Applied Behaviour Analysis for Children and Youth with ASD and/or ID: Applications, Skills, and Evidence

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and Sheree Adams

CARD (NZ)

Outline

- Applied behaviour analysis
- Autism spectrum disorders & intellectual disabilities
- Evidence-based interventions
    - Early intervention
    - Education: Teaching functional skills
    - Behaviours that disrupt education
- Summary & directions for future
- Questions & discussion

Behaviour analysis

1. A natural science of behaviour
   - Behaviour of individuals is a product of interactions between their genes and unique environmental history
     - Radical behaviourism
2. A basic experimental science
   - Experimental analysis of behaviour
     - *Journal of the Experimental Analysis of Behavior*
3. A science studying experimental applications
   - to important human problems
     - *Journal of Applied Behavior Analysis*
4. A set of technologies based on the science
     - Textbooks, manuals, training

Applied behaviour analysis is 3 & 4

Evidence-based Practice

Evidence-based practice in education is the integration of the best available research with school staff* expertise in the context of student characteristics, culture, and preferences.

(Adapted from APA Task Force, 2007)

* i.e., teachers, assistants, RTLBs, etc. plus educational psychologist

Case study on "best available research" for evidence-based practice with respect to ABA in education

New Zealand Ministries of Health and Education. "Draft Evidence-Based Guideline for Autism Spectrum Disorder".

November 2006

ASD draft guideline relevant sections

- Part 1: Diagnosis and initial assessment
- Part 2: Supporting families
- Part 3: Ongoing assessment and educational interventions
- Part 4: Other interventions
- Part 5: Support & transition
  - Behavioural problems etc.
  - Maori perspectives
  - Pacific people perspectives

Comments on PART 3: ONGOING ASSESSMENT AND EDUCATIONAL INTERVENTIONS FOR LEARNERS WITH ASD

- ". . . all of Part 3 of the guideline was developed by a small working group consisting of five people with expertise in special education and ASD."
  - They cited "time and resource constraints" for their failure to review the evidence comprehensively. They resorted to their "practical experience and expert opinion"
  - None were educational psychologists nor behaviour analysts, nor had sufficient skills to review scientific literature, e.g.,

Example of ignorance in ASD Guideline

Internationally very well known review and recommendations:

- New York State Department of Health (1999). *Clinical Practice Guideline: Report of Recommendations: Autism/Pervasive Development Disorders, Assessment and Intervention for Young Children (0-3 years)*.

What did NZ ASD Guideline reviewers report on it?

POLICY GUIDELINES (NOT EVIDENCE BASED)

Level of Evidence: x

"The very brief literature review provided does not seem detailed or comprehensive enough to support the report's recommendations."

- In fact, the developers of the 750-page NY guideline examined 8208 abstracts and, from those, 744 original research articles.

- Behavioural interventions strongly recommended
  - [was that why ignored?]

International commentators

- “It appears that the intent (at least in Part 3) is to discourage rather than promote evidence-based practice.”

- “I can tell you now that they [the NZ Guidelines] do not bear a resemblance to any bona fide evidence-based practice guidelines I've seen, so should not be represented as such.”

- “As someone who has been teaching behaviour analysis for over 20 years I did not recognise my science as portrayed in this document.”

PART 5.4: BEHAVIOURAL, EMOTIONAL AND MENTAL HEALTH DIFFICULTIES

- No educational or applied behavioural psychologists involved in review for this section either.

- Only 2 (from hundreds of) original research articles were examined

- Merely a few biased reviews by Positive Behaviour Support advocates

Nevertheless . . .

New Zealand Ministries of Health and Education. "Draft Evidence-Based Guideline for Autism Spectrum Disorder" (2006).

Became, with minor editing:

- New Zealand Autism Spectrum Disorder Guideline (2008).
  - Note: "evidence-based" erased

However, Ministry of Education requested . . .

Technical Review of Published Research on Applied Behaviour Analysis Interventions for People with Autism Spectrum Disorder

- 16 behaviour analysts in New Zealand and 1 from US

Mudford, O., Blampied, N., Phillips, K., Harper, D., Foster, M., Church, J., Hunt, M., Prochnow, J., Rose, D., Arnold-Saritepe, A., Peters, H., Lie, C., Jeffrey, K., Messick, E., Sumpter, C., McEwan, J., & Wilczynski, S. (2009). *Technical review of published research on applied behaviour analysis interventions for people with autism spectrum disorders: Auckland Uniservices Ltd*. Wellington, New Zealand: Ministry of Education.

Technical Review of Published Research on Applied Behaviour Analysis Interventions for People with Autism Spectrum Disorder

- Some educational psychology involved

Mudford, O., Blampied, N., Phillips, K., Harper, D., Foster, M., Church, J., Hunt, M., Prochnow, J., Rose, D., Arnold-Saritepe, A., Peters, H., Lie, C., Jeffrey, K., Messick, E., Sumpter, C., McEwan, J., & Wilczynski, S. (2009). *Technical review of published research on applied behaviour analysis interventions for people with autism spectrum disorders: Auckland Uniservices Ltd*. Wellington, New Zealand: Ministry of Education.

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Autism Spectrum Disorders

- DSMIV Pervasive developmental disorders
    - Not including Rett Syndrome or Child Disintegrative Disorder
- Autistic disorder + PDD (NOS) + “Asperger’s Disorder”
- More than 50% (maybe 70%?) with Intellectual Disabilities

ABA interest in ASD diagnosis and classification has been low

- ABA is concerned with individuals' behavioural deficits (e.g., academic skills) and excesses (e.g., challenging behaviours)

- Much less concerned with DSM-type diagnostic categories
  - Often autism diagnosis not considered or mentioned

- Which is not good for examining the question about ABA for ASD

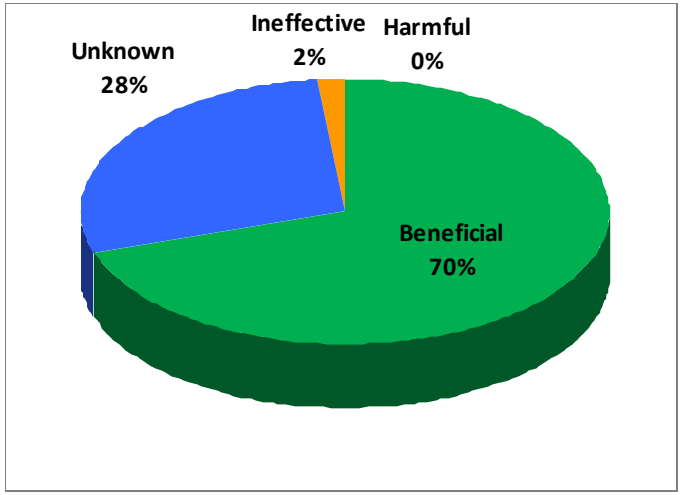
Review method

autis* or asperger* or pervasive developmental disorder* or PDD* or ASD*, 1998-2007, English language, human subjects, peer reviewed journals

- PsycInfo: 6783 hits
- Web of science: 9704 hits
- 378 ABA intervention articles reviewed after stringent exclusion criteria applied

Overall efficacy of behavioural treatment across all behavioural categories assessed (1998-2007; N=508)

Beneficial, ineffective, or harmful = unequivocally so from data
Unknown = outcome not clear-cut

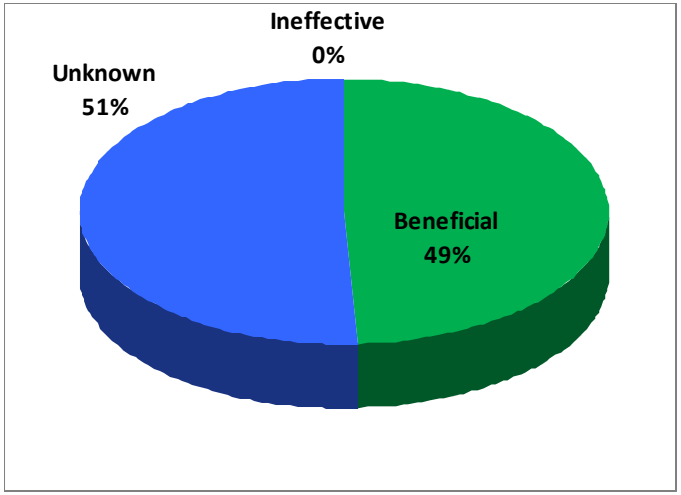


ABA for ASD review of classroom interventions

- Angela will review results

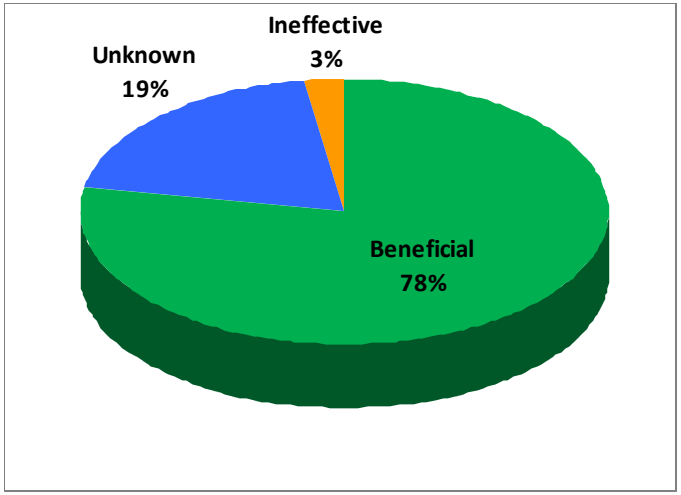
Comprehensive Interventions, i.e., early intensive behavioural interventions (1998-2007; N=112)

Sheree will review in some detail



Reducing challenging behaviours using non-punishment methods (1998-2007; N=75)

Oliver will review briefly



Parallel review by New Zealand Guidelines Group did not disagree

"This (NZGG) systematic review provides consistent evidence across a range of studies of reasonable quality that interventions based on the principles of ABA can produce beneficial outcomes in young children with ASD, and appear to hold more promise when compared to eclectic/standard care approaches."

National Standards Project (2009)

- Mainly US review of approximately 800 research articles to 2007
- ASD specifically
- Ages of research participants <22 years
- Not only ABA
- Included “interventions that can reasonably be implemented with integrity in most school or behavioural treatment programmes”
- Susan Wilczynski, PhD, chaired NSP
- Dozens of reviewers including 9 from NZ review team

NSP findings brief summary

11 Established efficacious interventions for schools

Including for:

Comprehensive behavioral treatment for young children (Sheree)

Educational interventions (Angela)

Challenging behaviour interventions (Oliver)

Early Intensive Behavioural Intervention

MoEd/MoH ASD Guideline Supplementary Recommendations re ABA (May 2010)

New: Early intensive behavioural intervention (EIBI) should be considered as a treatment of value for young children with ASD to improve outcomes such as cognitive ability, language skills, and adaptive behaviour.

New: Interventions based on the principles of ABA can be introduced before the diagnosis of ASD is confirmed in a child displaying some of the symptoms of ASD.

OUTLINE

- Define Early Intensive Behavioural Intervention (EIBI)
- Outline recommended features of EIBI
- Review some of the research

What is Early Intensive Intervention (EIBI)?

- Intensive Applied Behaviour Analysis Intervention/treatment for autism.

- It usually means 30 or more hours per week of one-to-one teaching for more than a year, usually beginning between 2-5 years (but older too)

Features Defining EIBI

1. Intervention is individualised and comprehensive, addressing all skill domains

2. Behaviour analytic procedures are used to increase new behaviour and decrease problem behaviours

   (e.g., differential reinforcement, prompting, discrete-trial instruction, incidental teaching, activity-embedded trials, task analysis, and others)

EIBI Features cont.

3. People with extensive training in ABA ***and*** experience and competence in working with children with ASD are involved leading the intervention

4. Normal childhood developmental sequences are used in the selection of intervention goals and short-term objectives.

5. Parents serve as active co-therapists for their children.

EIBI Features cont.

6. Intervention is delivered 1:1 initially, and gradually moves to small groups and then larger groups as and when appropriate

7. Intervention commences in the home setting and then systematically carries over to educational and other environments (once the child has the skills needed to learn in those environments)

EIBI Features cont.

8. Intervention is intensive, year round, 20-30 hours per week

9. Begins in the pre-school years when the child is 3-4 years old

What EIBI is not……

- EIBI does not equal discrete trial training
- EIBI is not rigid
- EIBI does not make children into robots
- EIBI does not focus on aversives
- EIBI does not insist that every child be the same
- EIBI does not stifle creativity
- EIBI does not neglect the relationship between child and therapist

The Science (evidence)

- Almost every treatment has someone who says it produces improvements

- Science is the only method for separating what works from what doesn't

  - Expert opinion is not enough
  - Building a bridge, building the space shuttle, etc., do not depend on opinion, they depend on hundreds of years of science

The evidence

- Let’s look at the research
- Let’s look at the measures that moved into the average range after treatment
- We will review controlled studies, which included ABA treatment groups and control groups which received no treatment or eclectic treatment.
- Also parent directed vs clinician directed

Journal of Consulting and Clinical Psychology
1987, Vol. 55, No. 1, 3-9

0022-006X/87/$00.75

Behavioral Treatment and Normal Educational and Intellectual Functioning in Young Autistic Children

O. Ivar Lovaas
University of California, Los Angeles

Evaluated 3 groups of children with ASD who were under 4 at intake
One group had intensive ABA (40 hours)
Second group had less intensive ABA (10 hours)
Third had no ABA

Post treatment those in the ABA (40 hours) scored 22-31 points high in IQ and adaptive measures

- **IQ and educational placement: 9/19 = 47%**

Published in: *Research in Developmental Disabilities*, *26*, 359-383 (2005)

A comparison of intensive behavior analytic and eclectic treatments for young children with autism

Jane S. Howard
California State University, Stanislaus and The Kendall School

Coleen R. Sparkman
The Kendall School

Howard G. Cohen
Valley Mountain Regional Center

Gina Green
University of North Texas and San Diego State University

Harold Stanislaw
California State University, Stanislaus

3 treatment approaches compared over 14 months.
EIBI, Eclectic in public special education classes and
Public non-intensive early intervention programs .

- **IQ: 13/29 = 44% (EIBI group). The EIBI group outperformed comparable children on virtually every measure**

DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS
Vol. 27, No. 2, April 2006

Printed in U.S.A.

Treatment

Early Intensive Behavioral Treatment: Replication of the UCLA Model in a Community Setting

HOWARD COHEN, PH.D.
Valley Mountain Regional Center, Stockton, CA
MILA AMERINE-DICKENS, M.S.
Central Valley Autism Project, Modesto, CA
TRISTRAM SMITH, PH.D.
Department of Pediatrics, University of Rochester Medical Center, Rochester, NY

Undertaken in a community setting
3 year study comparing EIBI with special education in public schools.
21 in each group

IQ: 12/21 = 57%
School placement: 6/21 = 28%
Language comprehension: 8/21 = 38%
Expressive language: 9/21 = 42%
VABS composite: 8/21 = 38%

Journal of Autism and Developmental Disorders, Vol. 28, No. 1, 1998

Home-Based Behavioral Treatment of Young Children with Autism

Stephen J. Sheinkopf[1,3] and Bryna Siegel[2]

- Treatment was home-based and was implemented by parents wit the assistance of home-based community clinicians.

- Differed from other studies in that it was outside an academic setting and was a shorter interval.

- Compared to a group that had conventional school based intervention

- Children receiving behavioural treatment had significantly higher post treatment IQ scores.

Behavior Modification
Volume 31 Number 3
May 2007 264-278
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10.1177/0145445506291396
http://bmo.sagepub.com
hosted at
http://online.sagepub.com

Outcome for Children With Autism Who Began Intensive Behavioral Treatment Between Ages 4 and 7

A Comparison Controlled Study

Svein Eikeseth
Akershus University College, Norway

Mean age of children was 5.5
Behavioural treatment was compared to eclectic treatment
Treatment took place in kindergartens and school settings

IQ: 7/13 = 54%
Aechenbach CBC: 4/13 = 31%

Available online at www.sciencedirect.com
ScienceDirect
ELSEVIER
Research in Autism Spectrum Disorders 1 (2007) 304–317
Research in Autism Spectrum Disorders
http://ees.elsevier.com/RASD/default.asp

Change in autism core symptoms with intervention

Ditza A. Zachor [a,c], Esther Ben-Itzchak [b,c,*], Ana-Lia Rabinovich [c], Eli Lahat [a]

Compared Eclectic treatment to ABA.
19 in the ED group
20 in the ABA group

ABA group showed significantly greater gains than the ED group following treatment

- **ADOS: 4/19 = 21%**

VOLUME 110, NUMBER 6: 417–438 | NOVEMBER 2005 AMERICAN JOURNAL ON MENTAL RETARDATION

Intensive Behavioral Treatment for Children With Autism: Four-Year Outcome and Predictors

Glen O. Sallows and Tamlynn D. Graupner
Wisconsin Early Autism Project (Madison)

24 children randomly assigned to a clinic-directed group or a parent-directed group

(with well-trained supervisors) .

IQ: 11/23 = 48%
School placement: 8/23 = 34%
Woodcock Johnson: 9/23 = 39%
Personality Inventory for Children: 9/23 = 39%
VABS Communication: 9/21 = 42%
VABS Social: 9/21 = 42%
ADI-R: 8/23 = 34%

Summary on EIBI research

- EVERY controlled study of ABA done for more than 25 hours per week and for more than 1 year results in some percentage of children achieving some scores in the average range

- Replication across three continents: North America, Europe, and the Middle East

- Conducted in both clinical and community settings (outside university settings)

What does the research tell us?

- Shows that EIBI produces the best results when compare with
  - Eclectic treatments
  - Typical educational treatments

Need for pilot program in various settings across NZ ?

MOE/MOH role?

What can educators do on a daily basis to help children in their educational settings?

- Contrive opportunities for requesting

  - give nothing for free!

- Increase compliance in an errorless way

  - Contrive opportunities for compliance. Give instruction and praise

Applications for school aged children

MoEd/MoH ASD Guideline Supplementary Recommendations re ABA (May 2010)

New: Interventions and strategies based on applied behaviour analysis (ABA) principles should be considered for all children with ASD.

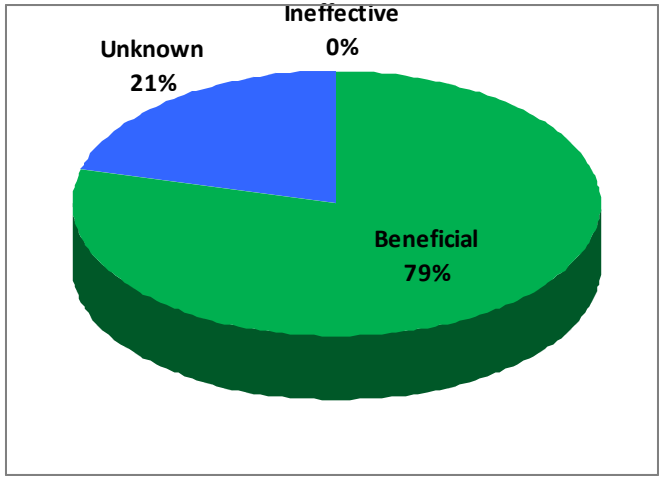
. . . there was little or no New Zealand-based research showing the appropriateness of ABA to the New Zealand context and population.

There is a lack of knowledge about the suitability of ABA for persons with an Asperger Syndrome diagnosis, and for participants aged 15 years or above.

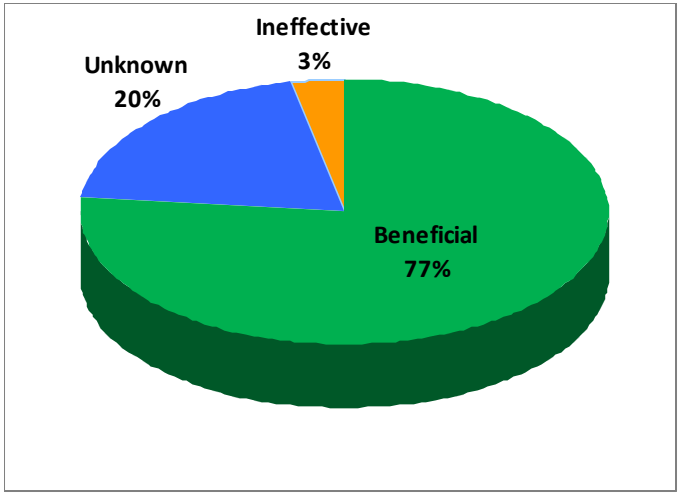
What can behavioural treatments do for children with autism?

- Further results from NZ ABA for ASD review

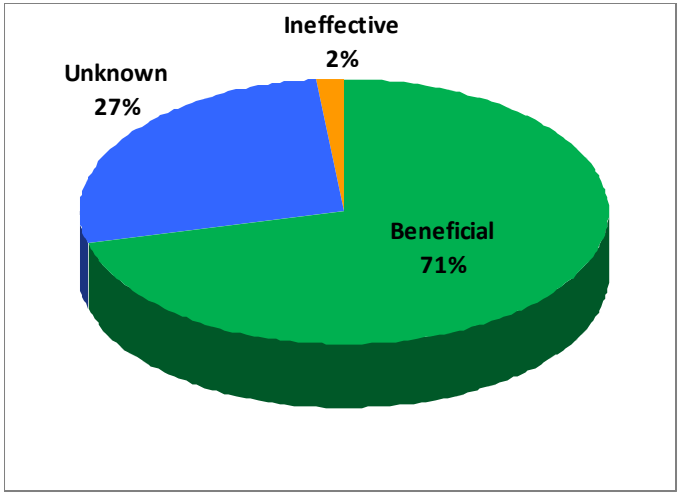
Social Development (1998-2007; N=85)



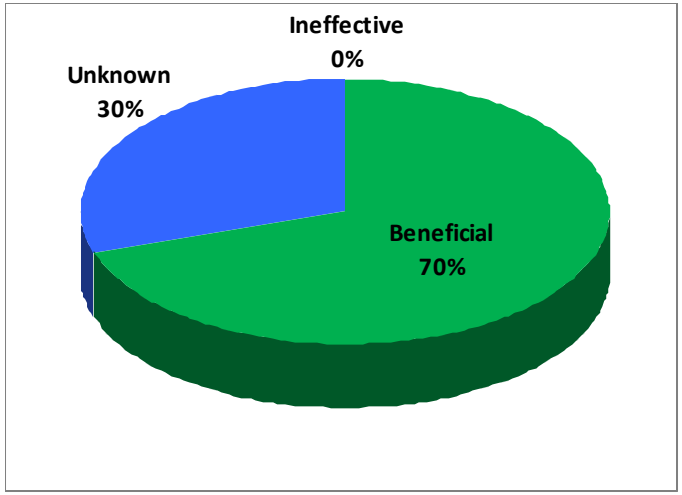
Cognitive Development (1998-2007; N=30)



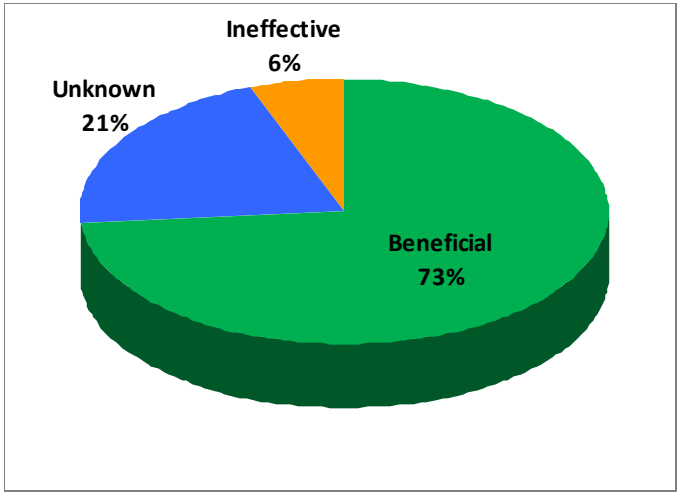
Communication (1998-2007; N=123)



Play / Vocation Engagement (1998-2007, N=40)



Independent Organisation (1998-2007; N=35)



National Standards Project

- Evidence-Based Practice and Autism in the Schools: a guide to providing appropriate interventions to students with autism spectrum disorders (National Autism Center, 2009)
- Lists eleven established treatments
- Majority from ABA*
- Most of the evidence for the remainder is from behavioral research

Eleven established treatments

- Antecedent Package*
  - Modify environment before target behaviour occurs
- Behavioural Package*
  - Functional analysis and plan development
- Comprehensive Behavioural Treatment for Young Children*
  - Early intensive behaviour intervention
- Joint Attention Intervention
  - Teaching learner to focus on items and at the same time as an other

- Modelling*
  - Showing
- Naturalistic Teaching Strategies*
  - Embed teaching in natural environment
- Peer Training Package*
  - Using peers as models
- Pivotal Response Treatment*
  - Target pivotal skills, e.g., self initiation

- Schedules*
  - To provide predictability
- Self-management*
  - Promoting independence in tasks that have been adult led
- Story-based Intervention Package
  - Written materials to increase independence

ANTECEDENT PACKAGE

Antecedent package

- Modify environment ahead of time to increase learning and reduce likelihood of problem behaviours
- Effective for children 3-18 years-of-age
- Effective with
  - Communication skills
  - Interpersonal (or social) skills
  - Learning readiness
  - Personal responsibility (e.g., daily living
  - skills)
  - Play skills
  - Self-regulation
  - Problem behaviours
  - Sensory and emotional regulation

- Often cost effective and requires minimal time
- Can be used alone or with other interventions (e.g., behavioural package)

How?

- Requires observation of student
- Implement before problem happens
- Includes (though not limited to)
  - Giving choice of activities or choice or activity order
  - Cueing and prompting strategies
  - Non contingent reinforcement
  - High probability sequencing

Example
Increasing compliance with high-p instruction sequences

- Identify instructions that are highly likely to be complied with (high-p)
- Identify reinforcers
- Deliver three high-p instructions, one approx every 10 seconds or less
- Compliance to each instruction followed by reinforcer
- Deliver one low-p instruction

MODELLING

Modelling

- Children (and adults) learn a lot by watching others.
- Effective for children 3-18 years-of-age
- Effective with
  - Communication skills
  - Higher cognitive functioning
  - Interpersonal skills
  - Personal responsibility
  - Play skills
  - Problem behaviours
  - Sensory and emotional regulation
- Won't be effective for children without generalised imitation skills
- Needs to be programmed for – can't assume it will happen

How?

- Live
  - Teacher
  - Peers
  - Children more likely to imitate; those similar to themselves, are competent, have prestige
- Video
  - Can be adult, peers or self
  - Self requires editing of video so it looks like student doing it for themselves.

Example
Teaching conversation skills with video modelling

- Identify target behaviours, e.g., initiation, turn taking
- Construct videos of peers engaged in sample conversations
- Child views video
- Immediately after viewing practises with teacher, or other adult
- When mastered introduce peers and other conversations

SELF MANAGEMENT

Self Management

- Effective for children 3-18 years-of-age
- Favourable outcomes for children with ASD
- Effective for
  - Academic skills
  - Interpersonal skills
  - Self-regulation

- Facilitates independence
- Increases learner’s awareness
- Direct and immediate self feedback
- Needs to be planned for

How?

- Teach self recording
  - Define a measurable behaviour
  - Select an appropriate method of recording; check sheets, wrist counters, completed work sheets
  - Instruct student how to record
  - Monitor data recording procedure
  - Allow student to self monitor, while monitoring results

- Teach self evaluation
  - Easiest way to set a goal student can readily identify
- Teach self reinforcement
  - In the class teachers usually arrange contingencies
  - Consider if….. then contingencies

Example
Retrieving lunch box from bag

- Create a photo album of each step in the task
  - Walking to bag area
  - Locating bag
  - And so on…….
- The last photo is a reinforcer (e.g., marshmallow in lunch box)
- Teach by shadowing student in completing the task

Function-based Interventions for Problem Behaviours

MoEd/MoH ASD Guideline Supplementary Recommendations re ABA (May 2010)

Revised: Behaviour management techniques [i.e., ABA] should be used to intervene with problem behaviours following functional behaviour assessment.

Functions of Behaviours

What is the function of a behaviour?

Is the same as asking:

What reinforcer is maintaining a behaviour?

Reinforcers are

External or internal

i.e., socially mediated or not

&

Positive or negative

i.e., gets something or something removed

In educational settings

Problem behaviours are most likely to be described as disruptive, aggressive, or destructive.

Socially mediated positive & negative reinforcers most likely

Socially mediated positive reinforcers Examples:

Getting attention from parent, teacher, peer

e.g., praise, telling off, eye-contact, physical contact

Obtaining tangibles from parent, teacher, peer

e.g., toys, other objects, edibles

Accessing preferred activities from parent, teacher

e.g., videos, games, reading time, playtime

Socially mediated negative reinforcers Examples:

Stopping attention from parent, teacher, peer

e.g., “Leave me alone”

Stopping demands from parent, teacher

i.e., “Give me a break”

Avoiding or escaping less preferred activities

e.g., “I hate reading”, “This is too difficult”

How do we discover reinforcers . . .

. . . maintaining a particular individual's particular problem behaviour?

Process is called functional [behavioural] assessment.

Usually only few clues from type/form/appearance of problem behaviour

Functional [behavioural] assessment: Methods

Aim is to discover relevant environmental antecedents and consequences.

Usual sequence follows, but assess no more than necessary

Developing hypotheses:

- Questionnaires
- Interviews
- Informal observations

Measure Behaviour + Antecedents + Consequences

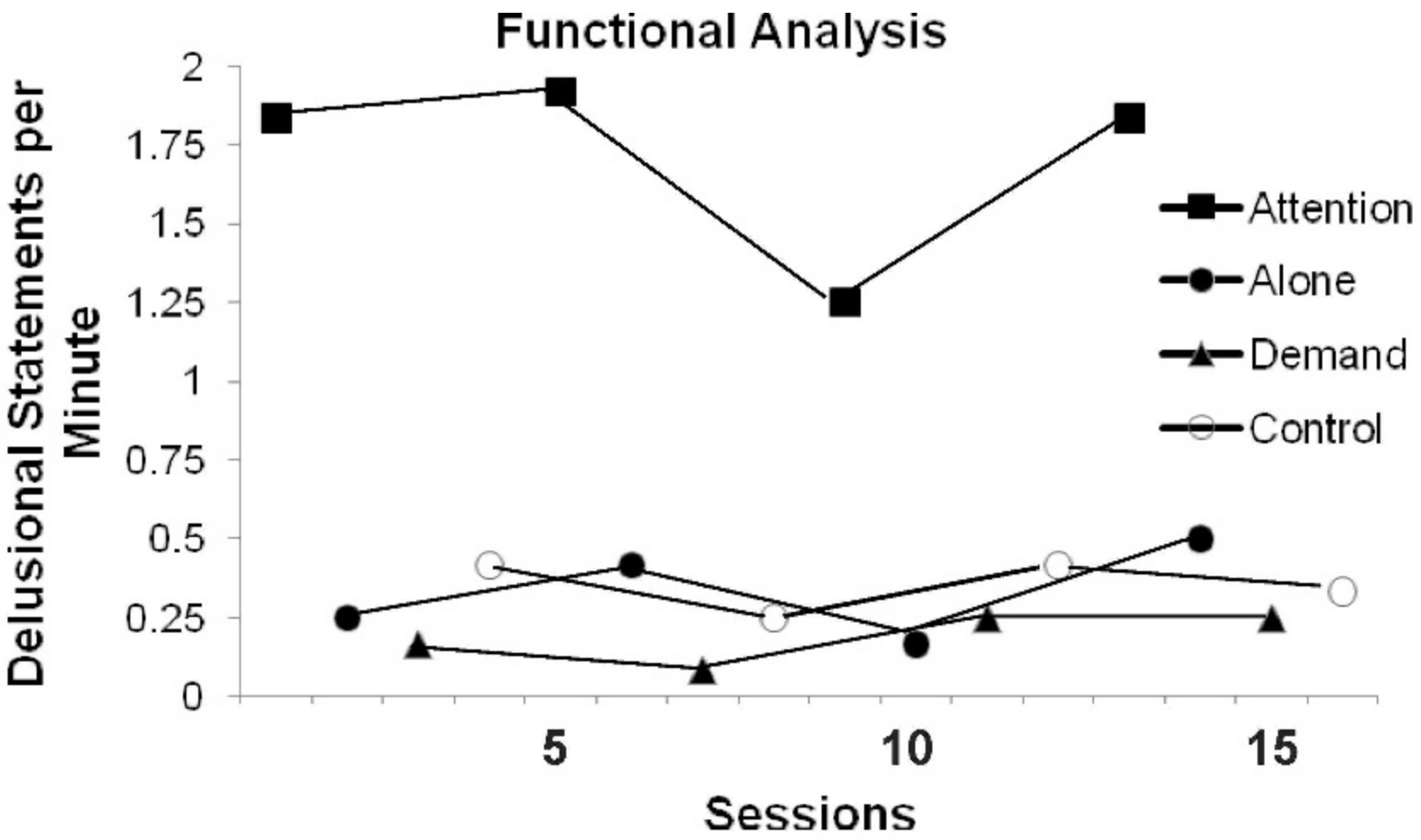
- Formal observations (e.g., ABC recording)
- Descriptive analysis

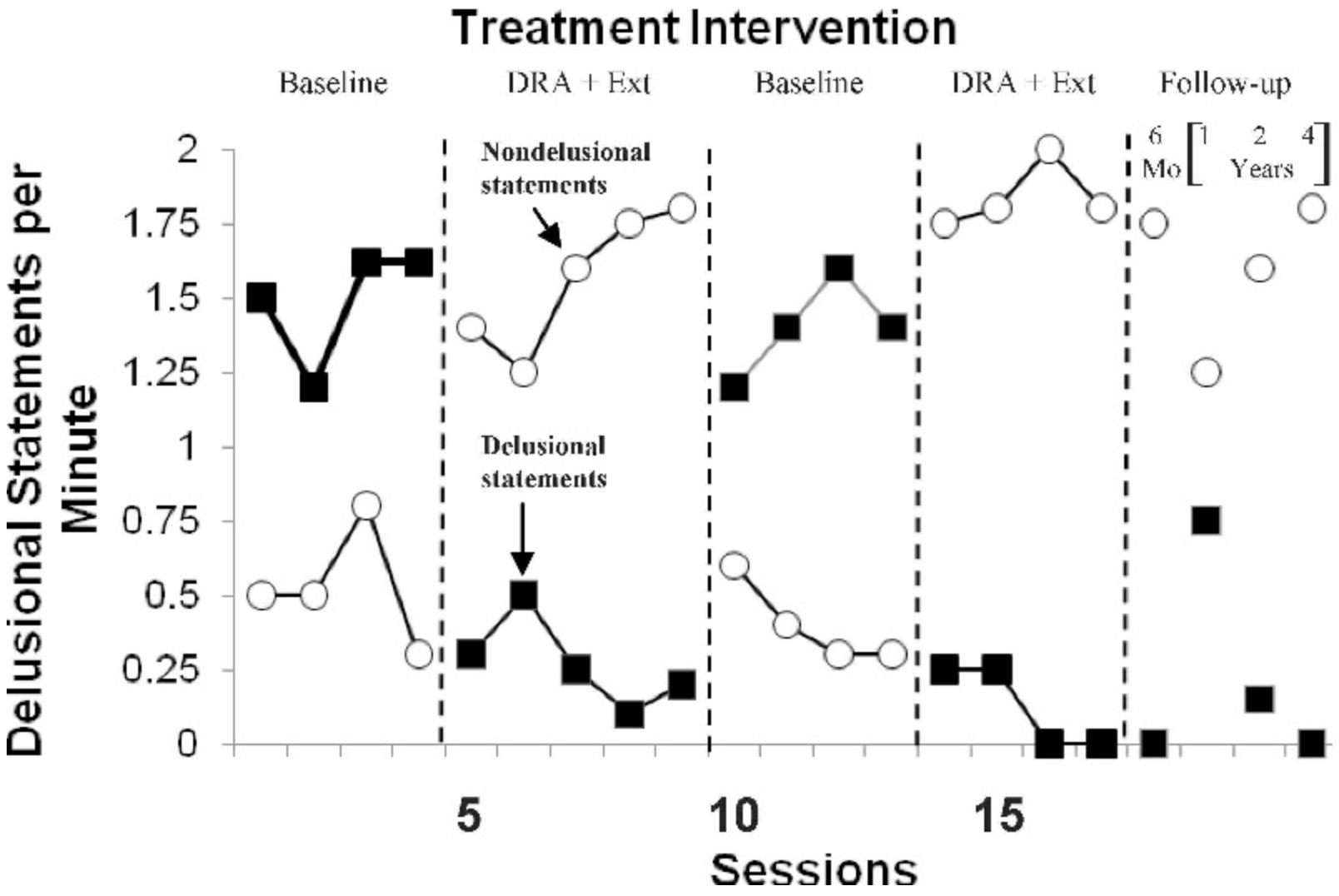
Testing hypotheses

Measure Behaviour while altering hypothesised maintaining Antecedents &/or Consequences

- Structural analysis: systematically change antecedents
- Functional analysis: systematically change antecedents & consequences
- Results of intervention based on function identified

Example: from Travis & Sturmey (2010)




Treatment Intervention
Baseline
DRA + Ext
Baseline
DRA + Ext
Follow-up
6 Mo
1 2 4 Years
Nondelusional statements
Delusional statements
Delusional Statements per Minute
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
5
10
15
Sessions

Two skills everyone should use systematically

"Catch the child being good"

(aka differential reinforcement)

"3-step prompting"

Tell – verbal prompt

Show – model prompt

Help – physical prompt

To teach new skills and compliance

Summary and Directions

ABA contribution to evidence-based educational psychology practice

- Early intervention
- Teaching methods
- Reducing disruptive challenging behaviours

- We have concentrated on ASD. ID, less so. Children in general, not at all.

- However, plenty of relevance across all areas

So, Sheree, what about EIBI for children with (or at risk of) ASD?

- That's >1% of children
- Recommended by MoEd/MoH ASD Guideline
- What if parents or professional "consider it as a treatment of value for a young child with ASD to improve outcomes for that child"?
- What if they want it?
- MoEd does not provide or fund it
- Private provision is all

MoEd/MoH ASD Guideline Supplementary Recommendations re ABA (May 2010)

Another recommendation:

> "Consumers of applied behaviour analysis interventions should refer to recently published guidelines for identifying, selecting and evaluating behaviour analyst services for people with ASD."

- Most EIBI businesses do not meet any guidelines for quality
- Families being exploited
- ABA gets a bad name

Angela, to what extent are evidence-based teaching methods employed in schools?

- Methods derived from ABA research are known and acknowledged by MoEd in ASD Guideline but . . .

- Are they used?

Oliver, are evidence-based methods used to reduce problem behaviours?

- I don’t know.

- Audience: are they?

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