What is “ABA”, and how can ABA approaches benefit children with autism and children with a learning disability?
Today’s presentation

1. What is Applied Behaviour(al) Analysis?
2. What are Autism and Learning Disability?
3. Evidence for ABA approaches
4. Comprehensive ABA educational models for children
   • Evaluation of the Westwood school ABA class: Keystage 1 comprehensive ABA-based education in a mainstream setting
   • Delivering a comprehensive ABA-based model in mainstream pre-school settings in Norway: A controlled comparison with “typical special education”
   • Low intensity ABA intervention for young children with LD in mainstream pre-schools
What is ABA?
ABA and the science of learning

• ABA has evolved from a science of learning (called behaviour analysis)
• Behaviour analysis is often presented using technical jargon
• What is ‘behaviour’?
  – “Human behaviour is what people do”
  – “language (what people think, say, and remember) is behaviour”
  – Emotional responses are behaviour
  – To study behaviour, we have to be able to measure it
  – “Behaviour” is not a shorthand for problem behaviours
ABA and behaviour change

- ABA = positive behaviour change for individuals, groups of people, for organizations and society
- Using scientifically derived learning principles and ABA-based intervention approaches
- Principles or laws of learning are central to any behaviour change – whenever we change behaviour we tap into these principles
- ABA helps people achieve their full potential by changing the environment around them and helping them build skills
NICE behavioural intervention

- **Borderline personality disorder** (Jan 2009) - Dialectical Behaviour Therapy
- **Depression** in adults (Oct 2009) - Behavioural Activation
- **Obesity** (Dec 2006) - multi-component intervention including behaviour change, goal setting
- **Parent training/education for child conduct disorder** (July 2006) - behavioural parent training
- **Dementia** (Nov 2006) - “behavioural and functional analysis” for challenging behaviours
For adults with autism of all ranges of intellectual ability, who need help with activities of daily living, consider a structured and predictable programme based on **behavioural** principles (1.4.6)
Definition of ABA

“ABA is a values-driven, person-centred, developmentally-informed, evidenced-based, effective use of principles of learning to help people achieve their full potential.”
Values/commitments of ABA

- **ambition** for the person, and optimism about what is possible for them
- an assumption of every person’s ability to learn (not dis-ability)
- empowering the individual by establishing skills and supporting management of their own behaviour
- collaborative working with other professionals, family members, and carers to best support the individual
Deciding what to change

1. People themselves, their families, and others identify what outcomes are important to them
2. An understanding of typical development, statutory educational curriculum
3. Focus on *Pivotal behaviours* that will facilitate further development: teaching communication, social skills, daily living or academic skills that can support independence and choice-making
Summary - What is ABA?

• A scientific approach to understanding behaviour based on psychological learning theory (40+ years of research)

• Aims to understand current behaviour in terms of:
  – Genetic factors and personal history
  – **The current environment**

• Aims to develop more effective behaviour by
  – Analysing how current behaviour is affected by its environmental context
  – Teaching new patterns of behaviour using reward-based learning methods -- making learning fun!
  – Where new patterns of behaviour are complex, breaking them down into small, easily taught steps
  – Careful monitoring, evaluation and improvement of all teaching efforts
What are Autism and Learning Disability, and why should we be interested in working with these children?
Autism

- A life-long developmental disability
- Difficulties in communication, social interaction, and social imagination
- Repetitive behaviours, insistence on routine and restricted interests

- Prevalence of Autism Spectrum Disorders in children in the UK roughly 1 in 100
- Population-based estimates suggest 52% of children with autism also have an intellectual disability
Learning Disability (*Mencap*)

- A learning disability is a reduced intellectual ability and difficulty with everyday activities – for example household tasks, socialising or managing money – which affects someone for their whole life.
- People with a LD tend to take longer to learn and may need support to develop new skills, understand complex information and interact with other people.
- The level of support someone needs depends on individual factors, including the severity of their LD. Someone with a mild LD may only need support with things like getting a job. However, someone with a severe or profound LD may need full-time care and support with every aspect of their life – they may also have physical disabilities.
Learning Disability II

• People with certain specific conditions can have a learning disability too. For example, people with Down’s syndrome and some people with autism have a learning disability

• Learning disability is often confused with dyslexia and mental health problems. Mencap describes dyslexia as a “learning difficulty” because, unlike learning disability, it does not affect intellect. Mental health problems can affect anyone at any time and may be overcome with treatment, which is not true of learning disability

• It’s important to remember that with the right support, most people with a learning disability in the UK can lead independent lives
Context: Economic cost of Autism

- Total cost per year to UK economy of £27.7 billion [Knapp et al., 2007]
- Lifetime cost to UK economy of low functioning person with autism is estimated as £4.6 million (£3.1 million for high functioning person)
- Total costs in UK for children with ASD and ID, including direct services, loss of economic contribution from parents unable to fully engage in the workforce, but EXCLUDING informal care by families:
  - In residential or foster placements, average across childhood and adolescence (3-17 years) = £51,000 per annum
  - For a child living with their family = £30,000 per annum
Context: Psychological impact on family members

% Emotional disorder

% High Positive Mental Health
Evidence for ABA approaches in Autism and Learning Disability
The three strands of evidence

1. Single case experimental design studies - primarily from clinical and educational practice, designed to report how positive outcomes were achieved AND to develop evidence for technical procedures that can be replicated by others

2. Group design studies comparing specific ABA-based interventions for more focused outcomes with control or comparison groups

3. Evaluation of large scale models of service delivery in educational contexts
Single Case Experimental Designs

• PRACTICE-BASED EVIDENCE refers to the collection of ongoing evidence that a teaching method is leading to the desired outcomes

• DATA INFORMED DECISION-MAKING—self-correcting and accountable

• ABA practitioners continually come back to the question: “Is this working for this person?”
SCED example - Initiations to peers at break time
Picture Exchange Communication System evaluation research

[Howlin et al., 2007]

• 18 classes of children (N= 84) with autism allocated randomly to PECS or education as usual
• 2 days PECS workshops for teachers and parents
• PECS trainers then made 6 half-day consultation visits to each class over 5 months
• Communication initiations and PECS use increased after training, but no changes in standardised language and other measures
• Effects did not maintain after support ended
Features of comprehensive ABA-based educational intervention

• Teaching multiple skill areas
• Teaching over a long period of time - years rather than weeks or months
• For all ages of children and adolescents
• Structure learning opportunities and incorporate “natural” opportunities across much of the day/week
• Involves a team of people (often including parents)
• Can take place at home or in school and other settings
• No prescription of intensity - can be comprehensive across school day, can be targeted
Outcomes for 309 children in IBI vs. 144 comparison group children
[Eldevik, Hastings, Hughes et al., 2010]
UK context - ABA schools census

[Griffith, Fletcher & Hastings, 2012]

- On 1 March 2010, 14 ABA schools/units/classes for children with autism in operation in the UK
- Total of 258 children (219 male, 39 female). Mean age when they started at the ABA school 7.1 years (SD = 3.3 years, range 3-17 years). Mean age of children on census date 10.8 years (SD = 3.8 years, range 3-18 years)
- 382 school staff supporting ABA teaching. Mean ratio for was 1.4 staff: 1 child (range 0.7:1 to 2:1)
Outcomes for children with autism receiving ABA intervention in a mainstream school environment

Westwood ABA class

- The Applied Behaviour Analysis (ABA) class at Westwood school was a Key Stage 1 (4-7 years) provision for up to 10 children with autism [Grindle et al., 2009]
- The educational model involved collaboration between the school, two local education authorities, Bangor University
- Total in-school instruction for 30 hours a week for 38 weeks of the year
- In addition, play scheme (1-2 weeks in summer) and home visits offered to all children
- ABA resource structured and organized to approximate typical classrooms in the mainstream school (e.g., décor and environment, timetables, extra curricular activities)
- Mainstream integration targets for all children
ABA class team

Consultant Behaviour Analyst BCBA-D

ABA Supervisor

Key Worker

Teacher in charge

Tutor

Tutor

Tutor

Tutor

Tutor

Outcome evaluation

- Children (9 male, 2 female) entered ABA class at nursery age (N=3), reception (N=5) or Year 1 (N=3) [intake age 43 - 68 months (Mean = 58.2 months)]

- Baseline taken within first few weeks of entry; measures repeated annually (11 children at one year, 9 over two years)

- Testing by individuals independent of ABA delivery

- IQ assessments (Bayley Scales, Stanford Binet, occasional use of Leiter), and Vineland Adaptive Behavior Scales
SCAmP comparison group

- 18 children constituting the “education as usual” comparison group in Remington, Hastings et al., (2007) - *Southampton Childhood Autism Programme* (SCAmP) evaluation
- Children assessed just before entering full time school (as two year outcomes evaluation point against IBI children) at mean age 63.89 months
- Re-assessed 24 months later [Kovshoff, Hastings & Remington, 2011]
- Statistical analysis - one way ANCOVA comparing outcomes after TWO years, controlling for baseline/“intake” score
Adjusted two year means
## Effect sizes after two years

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Behavioral intervention for children with autism in local mainstream pre-school settings

ABA service delivery model in Oslo pre-schools

• Typical staff:child ratio in pre-school 1:3-1:6 depending on age of children

• Typical funding: one additional full-time staff member and supervision and training from a special education teacher and/or speech and language therapist employed by the education departments for 3-8 hours per week

• ABA model uses same staff resources

• Pre-school staff responsible for the day-to-day running of the behavioural intervention program with supervision and training through a Centre
Oslo behavioural intervention

\[ n = 31 \]

- Approx. 14 hours per week
  - 1:1/DTT (to teach new, more difficult targets)
  - Small groups (play, games)
  - Pre-school unit (with other children - focus on eating, dressing, singing, toileting etc.)

- Supervision and staff training
  - At least weekly visits from ABA supervisor (1-4 hrs)
  - 2-4 visits per year from consultant/psychologist (BCBA)
Oslo special education
[n = 12]

• Minimum 5 hours per week eclectic provision
  • Alternative communication (sign-language)
  • Sensory-motor training
  • Some ABA (specific skills: self-help, toileting etc.)
  • Teachers’ own experience

• Supervision and staff training
  – 1:1 hours with special education teacher
  – weekly training and supervision of pre-school staff
Change in IQ over two years

[Effect size $d = 1.03$]
Change in VABS composite

[Effect size $d = .73$]
Cognitive and adaptive behavior outcomes of behavioral intervention for young children with intellectual disability

Sigmund Eldevik, Erik Jahr, Svein Eikeseth, Richard Hastings, Carl Hughes (2010). *Behavior Modification*
Behavioural Intervention for children with LD

All children in mainstream pre-school settings

• 11 children with LD and no autism, 2-6 years of age
  – 8-15 hours (on average 10 hrs) per week of ABA
  – For between 5 and 22 months (on average 12 mo.)

• 14 children received eclectic special education support
  – For 12-21 months (15 months on average)
  – Some ABA but for specific skills/problems only and for 2-5 hours per week for 3-4 months typically
IQ outcomes

[Effect size $d = 1.13$]
Adaptive behaviour outcomes
[Effect size $d = .95$]
Conclusions

• ABA is often thought of as an intervention for autism, but it is much more than that
• Interventions incorporating ABA methods are used, and NICE-recommended, throughout health and social care
• Most large scale ABA research in autism and LD is about building service models incorporating evidence based practices
• When compared with education as usual/eclectic practice, better outcomes are achieved using ABA models
• Using the same resources for ABA as are invested in special education, or using high quality but low intensity models, can lead to better outcomes for children
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