Assessing Behavioral and Neurophysiological Outcomes of Intensive DIR® Intervention for Children with Autism

Lead Investigators: Devin M. Casenhiser, Jim Stieben & Stuart G. Shanker
The Milton & Ethel Harris Research Initiative

Therapists: Amanda Binns, Narmilee Dhayanandhan & Nadia Noble
Principal Clinical Advisors: Stanley Greenspan & Jake Greenspan with contributions from Yael Binya, Tim Bleeker and Cindy Harrison

ABSTRACT

TITLE:
Assessing behavioral and neurological outcomes of intensive DIR intervention for children with autism.

BACKGROUND:

Although ABA (Applied Behavior Analysis) models are the best studied and most popular forms of treatment for Autism, the DIR ® model (Developmental Individual-Difference, Relationship-Based Model is fast gaining popularity. While there is promising descriptive evidence for the success of DIR® intervention, there remains a lack of controlled scientific studies to evaluate its efficacy. Furthermore, there has been no systematic attempt to determine whether interventions can have an impact on neurobiological functioning.

OBJECTIVE:

To investigate the intervention at both the psychological and the neurophysiological level in an effort to document the effectiveness of DIR®

METHOD:

Participants: 50 children aged 2;1-5;2 with a diagnosis of an autistic spectrum disorder confirmed by ADOS and ADI-R criteria. 25 typically developing children who serve as a control group for the neurophysiological data (The typcially developing group receive assessments as with the treatment groups, but do not receive treatment).

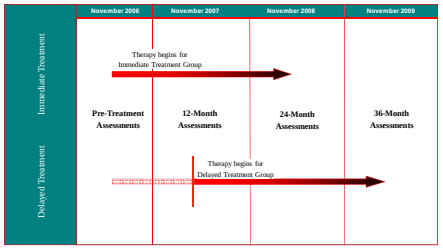
Procedure: The participants were assessed to confirm a diagnosis of an autistic spectrum disorder using ADOS and ADI-R. They were subsequently assessed for cognitive functioning and assigned to one of two groups using a random blocking procedure based on age and cognitive functioning. One group was randomly selected as the immediate treatment group. The other group was selected as the 12-month delayed treatment group. Both groups will receive a total of 24 months of DIR® therapy. Groups did not differ statistically in terms of age or cognitive functioning at the time of the first round of assessments.

TREATMENT PROGRAM

- The treatment program follows the method and techniques of DIR® as set forth in *The Child with Special Needs, Engaging Autism*, the *ICDL Diagnostic Manual for Infancy and Early Childhood* and the *DIR Floortime Techniques* training videos.
- Training of therapists, supervision and/or consultation is being provided by Stanley Greenspan, Jake Greenspan, Tim Bleeker, Cindy Harrison and Yael Binya.
- In keeping with the original model, primary caregivers are expect to conduct 20-30 hours of Floortime at home.
- Families meet each week for 2-3 hours with DIR® therapists (certified SLPs and OTs) for ongoing coaching/ instruction, evaluation of progress and setting goals. Participants receive 1 Floortime™ session, 1 speech-language session (as needed), and 1 OT session (as needed) each week.
- Although the program focuses on the child, therapists endeavor to treat the whole family in keeping with the DIR® philosophy. Families with difficulties beyond the scope or skills of the therapists are referred for external services as needed (e.g., social worker).

TIMELINE

The therapy phase of this study began October 30th, 2006.



ASSESSMENTS

Variable	Measure	Age-Range
Cognitive	Bayley-III	0-42
	WPPSI/WISC (preferred)	2;6-7;3
Language	Pre-School Language Inventory	0-6;11
	CASL (preferred)	3;0-26 years
Functional Skills	Vineland	0-18 years
	TABS	(used as process measure)
Social Emotional Functioning	SEGC (Bayley subscale)	(used as process measure)
	FEAS	(used as process measure)
Diagnostic	ADOS	2 – adult
	ADI	2 – adult
Sensory	Sensory Profile	
Social Reciprocity	Early Social Communication Scales	(used as process measure)
Electrophysiology	EEG/ERP	

Assessment Schedule

Electrophysiological assessments are administered every 6 months.

All other assessments are administered at

- pre-treatment
- following 12 months of treatment
- following 24 months of treatment.
- The delayed treatment group receives one additional assessment 12-months prior to starting their treatment.

Other Measures

- Parents will log hours spent providing DIR to their child each week.
- Concurrent histories are taken every 6 months to document supplemental treatments children might be receiving

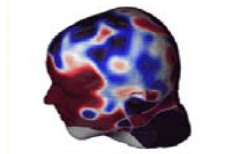
ELECTROPHYSIOLOGICAL ASSESSMENTS

We are conducting electrophysiological (ERP) assessments of face, emotion and eye-gaze encoding processes to look for treatment related changes in the brain. ERP components associated with face perception, emotion encoding and intentional eye-gaze behavior are known to be aberrant in children with autism. We expect to identify changes in both amplitude and latency of these face specific ERP components in children who successfully respond to treatment.

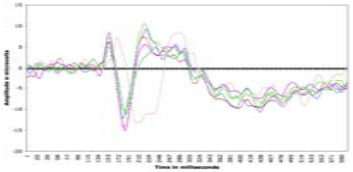
We are also investigating the effects of treatment on Mu wave suppression during an action-observation task. Mu rhythms are believed to be related to "mirror neuron" systems which are known to be aberrant in children and adults with autism and may underlie theory of mind deficits in this population. Although exploratory, we expect to find increased Mu rhythm suppression during observation of action in our children who respond favorably to treatment.

EEG assessments are being carried out using a dense-array (128 electrode) recording system (Electrical Geodesics Incorporated). Eye-tracking is monitored through a Tobii X-50 eye-tracking system fully integrated into the EEG recording data stream.

Children are provided with a 3 to 4 week training program to acclimate to the EEG nets and the testing format. Each family is provided with several "mock" EEG nets and are being trained to practice with net application procedures once per day prior to being tested in the lab. Children are also given a "mock" version of the tasks (using animations) to help acclimate to the testing environment.



Face, Emotion Gaze Task



N170 Face Specific ERP Component

PRIMARY ANALYSES

- In November 2007, we will compare the immediate treatment and delayed treatment groups to determine whether DIR® intervention had a significant effect on any of the measures (assessments) we are recording.
- Following 24 months of treatment, we will determine the magnitude of the gains made by children receiving intensive DIR® intervention.
- Analyses will be conducted between the parent treatment logs (which log the number of hours spent in treatment each week) and child outcomes to determine the strength of the correlation between the number of hours spent in treatment and a child's outcomes.
- Certain children may respond better to DIR® treatment than others. Accordingly, a cluster analysis will be conducted to determine whether it is possible to establish a profile that might suggest how successful DIR intervention will be for a child matching that profile.

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For additional information please contact:

Devin Casenhiser (dcasenhi@yorku.ca) or
Jim Stieben (jstieben@yorku.ca)
The Milton & Ethel Harris Research Initiative
York University