ASD. I had the opportunity to discuss specific issues regarding service delivery according to TEACCH principles with a range of Therapists and observe adult clients participating in vocational activities. This service has been developed for lower-functioning clients with an ASD and Intellectual Impairment who have been assessed to have high needs requiring 24-hour supervision. Currently, 15 adult clients (13 males and 2 female) reside in the CLLC and all of them have had previous and long-term exposure to the TEACCH approach. In addition to intensive vocational guidance, these clients require and receive access to intensive training in communication and socialisation skills; it is anticipated that the requirement for this form of training will be lifelong. The curriculum extends across all areas of life and functioning (e.g., self care, vocational training and behaviour management) and the staff to client ratio is 1:2. In addition to offering continuous support from TEACCH-trained Therapists, the facility also accesses various consultants such as pharmacologists, psychologists, speech therapists, occupational therapists and physical therapists. Input from consultants depends on particular client needs and is determined by client training goals and any performance variations indicating that specialised assistance from a consultant is necessary.

The facility includes a farm plus craft-oriented vocational sites. Clients work on the farm (e.g., growing vegetables/herbs, composting), make soap, potpourri and cards, and participate in cooking activities. Each client is on an individual training programme which is flexible enough to incorporate personal preferences (e.g., early versus late start to the workday, working inside versus outside) and phases that impact behaviour (e.g., stress cycle). Each individual training programme is written according to the TEACCH principles for humane delivery of services plus the environmental structuring and organisational methods to ensure clients remain calm and open to instruction. Discussions with Therapists indicated strict adherence to the 'Culture of Autism' model which details the autism-specific thinking and behaving characteristics shown to have a positive impact on client functioning.
This model suggests the individual with an ASD will have –

- Difficulty in extracting meaning from the social environment and his/her learning experiences. This is the result of excessive focus on details with minimal capacity to sequence or prioritise these to create meaning;
- Difficulty in combining ideas to form a broader concept or understanding;
- Difficulty in organising ideas, stimuli, and materials to aide effective completion of tasks and activities;
- Difficulty with attention which might manifest as distractibility (i.e., unable to engage in sustained focus), inflexibility in focus (i.e., unable to re-direct attention to new or different idea/event), or some combination of these;
- Difficulty in communication which is impacted by cognitive ability. Most individuals are considered to experience impairment in pragmatics which prevent them from understanding the social content of language and in delivering socially-relevant communication messages;
- Difficulty in determining the passage of time and responding to time cues;
- Atypical sensory responses leading to rigid preferences and non-preferences for olfactory, tactile, auditory, and visual stimuli and events;
- Relative strength in discriminating and processing visual information in comparison to auditory processing which is under-developed;
- Tendency to develop strict adherence to routines which can cause distress (due to confusion and loss of meaning) when routines are changed;
- Strong impulse to maintain ‘sameness’ which is thought to predispose the individual to developing repetitive behaviours and ritualised activities and becoming distressed when required to disengage from these.

In observing client-therapist interactions, I noted a high adherence to the guiding principles of maintaining the dignity and self-worth of individuals with an ASD. A review of the vocational tasks that clients were exposed to at CLLC indicated that they all adhered to four criteria. Tasks incorporated 1) ‘high meaning’ with emphasis on entire functional processes (e.g., clients are trained to plant/grow vegetables as well as pick, cook and eat them [in a favourite meal]); 2) consistent choices for most activities; 3) personal preferences and interests; and 4) individualised visual supports. Each client had access to multiple visual supports which assisted him/her to comprehend and draw meaning from all tasks and day-to-day activities.

The adherence to TEACCH values, the Culture of Autism Model, and Structured Teaching principles described above were also in clear evidence during my visit to the Frank Porter Graham Child Development Institute and the Chapel Hill TEACCH Centre. Discussions pertaining to the application of the TEACCH approach in one-to-one therapy with adolescents indicated that sessions were embedded in structure and skill-building. Therapy
sessions, which can occur between one and three times per week, are carefully planned not only in relation to session goals and discussion topics, but also physical arrangement of the therapy environment, exposure of relevant versus distracting materials/objects and development of visual supports. These visual supports become the focus for reviewing key problematic issues and building skills to cope with these in the natural environment. Active therapist-driven rehearsal is a key feature of therapy sessions, parts of which are videotaped and used to deliver feedback in practical terms. Adolescents leave sessions with the visual supports used in therapy as one basis for generalising therapy learning to the environments in which they experience difficulties.

This is a well-resourced service which presents clients with a calm and highly structured physical environment. There are numerous withdrawal places such as a lake, forest area, and bedrooms (each client has his/her own room). Group areas are minimalistic with geometric placement of furniture and visual markers to delineate particular areas/activities. It is my impression that we do not have sufficient commitment to the TEACCH approach and access to the high level of resourcing needed to replicate this model in the Australian context.

**Observations, Activities and Discussions – Research:**
I participated in discussions with a number of academics from the University of North Carolina who were involved in conducting applied research into evaluation of the TEACCH approach or an issue significant to the identification and/or treatment of ASD. I will restrict the discussion of research to two projects which have the potential for direct application to the Australian context.

The first project aimed to investigate methods for teaching joint attention and symbolic play to preschoolers with an ASD (discussions were held with co-investigator Dr. Brian Boyd, PEARLS research programmes, Department of Allied Health, School of Medicine, University of North Carolina at Chapel Hill). The focus of this project was on training classroom teachers (familiar with TEACCH and other approaches) to teach joint attention/symbolic play by embedding social tasks in the curriculum taught to the entire class over the school day. The researchers have task-analysed ‘joint attention’ and ‘symbolic play’ into specific sub-skills to be taught in a cumulative manner (analyses are presented in a manual made available to teachers). ‘Joint attention’ and other basic social skills such as ‘requesting’ are conceptualised as pre-requisites for the more complex skill set which comprises ‘symbolic play’ and are taught individually. Teachers participating in this research were required to provide the preschoolers with an ASD with 1) three opportunities for structured interaction per day, and 2) two 10-minute individual sessions per week during which skills are actively taught. This research project is highly relevant to the preschool and early intervention contexts in Australia as it provides a systematic and structured methodology for teaching children with an ASD the prerequisite skills necessary for initiating and sustaining social interactions with peers.

The second investigation, which is part of a larger research programme called the Sensory Experiences Project, was discussed with Grace Baranek (Professor and Associate Chair for Research, Division of Occupational Science, University of North Carolina at Chapel Hill).
Professor Baranek is Principal Investigator on the programme which consists of six studies designed to meet three research goals she described as –

1. Mapping the maturational changes in sensory features and responses from the preschool to school years in children with an ASD and two comparison groups (children with developmental delay and those with normal development);

2. Examining the impacts of specific sensory experiences on ASD children's day-to-day functioning;

3. Establishing the risk factors relevant to development of atypical sensory patterns in children with an ASD.

Previous research initiatives have shown that children with an ASD possess sensory features and responses which differ to those of children with developmental delay and those with typical development. Professor Baranek has also examined atypical sensory features in children with an ASD plus other developmental disabilities, and conceptualises these as involving three sensory response patterns: Hyper-responsiveness (child responses function to assist the child in avoiding [often aversive] sensory stimuli), Hypo-responsiveness (child responses to sensory stimuli are minimal or diminished), and Sensory seeking (child exhibits an intense need for particular sensory experiences). Future studies will explore how these sensory response patterns impact on ASD children's functioning in the classroom and home context. Professor Baranek has also designed an experimental methodology which allowed for multi-method data-collection via questionnaire and interview administration to parents as well as play-based sensory assessments of the children with an ASD. The questionnaire component of the research into sensory features includes administration of the Sensory Experience Questionnaire (SEQ) to parents who are invited to describe their child's sensory experiences in relation to hyper- and hypo-responsiveness. Empirical investigations into the psychometric properties of the SEQ (reliability and internal consistency are adequate) support its utility as an instrument for identifying sensory patterns in young children with an ASD and other developmental disabilities.

The project under discussion comprised a longitudinal online survey investigation into the sensory experiences of children with an ASD in order to determine possible subtypes. This project aims to collect information on a national level as its focus is on drawing normative conclusions regarding sub-classification of sensory responses in ASD. Data had been gathered from 1,200 participants to the date of my discussion with Professor Baranek and she was in the process of conducting preliminary statistical analyses on these. This project was implemented on the basis of a two-year research grant obtained through the National Institute of Child Health and Human Development Federal American Recovery and Reinvestment stimulus package of October 2009.

In discussing future research initiatives necessary for continued advancement of best practice and evidence-based treatment for individuals with an ASD, Professor Baranek voiced the opinion that investigations should extend to collection of physiological data (e.g., use of Electroencephalography [EEG] to record electrical activity in the brain) which could be used in addition to observations of behaviour and administration of surveys to obtain a more in-depth and inclusive understanding of the experiences of individuals with an ASD. She agreed that investigation involving placement of sensors on children with an ASD could
create distress and stated that her introduction of Electromyography (EMG) measurement appeared to result in attrition of participants who had an adverse reaction to this type of data-collection despite having undergone an extensive desensitization process.
MIND INSTITUTE

Background:
The MIND (Medical Investigation of Neurodevelopmental Disorders) Institute is a multidisciplinary research facility connected to the University of California in Davis. This Institute was founded in 1998 by six high profile families, five of whom had sons with an autism-based disorder, who wished to fund and promote medically-oriented research into a cure for autism and other Neurodevelopmental disorders (i.e., ADHD, Fragile X Syndrome, and Tourette Syndrome). This initial emphasis on discovering a cure for autism was expanded to include research into identifying best practice treatments to remediate autism-based impairments and prevent exacerbation of deficits. The MIND Institute has also been active in increasing awareness and understanding of the issues surrounding children with a neurodevelopmental disorder and their families. This Institute has a world-class reputation in research and has made a substantial contribution to best practice treatment technologies for infants and young children with an ASD through research initiatives such as the Early Start Denver Model, Autism Phenome, and Infant Sibling Study projects.

The focus of my visit to MIND was on investigating the Early Start Denver Model (ESDM), developed by Sally Rogers (Professor, Department of Psychiatry and Behavioural Science, School of Medicine, University of California in Davis) during her tenure at the University of Colorado. The ESDM was designed to be a preschool intervention for children with a confirmed or suspected autism disorder but now extends to infants as young as 12 to 18 months old and contributions to its evaluation have been made by Geraldine Dawson (Professor, Department of Psychiatry, School of Medicine, University of North Carolina at Chapel Hill). A pre-visit review this model indicated that intervention was based on exposing the child to developmentally-appropriate play activities, prompting the child’s usage of particular skills (e.g., pointing, labelling an item) and reinforcing correct usage of skill or approximations to this.

The ESDM is grounded in developmental theory which takes the perspective that acquisition of skills in areas of functioning such as cognition, socialisation, and language occurs in a (reasonably) predetermined sequence. Therefore, intervention should focus on encouraging the child with an ASD to acquire any ‘missing skills’ arising from autism-based impairments in the sequence which approximates normal development. Further to this, ESDM interventions assist children to build skills within a relationship (i.e., parents and therapists) and a broad developmentally-appropriate activity (i.e., play). The adult-child relationship is considered to be central to remediating specific deficits (arising from autism impairment areas) and, by establishing social connectedness with other people, reducing repetitive and stereotypic behaviours which often result in the child becoming socially isolated.

Reason for Studying the MIND Institute:
My primary motivation in investigating the Early Start Denver Model (ESDM) was to become familiar with its applications as an intervention for young children (from 1 to 4 years) with an ASD who, due to their high needs, would be at risk of becoming socially isolated in the educational environment. I was particularly interested in identifying the specific educational concepts and techniques for intervention delivery which distinguished ESDM from other prevalent intervention approaches designed for children with an ASD, such as Pivotal
Response Training, DIR/Floor Time, and Hanen. The data-collection methods used to monitor and evaluate child responses to ESDM intervention were also of great interest as these were reported to be less time-consuming and potentially less likely to undermine the quality or frequency of adult-initiated observations and teaching initiations during therapy sessions.

Observations, Activities and Discussions – CLINICAL:
The ESDM laboratory aims to address four goals in serving the ASD community through its clinical, research and training initiatives. These are stated as: investigation of the developmental profiles of children with an ASD; remediation of the deficits which limit developmental progression via early detection, early intervention and family support; contribution to training professionals intending to work with children with an ASD; and raising community awareness of the experiences and needs of children and adults with ASD. These goals are reported to pertain not only to the ASD population but also to children with communication disorders and global developmental disabilities.

During the visit to the MIND Institute, I was provided with the opportunity to observe four ESDM therapy sessions and one programme review session. These activities were undertaken with two or three ESDM therapists who provided detailed descriptions of all key aspects of this model as well as their experiences in conducting therapy sessions with children and providing parent training and support. I was also able to view the materials used for assessment and data-collection purposes. I met with Professor Sally Rogers briefly and had numerous discussions with Sally Orzonoff (Professor, Department of Psychiatry and Behavioural Science, School of Medicine, University of California in Davis) regarding the development of educational materials for professionals and parents and research initiatives designed to evaluate the efficacy of ESDM interventions for children aged 12 to 24 months.

The therapy and review sessions were undertaken in the laboratories set up for the ASD Sibling and ESDM research projects. These laboratories contained four child assessment/therapy rooms attached to an observation room fitted out with audiovisual and eye-tracking recording equipment. The therapy rooms contained child-size table/chairs and most toys/objects used for play were kept out of the child’s view in cabinets on the periphery of the room. Children were exposed only to the toys/objects which were relevant to the area of skill being worked on and, once a toy became extraneous to the child (e.g., child might have indicated that (s)he did not like the toy or (s)he did not orient to it) it was removed and replaced with another similar option. All sessions (duration was approximately 2 hours) involved one child, two or three therapists and a parent who observed the child’s responses the play activities. Data-collection occurred via audiovisual recording and paper and pencil instruments.

Discussions regarding the theoretical foundations of the ESDM confirmed its strong grounding in developmental psychology and eclectic focus in incorporating a number of approaches to intervention including Pivotal Response Training, DIR/Floor Time and basic learning principles arising from Applied Behaviour Analysis (ABA) (e.g., shaping, chaining and positive reinforcement). My impression is that, rather than representing a separate and distinct framework for intervention, ESDM has incorporated a number of approaches to skill-building for children with an ASD and developed an innovative structure for intervention design and delivery in the therapy and home contexts. Professor Rogers and the ESDM
therapists I spoke with explained that, in addition to being an eclectic intervention approach which uses ABA and other methods, it is intensive and requires approximately 25 hours therapy time per week (usually) in the child's home environment. Although there is no formal requirement to rearrange the physical structure of the home, it is recommended that therapy be formally timetabled and conducted in a designated learning area within the home. Since ESDM has been developed for implementation in the natural environment, much focus has been placed on methods for training therapists and parents in ESDM strategies. Discussion on ESDM intervention delivery indicated that therapy was undertaken by a team of adults including ESDM, other therapists and the child's parents. This team administers an individualised programme which determines therapy objectives, therapy strategies and activities, target skills to be developed, and play materials. One designated senior ESDM therapist is responsible for data-collection, monitoring of child progress, and therapist/parent training. Professor Rogers stated that parental involvement was essential to embedding the ESDM intervention in the day-to-day activities and interactions involving the child. Therefore, she had focused some of her more recent research and clinical writing on establishing ESDM as a manualised intervention for children with an ASD (i.e., co-authored a manual with Professor Dawson for professionals and parents titled, Early Start Denver Model for Young Children with Autism: Promoting Language, Learning, and Engagement, published in 2010) as one means of disseminating information on ESDM to the professional and caregiver communities. Professors Rogers and Ozornoff emphasized the importance of offering parents intensive training in key methodologies and monitoring their application of these in the home environment to ensure accuracy.

Discussions with ESDM therapists and direct observations of therapy sessions with children provide evidence of a multi-phase process for implementation of ESDM interventions which includes 1) child assessment, 2) selection of goals and learning objectives, 3) development/delivery of therapy sessions, and 4) review of child progress. Assessment is undertaken prior to intervention development. The child is required to participate in a detailed evaluation of his/her level of skill in key developmental areas including receptive communication, expressive communication, social skills, imitation, play, cognition, fine and gross motor skills, and personal independence. The Early Start Denver Model Curriculum Checklist (written by Professors Rogers and Dawson, published in 2010) provides a sound basis for establishing the ASD child's repertoire of mastered, emerging, and missing skills so that specific intervention targets might be determined. Intervention programmes are tailored to meet the ASD child's particular needs and to build (in a cumulative manner) skills across all areas of development. Selection of appropriate goals and specification of objectives is essential to ensuring the child with an ASD receives access to effective intervention. Because ESDM centres on deliver of intervention via an adult-child relationship, strong emphasis is placed on the methods therapists and parents will utilise in initiating therapy-oriented play with the ASD child and activity engaging him/her in activities designed to build specific social, communication and other skills. Evaluation of child progress is reported to be continuous, with ESDM therapists completing post-session checklists which allow them to rate and describe any forward movement in skill development. These therapists also use a Communication Book to record information for the therapy team regarding any interactional methods or toys which were successful in engaging the child during sessions. These methods/toys are then used across sessions (by therapists) and within the context of day-to-day routines (by parents). I was not able to view actual data-collection samples and relied primarily on therapist descriptions of these.
A number of established intervention approaches appeared to be integrated in the therapy sessions I observed, thus confirming the eclectic nature of ESDM. Pivotal Response Training (PRT) was evident in relation to the target skills addressed and the intervention techniques used to assist the child with an ASD to engage in these. PRT can be described simply as a framework in which the prerequisite skills for more complex behaviours are systematically taught to the child using basic behavioural principles (e.g., Koegel et. al., 1993). These prerequisite skills are referred to as ‘pivotal behaviours’ because they are believed to have a broad effect on behaviours required by the child to communicate and socialise in an effective (and as close to age-appropriate) manner as possible. Motivation and responsiveness to social cues are considered to be pivotal to the development of effective social, play, and communication behaviour in children with an ASD. The children I observed were highly familiar with their ESDM therapists and the format of therapy sessions. The therapists were observed to use specific PRT strategies including: reinforcement of approximations to target skills (e.g., In responding to the therapist query – “What is this?” a child might be required to use a sentence stem “It is a blue block.” That child would receive praise for a partial utterance which approximated the target response such as “Blue block”). In addition, therapists used natural rather than contrived reinforcement (e.g., if a child stated “doll” to signal interest in this toy, the therapist provided immediate access to the doll rather than praise for speaking); and presented multiple examples of the same concept (e.g., in teaching the special concept “in” therapists prompted children to place various items in various locations). Because PRT has at its foundation key Applied Behaviour Analysis principles, it can be concluded that this latter intervention approach is also embedded in ESDM.

As mentioned earlier in this report, the adult-child relationship is essential to effective implementation of ESDM interventions. Relationship building strategies such as rapport, open acceptance of the child (as well as his/her parents), knowledge regarding the child’s interactional limits and tolerance of social stimuli, and understanding and non-judgement of any challenging behaviour, are reported to be actively addressed by therapists. The therapist-child dyads I observed were high familiar with one another and both parties ‘in the relationship’ were able to attend and respond to social initiations during play. The therapists appeared to be sensitive to the childrens’ task/toys preferences and capacity to deal with instructional demand. There were several instances of children becoming mildly upset (e.g., when required to remain on-task beyond their tolerance level or when promoted to attend to a less preferred play activity) and these were dealt with in a sensitive and calm manner by therapists. The format for implementing sessions was observed to be flexible and appeared to require therapists to make multiple on-the-spot decisions about creating appropriate play opportunities. The strategies used to engage children in play included shadowing (e.g., the therapist incorporated herself in the child’s solitary play [if this occurred] by commenting, handing the child an object or introducing a new toy); providing a prompt (e.g., the therapist set up a preferred activity and invited the child to engage in cooperative play with her); and following a child initiation (i.e., the therapist focused and elaborated on any comment or social gesture made by the child during play). ESDM therapists reported that, despite the systematic and structured determination of learning objectives, target skills and strategies for building these, they had considerable autonomy in designing the format of sessions and modifying these during their implementation.
Observations, Activities and Discussions – RESEARCH:
The ESDM laboratory is a clinical research facility and as such provides a basis for continued audiovisual and paper and pencil data-collection of all ESDM assessment, therapy and intervention review sessions. Professor Rogers appears to have utilised this rich source of data for the purpose of generating publications in peer-reviewed journals as well as writing manualised books. Her research findings have also become the foundation for development of training programmes targeting professional and family audiences. In this manner Professor Rogers has made substantial contribution to the dissemination of key findings on ESDM-driven early intervention for children with an ASD and their families. During my visit to the MIND Institute, Professor Rogers was writing another manual for parents of infants with suspected developmental delay and she was generous enough to allow me to view this manuscript in its unpublished form. Professor Rogers and colleagues have been involved in a two-year long randomised, controlled trial of ESMD, the results of which were published in February 2010. In addition to representing one of the first such trials of an early intervention for children with an ASD, the findings of this trial showed significant improvements in cognitive ability, adaptive behaviour, and autism diagnosis (i.e., change from Autistic Disorder to Pervasive Developmental Disorder- Not Otherwise Specified) in the children who received access to ESMD intervention. The comparison for this trial comprised a group of children with an ASD who accessed community-based early intervention. This focus on a randomised controlled trial such as this is considered to be a more robust demonstration of intervention efficacy than n = 1 experimental designs.
Background:
The Central California Autism Centre (CCAC) is a clinical treatment and research facility situated within the Department of Psychology at the California State University in Fresno. This facility offers therapy services to children with an ASD ranging in age from 18 months to 6 years. Services are child-centred and individualised, and aim to: 1) build specific skills (as opposed to broader abilities) in key areas of child functioning including language, motor skills, self-help skills, social skills, and pre-academic skills, and 2) address autism-based behaviours (e.g., stereotopies, toe-walking, echolalia) which prevent integration of the child into mainstream school environments and limit his/her learning opportunities. Skill building interventions are developed and delivered in accordance with Applied Behaviour Analysis (ABA) principles which have undergone robust investigation in clinical research. Behaviour change interventions are based on Functional Analysis (FA) procedures to establish the adaptive value of apparently non-adaptive responses; these procedures have also been submitted to continuous evaluation in the research literature. Delivery of all treatment services occurs at the centre and this is an interesting point of difference to the majority of Applied Behaviour Analysis approaches which are implemented almost exclusively in the child's home environment. Parent involvement is incorporated via provision of consultation meetings, training seminars and family support groups. Treatments are implemented by teams of junior and senior therapists who are students completing undergraduate and master's level studies in Applied Behaviour Analysis under the supervision of the Applied Behaviour Analysis Programme Coordinator who is a Board Certified Behaviour Analyst.

Reason for Studying the Central California Autism Centre:
The Central California Autism Centre came to my attention in 2007 when I attended the Applied Behaviour Analysis International Conference in Chicago. Centre staff who worked as academics as well as clinicians presented a series of papers on their innovative implementation of functionally-derived behavioural interventions. I became interested in their flexible application of ABA techniques to assist children with an ASD to develop functional skills capable of being generalised to new environments. I also wanted to learn more about the FA frameworks they had developed to create positive change autism-based behaviours which are highly resistant to generic treatment approaches. Finally, discussions with CCAC staff centred on the organisational and personnel aspects of this centre indicated that effective services could be delivered by well-trained students, thus reducing substantially the funding resources needed offer quality services to the community.

Much of my career as a practitioner in the autism field has been dedicated to assisting individuals with an ASD to replace highly challenging behaviour with more positive responses as one means of increasing their quality of life. This focus has shaped my research as well as clinical activities and involved me in investigations of the research literature to identify the most effective and evidence-based frameworks for changing the behaviour which stigmatises individuals with an ASD and causes significant disturbance to their self-esteem and sense of worth. This search, and my clinical experiences, have clearly indicated that generic, label-driven interventions are not effective because they do not address the needs of individuals with an ASD. FA, which contrasts label-driven interventions, is embedded in established theories and principles for assessing/treating challenging
behaviour and a value system which emphasizes the dignity and rights of the individual with an ASD. FA has a strong research history which dates back to the 1960s and numerous empirical studies have demonstrated the effectiveness of FA techniques in treating highly challenging behaviour in children and adolescents with an ASD. However, in the early 1990's, major figures in the field noted several important limitations in FA, specifically: in directly transferring data-collection procedures developed in the laboratory to social contexts where these procedures do not necessarily apply; in generating generic labels (which do not reflect the individual's actual experiences or variations in these) to understand the reasons for challenging behaviour; and exclusion of the individual as an informant on his/her own behaviour. Significant energy has been exerted to address those limitations via translational research which aims to study challenging behaviour in applied contexts (e.g., schools and homes) and to generate evidence-based intervention procedures which are relevant to practitioners in the field. The CCAC has an active translational research programme pertaining specifically to the behavioural needs of children with an ASD and I was particularly interested in observing its implementation.

Observations, Activities and Discussions – CLINICAL:

During my visit at the CCAC I was provided with the opportunity to conduct numerous observations of FA and ABA interventions in action, engage in discussions with researchers on initiatives into translational research projects, and view the administrative procedures used to run clinical programmes (involving children with an ASD and their families), as well as the paper-and-pencil/electronic instruments for recording key information during intake, assessment, caregiver training, and programme evaluation. All clinicians and researchers connected to the CCAC were extremely generous with their time.

During my discussions with Dr Amanda Adams (Coordinator of Applied Behaviour Analysis and Director of CACC) I learned that ABA interventions implemented in the CACC differed to those which are typically adopted in Australia for children with an ASD on a number of important levels. First, interventions adhered closely to well-researched behavioural principles (e.g., shaping, chaining, behavioural momentum) rather than specific models for delivering intervention. The discrete trial training approach, involving adult-directed, one-to-one sessions in which the child is drilled in producing skills on a repeated basis until these are mastered, is kept at a minimum in this centre. Dr Adams reported that, while this approach was effective in helping children to "produce a response on demand" (e.g., "Point to the blue square"), their data and clinical experiences indicated that there was minimal generalisation of skills to relevant situations in the natural learning situation (i.e., the concepts of 'blue' and 'square' were not recognised at school). The second unique feature of CACC interventions related to the emphasis on developing treatment areas which approximated the natural environment. I was able to observe children participating in activities in learning spaces which looked like age-appropriate classrooms rather than clinic offices or laboratories. Dr Adams reported that children received the majority of their interventions within groups (3-5 peers present) to help them learn skills and cope with social demands on a concurrent basis. The CACC model for service delivery also established 'buy in' from other organisations, providing services to the children with an ASD (and his/her family) by involving their personnel in an active collaboration in which their knowledge and goals were actively incorporated in development of interventions delivered in the CACC. The CACC also offered outreach services to schools and other educational settings to assist with concerns or difficulties regarding the child that occurred in those environments. Dr. Adams commented...
on anecdotal findings which suggested that attributing time to forming an alliance with personnel who dealt directly with the child had a strong positive impact on intervention success and deemed this process as being important to service delivery. My observations (often resulting from unannounced [to the staff] visits) of numerous groups indicated that children were comfortable, well-oriented to their therapists and learning activities, and capable of basic peer interaction. I was impressed with the 'fun' aspect of learning activities and the use of humour and positive recognition to engage children in the educational process.

The time spent in discussion with Criss Wilhite (BCBA and founder of the ABA programme CSU) was valuable in providing me information on the procedures used to involve parents in the interventions developed for their children by CACC therapists. Ms Wilhite was responsible for designing the procedures for parent engagement, writing parent training manuals and coordinating parent training programmes. She reported that parents were involved in weekly team meetings with the therapy team (i.e., therapists and supervisors) who were working with their child. These meetings are set up to discuss intervention goals, the child’s progress towards meeting these goals, and any concerns or difficulties parents might be experiencing. In addition to these meetings, parents are required to participate in weekly Parent Training Seminars that run in 15-week blocks. In discussing these seminars, Ms Wilhite emphasized that their content was re-focused away from discussions of childrens' diagnostic labels and impairments to the practical strategies for improving parenting and parent-child relationships. Content of sessions is task-analysed and scaffolded to assist parents in understanding the behavioural principles used to build the child’s skills and applying the practical techniques arising from these principles in the home environment. One principle is presented per week (e.g., reinforcement) and parents learn about how each principle is used to build a skill or replace an unwanted behaviour. They are then taught a number of practical strategies (e.g., delivery of praise, use of differential reinforcement) they can use in their homes to address the particular difficulties they are experiencing. The application of strategies is guided by a weekly homework exercise which is created in relation to the child’s needs. I was interested in the parents’ responses to learning about concepts and strategies which are potentially complex and challenging. Ms Wilhite discussed particular procedures she had developed over time to make seminars comprehensible and inviting to parents and these included partnering parents with one therapist who assisted with completion of practice seminar exercises, use of videotaped sequences in which therapists demonstrated particular strategies with children, and hands-on practice sessions during which parents applied a strategy to their child in the presence of a therapist who provided immediate feedback on accuracy.

Observations, Activities and Discussions – RESEARCH:
My observation and discussion of Functional Analysis processes and applications occurred within the context of learning about translational research. I was able to observe a number of assessments and interventions in action and discuss the methods used to collect and analyse behavioural data. I was also invited to attend the one-day Fresno State Applied Behaviour Analysis Conference during which key researchers discussed current and future trends in FA applications for the natural context. I have limited the discussion below to the innovative approaches being used to conduct FA at the CACC which have direct relevance to the Australian context.
In setting the foundation for a review of the translational research into FA methodologies and applications, it is important to state that FA is best described as a systematic process for doing assessments which lead to individualised interventions. The assessment process must be conducted carefully in order to allow for subsequent inventions to be effective in remediating some aspect of the individual’s behaviour which prevents him/her from positive engagement with the social environment. This remediation aims to replace an unwanted or challenging behaviour with a positive alternative which helps the child/adolescent with an ASD gain access to the same outcomes that are secured by the unwanted behaviour. Over time, the unwanted behaviour becomes highly ineffective and unnecessary as the child/adolescent experiences the valued outcomes which result from the new positive behaviour. At the core of FA assessment is the search for the reasons for unwanted or challenging behaviour. If clinicians are clear about the purpose of this behaviour, then they are more likely to recognise that ‘behaviour problems’ are (from the child/adolescent perspective) highly effective coping responses which help him/her in adapting to demand. FA is considered to personalise the assessment and intervention processes and dignify the individual with an ASD by refraining from judgement, negative labelling and stigmatisation.

There are three models for conducting Functional Assessment which are presented here from least to most labour intensive and data-rich. Dr Greg Hanley (Associate Professor, Western New England College) argued that each model could involve either closed- or open-ended assessment methods. Indirect Assessment collects data via administration of rating scales, questionnaires and interviews with caregivers. There is no direct observation of the challenging behaviour. Indirect Assessments can be close-ended when information on the functions of behaviour is gathered via rating scales administered to caregivers or open-ended when in-depth clinical interviews are conducted. Descriptive Assessment includes direct observation of the challenging behaviour without any experimentation. Data collection methods include A-B-C charting. These assessments can be close-ended when computer codes are used to track behaviour, antecedents, and consequences, or open-ended when hand-written narrative recordings of behaviour are made. Functional Analysis involves direct observation and experimentation. In discussing the issue of experimentation, Dr. Greg Hanley reported on the typical laboratory-based approach which would involve manipulation of post-behaviour variables thought to influence the behaviour. This manipulation would occur in a series of test and control conditions (as displayed below) involving three 10 minute trials per condition.
A) TEST CONDITION (CONTINGENT ATTENTION)

The child is required to play with a non-preferred toy to set up the 'attention' condition. That is, the child will become bored and be more likely to approach another person to gain attention.

<table>
<thead>
<tr>
<th>Child uses positive approach behaviour</th>
<th>Child hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGNORE</td>
<td>GIVE ATTENTION</td>
</tr>
</tbody>
</table>

B) CONTROL CONDITION (NON CONTINGENT ATTENTION)

The experimenter removes the hit-attention contingency by providing non-contingent and continuous attention. If the hitting is reduced, the contingency is confirmed.

In discussing the guidelines for FA assessment methods suitable to the applied environment and capable of gathering accurate information without causing undue disturbance to child/adolescent or his/her caregivers, Dr Greg Hanley made the following recommendations:

- Always do an open-ended Indirect Assessment via clinical interview. Do not use close-ended Indirect Assessment methods such as self-rating scales as these rarely identify the variables which have the greatest influence on the child's/adolescent's behaviour. These rating scales also do not allow for exploration of contextual factors;

- Focus on quick open-ended Descriptive Assessment methods such as hand written narrative recording during one or (at most) two 30 minute observation sessions;

- Simplify experiments involving manipulation of variables by making them briefer (i.e., total of 5 minutes), conducting them within the child's/adolescent's usual routine of activities, and estimating rather than testing for key functions.

My observations of the FA assessments conducted in the CACC confirmed the significance of undertaking in-depth clinical interviews with the caregivers (i.e., parents and teachers), both for extracting highly relevant information on the child's behaviour and also building rapport with the people responsible for implementing interventions in the natural environment. Discussions with the CACC therapists also indicated that the time period needed to train caregivers to participate in experiments was not great (i.e., 2 – 4 hours), and a number of parents had become skilled in not only collecting data on their child's behaviour but also interpreting these data for important trends.
**CAMBRIDGE UNIVERSITY**

**Background:**
The Autism Research Centre (Cambridge University) has achieved worldwide recognition for its research into ASD, and pioneered the research into early screening for possible autism disorder in children aged 18 months. This research initiative (Baron-Cohen, Allen & Gillberg, 1992) led to development of the CHAT (CHecklist for Autism in Toddlers), which was designed as a screening tool to be used by primary health care workers or clinicians in children's services to record the absence of significant social behaviours such as joint attention and pretend play as indicators of subsequent diagnosis of autism. The absence of these behaviours became the basis of the CHAT because they are present by 18 months of age in typically developing children. Poor scores on the CHAT were shown to predict later autism but this screening tool did not succeed in identifying those children with functioning autism and Aspergers Disorder. The CHAT is also limited in that its 14 items (i.e., 9 parent self report questions and 5 clinician observation questions) were rated via categorical forced-choice as either 'Yes' when the behaviour was present or 'No' if it was not. The most recent studies undertaken by the research team focused on screening and early detection of autistic disorder have focused on revising the CHAT to include a greater pool of items and a quantitative system for recording child responses. This initiative has led to development and evaluation for the Q-CHAT (Quantitative-CHecklist for Autism in Toddlers).

**Reason for Studying the Q-CHAT:**
Although more is now known about the autism spectrum and how this affects the manifestation of symptoms in different subgroups of children, and there is greater proliferation of autism-specific tests to be used in drawing diagnostic conclusions, accurate identification continues to depend on the absence of age-appropriate behaviours and the presence of atypical responses. Therefore, diagnosis continues to be based on accurate observation and interpretation of child behaviour in the assessment environment. In addition to this, there is a paucity of information regarding autism symptomatology in very young children and this leads to a loss of crucial early intervention time in children who show clear evidence of impairment when they are older. I was highly motivated to learn about the Q-CHAT in relation to its construction and clinical applications.

**Observations, Activities and Discussions – CLINICAL AND RESEARCH:**
I met with Dr Carrie Allison (Autism Research Centre, Department of Psychiatry, University of Cambridge) who is a lead researcher on the Early Screening and Identification of Autism programme to learn about early screening and in particular the Q-CHAT. It relevant to note that discussions with Dr Allison indicated that the term *Autism Spectrum Disorder* (ASD) has been replaced by *Autism Spectrum Condition* (ASC) in England to promote a more respectful means of referring to individuals on the autism spectrum. In discussing the functional levels of children with an ASD, which are heavily impacted by presence/extent of cognitive disability, she used the term Learning Disability to describe children who in the Australian context would be referred to as Intellectual Impaired.

Dr Allison elaborated on the methodological reasons for the CHAT possibly showing low sensitivity as a screening tool for higher-functioning children with an ASD in the general population. These included the wording of questions (e.g., "Has your child ever .......?") which
could bias parents towards under-reporting absences in behaviour if it had been exhibited by
the child on a rare basis. This led researchers to conclude that reduced frequency rather
than absence of joint attention and pretend play behaviours would be significant in the
detection of impairment in higher-functioning children. She also explained that, by adhering
to an ‘absence of typical behaviour’ model in constructing the CHAT, there was no basis for
screening for the presence of atypical responses such as repetitive and stereotypic
behaviour, thus further reducing the sensitivity of this screening tool with children who
showed evidence of such atypical development.

In discussing the Q-CHAT, Dr Allison referred to research initiatives (first reported on in
2008) designed to revise the CHAT in order to develop a screening tool with increased
sensitivity capable of identifying toddlers (i.e., aged 18 – 24 months) at risk of developing
ASC. The key features of the Q-CHAT were listed as follows:

- Focus on parent reports alone to identify the absence of key behaviours in children.
  Parent-reports had been shown to be as effective as parent- plus clinician-reports in
  previous research;

- Inclusion of a Likert scale to present respondents with a range of response
categories to allow recording of behaviours which are present in the child’s repertoire
but occur with less frequency. All 25 items are rated on a 5-point scale presented in
relation to increased frequency of behaviours and item 4 contains a sixth response
option to denote absence of language;

- Expansion of items to facilitate recording of impairment in language development,
  usage of social communication and presence of repetitive behaviour.

Dr Allison discussed a number of interesting findings based on large-scale administration of
the Q-CHAT to parents of 779 unselected toddlers and parents of 160 toddlers and
preschoolers with a confirmed Autism Spectrum Condition. These included that children with
an existing ASC diagnosis received significantly higher scores on the Q-CHAT than
undiagnosed toddlers and boys in the unselected group and showed greater evidence of
social and communication difficulties as well as repetitive behaviour issues than girls. I can
see the clinical utility of incorporating the Q-CHAT in the screening protocols developed for
children with a suspected autism disorders in the Australian context.

Dr Allison discussed her current involvement in large scale epidemiological studies involving
the Q-CHAT and more in-depth assessment of child participants. The findings of these
studies continue to be reported in the literature and continue to play a significant role in
shaping understanding and application of early screening procedures on an international
level.
Background:
The National Autistic Society (NAS) was established in the early mid-1960's to support families and professionals working with individuals with an ASD. This earliest autism-specific service has, and continues to maintain, strong connections with researchers and Universities involved in conducting studies into the medical, psychological, educational, and community/societal factors impacting individuals with an ASD. These connections have shaped an ethos of recommending only those intervention approaches supported by empirical investigation. The NAS used research evidence, clinical experience and feedback from individuals with an ASD and their families to develop the SPELL framework which guides the society's training on autism and provision of autism-based services. This framework is based in cognitive learning theory and delineates five key pillars of best practice in autism through the mnemonic SPELL (Structure, Positive approaches and expectations, Empathy, Low arousal, Links). The SPELL framework underwent an extensive evaluation and revision in 2010 and, in addition to content and materials being updated, the mnemonic has been replaced with the title Understanding and Supporting Children and Adults on the Autism Spectrum but the pillars of best practice remain the same (I will continue to refer to SPELL in subsequent discussions to maintain consistency).

The recent evaluation referred to above has resulted in a training manual and CD produced jointly by the NAS and Tizard Centre at the University of Kent. The purpose of these materials is to provide professionals and caregivers with access to the SPELL framework and the associated strategies which arise from it. The intention is to aid personal learning and, as such, these materials cannot be used to train others unless an accredited SPELL training programme has been completed.

Reason for Studying the SPELL Framework:
My investigations of SPELL suggested that this framework would provide a strong basis for understanding the particular experiences and needs of children and adults with an ASD. I was interested to discover that SPELL had incorporated not only evidence from the research but self-reported experiences from individuals with an ASD in its development. SPELL also appeared to be recognising that autism-based difficulties could result from physiological and cognitive arousal triggered by adverse factors in the environment. This would remove, or at least minimise, the stigma arising from the child or adult with an ASD 'being the problem' and facilitate the view that (s)he is reacting to an aspect of the environment which is causing discomfort, disturbance or distress. SPELL appeared to have similarities with TEACCH in that it represented a humanistic and person-centred approach to intervention.

Observations, Activities and Discussions – CLINICAL:
The SPELL resource manual and accompanying materials were developed by Dr Julie Beadle-Brown (Senior Lecturer in Learning Disability, Tizard Centre, University of Kent) and Richard Mills (Director of Services and Research for the NAS). I met with Dr Beadle-Brown and Richard Mills to discuss the SPELL philosophy and its practical applications in children, adolescents and adults with an ASD. I was also able to observe and discuss the methods for implementing SPELL in the school environment at the Sybil Elgar School.
My discussions with Dr Beadle-Brown and Richard Mills revealed that SPELL was a person-centred approach designed for clients with intellectual and developmental disabilities, emphasizing five core values. The first value pertains to ‘individuality’ and guides practitioners to develop interventions that support the particular needs of the children or adults they are supporting and to remain person-centred at all times. The second value pertains to remaining ‘hopeful’ about the individual’s potential to learn and their own capacity to create meaning quality of life outcomes. The fourth value pertains to ‘respect’ and acknowledges the individual’s right to be different but also guides the practitioner to help and support the individual to minimise the disabling effects and adverse outcomes that might arise from his/her autism condition. The fifth value pertains to implementing ‘ethical’ interventions which do not restrict equal opportunity, adopt aversive or harmful techniques, or implement unsubstantiated theories.

In reflecting on my discussions with Dr Beadle-Brown and Richard Mills, it is my impression that a further five foundation principles are significant in having an impact on all planning processes, interactions (between personnel and individuals with an ASD), and intervention techniques. These are:

- **Autism is a spectrum condition** which results in individuals manifesting symptoms and behaviours in different ways. It is generally recognised that the spectrum represents autism subgroups with Autistic Disorder and Aspergers Syndrome being the two main diagnostic groups. However, SPELL recognises that there are other groups of individuals who cannot easily be placed in either of these groups because they do not meet the criteria needed for a diagnosis. It is essential that personnel become familiar with the individual they are assisting rather than any label that might be used to describe him/her.

- **The purpose of intervention is inclusion** into the key social contexts the individual with an ASD is either required to, or desires to, participate in. The extent of this inclusion would depend on the individual’s needs, tolerance, and personal goals. SPELL acknowledges that, for some individuals with an ASD, full inclusion in mainstream contexts is not possible. However, some form of appropriate social inclusion must be planned for this subgroup.

- **Sensory processing issues impact greatly** on individuals with an ASD and have often been identified as setting-event ‘triggers’ for repetitive, odd, or challenging behaviours. SPELL advocates physical structuring and environmental modifications known to place individuals with an ASD under conditions of low arousal and calm.

- **Positive approaches and expectations** should be maintained by personnel involved in providing services to individuals with an ASD. This focus not only enhances empathy and understanding from these personnel, but also guides them towards development of interventions which empower the individual with an ASD.

- **Focus on the individual’s aspirations and dreams** during planning and goal setting to ensure that (s)he has every opportunity to access those reinforcing events which are of greatest value to him/her.
I visited the Sybil Elgar School subsequent to my discussions with Dr Beadle-Brown and Richard Mills to see SPELL in a facility which had been adopting this approach for over a decade. Sybil Elgar has three sites and I spent the majority of my time in the secondary school (for ages 11 to 16 years) but also visited the further education facility (for ages 16 to 19 years). I was given a comprehensive tour of the school and access to observing a number of classes by Lucy Burholt (Lead Teacher). She described the strategies used by the school to incorporate SPELL across all curriculum areas and activities for the students who were diagnosed with autism and intellectual impairment. My observations indicated that the entire school contained clear physical structures to assist students with an ASD to locate significant places (e.g., toilet, lunch room) and areas within the classroom (e.g., free reading spot). All floors and outside play areas were carpeted to minimise noise and there were no fluorescent lights in evidence. My observations of the teachers indicated that they had developed a clear communication style and calm presence which offered the students a model for behaviour. There was extensive usage of structured visual prompts such as individual (daily or weekly) timetables, ‘if-then’ cards which linked particular positive behaviours with reinforcers, and emotion lists which presented students with a range of line drawn facial expressions to help them communicate how they felt. There was also a strong focus on providing students with the tools to communicate their needs and wants via access to communication boards and wallets, and teachers proficient in signing and reading students’ non-verbal communication cues. Ms Burholt discussed the importance of maintaining consistency in intervention approaches across individual teachers in the school and parents at home. Teachers were reported as continuing to update their skills in implementing the SPELL framework, and parents were coached in using specific strategies to deal with issues which arose at home.

Observations, Activities and Discussions – RESEARCH:
There was no discussion on research initiatives.
CONCLUSIONS

Applications in the Australian Context:
Our knowledge on the causation of autism disorders, their early detection, and treatment has increased considerably over the past decade on a worldwide basis. In Australia, much effort and funding have gone into dissemination of information to target audiences such as families of individuals with an ASD and professionals in the field regarding the impairments arising from this condition, their manifestation in day-to-day life, and their treatment via application of universal interventions. These approaches have contributed significantly to raising general awareness of ASD in the community and have offered some general guidelines for understanding and dealing with issues and difficulties which impact individuals' functioning. However, when it comes to laying a solid foundation for specialised, person-centred intervention developed to create long-term positive change in quality of life and equitable opportunities for accessing community resources and age-appropriate life experiences, these universal awareness-raising models fall short. I venture to say that, because we have focused on these models for service provision and professional education in the Australian context, we have somewhat lost our way. The important question is where do we go from here? My personal experiences and interactions with numerous professionals in Australia have led to the firm opinion that these people are highly motivated and committed to providing maximally effective services and are willing to undertake any learning activities required of them. It is these people I am extremely interested in supporting as a strong means of making a difference in the lives of individuals with an ASD.

The issue of early detection of infants and children at risk of developing an autism disorder is of great importance to the delivery of timely and intensive intervention services. The greatest impact of an infant screening programme would occur if it was conducted on a broad basis at repeated points in the child's early life even when parents have not voiced a concern regarding their child's development. Discussions with Dr Carrie Allison suggested that such screening should begin between the ages of 18 to 24 months and include large samples of children, some of whom might not appear to be at risk of developing an autism disorder. The latter suggestion arose from data which showed that early screening was successful in detecting social and communication delays (especially in boys) which could be addressed early in childrens' lives. The rationale behind advocating for such a large scale screening programme is based on the increasing incidence of ASD, with prevalence figures in the USA and England ranging from 1:150 to 1:100 children.

In deciding on the most efficacious intervention approach for children with an ASD, it is necessary to acknowledge that not all treatments, even those with a strong evidence base, are equally suitable or successful with all children/adolescents with an ASD. All the clinicians and researchers I met during my studies emphasised the complexities of developing targeted interventions to suit the entire autism spectrum. Clinical researchers such as Shahla Alai-Rosales, and Criss Willhite voiced the importance of 'getting to know the child rather than the label' as the key focus to be taken in making intervention decisions. Some of the factors to be examined in the process of understanding and remediating issues of significance to the individual child included: specific profiles of strengths, assets, and needs, level of functioning (micro-analysis of cognitive abilities), gender, and presence of comorbid
disorders such as anxiety. This latter issue of detecting comorbid anxiety was considered by researchers such as Patricia Howlin and Judith Gould to be of great significance to intervention development.

The intervention models I observed in the USA and England all incorporated active training of personnel and parents. These training frameworks were not informational (i.e., delivery of material to groups of participants) but focused more on providing trainees with practical hands-on experiences which allowed them to learn how to apply and modify (based on child responses) key intervention strategies. The general training process involved trainees in learning how to observe, apply, review, and re-apply specific intervention skills until these were mastered. It would be valuable to establish a training facility which allowed for such training to occur for professionals and parents of children with an ASD. This would allow for interventions to be linked across key contexts and ensure that children were treated in a consistent manner to aid their learning of the skills being taught. In addition to offering training in usage of intervention techniques, trainers also discussed guidelines for ethical delivery of services and were observed to speak about maintaining respect and acceptance of children at all times, ensuring all intervention goals and strategies emphasized the dignity and personal rights of the child, matching intensity of interventions to the child's capacity to tolerate these without distress, and teaching skills that help the individual meet his/her aspirations (for older children and adolescents).

One key aspect of interventions across all the centres I visited was precise and continuous data-collection on specific aspects of functioning (e.g., frequency of correct responses). This activity is generally not part of the intervention process in Australia and limits the capacity for objective decision-making regarding child progress and intervention effectiveness. My impression is that this activity was deemed important by the personnel I spoke to because they were well versed in the scientific method and its application to their day-to-day work with children. Establishing clear systems and opportunities for child-centred data collection and review within Australian education and mental health organisations which offer intervention services is of clinical and research significance.

In earlier sections of this report I have cautioned against partial dissemination of information to target groups, which can occur when participants are exposed to discussions of intervention strategies arising from a particular model such as TEACCH or SPELL without clarification of the philosophical principles and values which underpin those models. My impression is that partial dissemination contributes to professionals and parents applying intervention strategies almost via rote and with minimal understanding of how these strategies might work to create change or how long they must be applied for change to begin to occur. In advocating for dissemination of whole models and building an understanding of the scientific method, I believe that an autism-specific qualification for therapists who work with people who have an ASD is necessary.
**Dissemination:**
New knowledge will be disseminated on two levels – within the Bond University environment and the broader community context.

**Dissemination at Bond University** will involve lectures to students, mentoring of junior academics, and development of a University-wide seminar series. As Director of the Centre for Autism Spectrum Disorder, I plan to implement applied research projects (in collaboration with international colleagues) into specific aspects of intervention delivery. These research projects will entail training of participants (both parents and professionals) in application of evidence-based techniques. Finally, I will work towards development of a Graduate Diploma in Autism Spectrum Disorder Studies to be offered by the Faculty of Humanities and Social Sciences at Bond University.

**Dissemination in the wider community** will involve me in implementing interventions in home and school environments to allow for observation and learning by parents/adults, developing professional training workshops to assist acquisition of knowledge on intervention techniques, initiating discussions with the Gold Coast District Education Office to establish effective data-collection systems for children with an ASD, plus to identify several schools to participate in trial application of Functional Analytic assessments and interventions. As Director of the Centre for Autism Spectrum Disorder, I plan to conduct a series of community events during which key international speakers will present on their areas of expertise.
RECOMMENDATIONS

First, screening for early detection of possible ASD is crucial, and implementation of such a programme in the Australian context would lead to improved quality of life and (on the part of government bodies) greater economic outcomes.

Second, training of education and mental health professionals should be re-directed away from descriptions of ASD and generic treatments for this condition. There is great value in development of training programmes which teach 'whole approaches' and methods for applying these in an individualised manner to meet need.

Third, practitioners (e.g., teachers) responsible for hands-on work require assistance in viewing themselves as scientist-practitioners and engaging in the data-collection, self-reflection and evaluation procedures which are crucial to ethical delivery of efficacious treatments.

Fourth, children and adolescents with an ASD are highly vulnerable to environmental conditions and these often lead to disengagement from learning. Schools which accept the responsibility of educating children with an ASD would assist them greatly by applying physical structuring and low arousal principles.

Finally, children and adolescents with an ASD have dreams and aspirations which should be acknowledged and included in any intervention developed to assist them.