



Multidisciplinary Teamwork in Autism: Can One Size Fit All?

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**Multidisciplinary teamwork in Autism:
Can one size fit all?**

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Karola Dillenburger, Clinical Psychologist & BCBA-D (1)
Hanns-Rüdiger Röttgers, Psychiatrist (2)
Katerina Dounavi, Psychologist (Greece) & BCBA-D (1)
Coleen Sparkman, Speech and Language Pathologist (3)
Mickey Keenan, Psychologist & BCBA-D (4)
Bruce Thyer, Social Worker & BCBA-D (5)
Christos Nikopolous, Occupational Therapist & BCBA-D (6)

- 1- School of Education, Queen's University Belfast, Northern Ireland
- 2- School of Social Sciences, University of Applied Science, Münster, Germany
- 3- Kendall School & Therapeutic Pathways, Inc., Modesto, USA;
- 4- School of Psychology, University of Ulster, Northern Ireland
- 5- School of Social Work, Florida State University, USA
- 6- School of Health Sciences and Social Care, Brunel University, London, UK

Correspondence should be addressed to k.dillenburger@qub.ac.uk

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Abstract

Multidisciplinary practice has become an accepted approach in many education and social and health care fields. In fact, the right to a multidisciplinary assessment is enshrined in the United Nations Convention of the Rights for Persons with Disabilities. In order to avert a ‘one size fits all’ response to particularly heterogeneous diagnoses, such as autism spectrum disorders (ASD), the National Institute for Clinical Excellence (NICE) recommends multidisciplinary input. Yet, multidisciplinary lacks empirical evidence of effectiveness, is fraught with conceptual difficulties and methodological incompatibilities, and therefore there is a danger of resorting to an ill-defined eclectic ‘hodgepodge’ of interventions.

Virtually all evidence-based interventions in autism and intellectual disabilities are behaviourally based. Not surprisingly therefore, professionals trained in behaviour analysis to international standards are increasingly becoming key personnel in multidisciplinary teams. In fact, professionals from a range of disciplines seek training in behaviour analysis.

In this paper we brought together a multidisciplinary group of professionals from education, health, and social care most of whom have a dual qualification, in a allied health, social care, or educational profession as well as in behaviour analysis. Together we look at the initial training in these professions and explore how behaviour analysis can offer a common and coherent conceptual framework for true multidisciplinary, based on sound scientific knowledge about behaviour without resort to reifying theories. We illustrate how this unifying approach can enhance evidence-based multidisciplinary practice to that ‘one size’ will fit all.

Keywords: autism, applied behaviour analysis, multidisciplinary teamwork

Multidisciplinary teamwork in Autism: Can one size fit all?

Multidisciplinary work, where members of a range of professions contribute knowledge and skills in a team effort to benefit the service user, is viewed as the cornerstone for collaboration, clinical judgment and decision-making in many education, health, and social care contexts. Multidisciplinary collaboration is demanded by the United Nations Convention for the Rights of Persons with Disabilities (CRPD, 2007) and adopted by, for example, the NICE (2013) guidelines for the management of autism in children and young people, with the expectation that the 'whole is greater than the sum of its parts' (Bond & Eldridge, 2012, p.403).

Multidisciplinary teams commonly consist of educational, medical, allied health, and social care professionals. Specializations are important because it is humanly impossible for one person to be fully trained in all necessary competences. Within each discipline there are further specializations, for example, educators usually specialize in primary, secondary, special, or lifelong education. In medicine, practitioners can specialize in surgery, general practice, anaesthetics, cardiology, or orthopedics. Similar differentiations occur in other professions, for example, social workers may specialize in family and childcare, elder care, criminal justice, or mental health, while nurses may specialize in critical care, midwifery, health visiting, or psychiatric nursing. Together they represent specific areas of expertise with the aim that those in need of services benefit from a comprehensive understanding that combines knowledge areas and extends beyond rigid professional boundaries.

Although a multidisciplinary approach seems entirely reasonable, even common sense, virtually all interventions that are established as effective in the treatment of autism and other neurodevelopmental disorders, are based on the application of behaviour analysis, i.e., Applied Behaviour Analysis (ABA) (NAC, 2009). As well as improving overall quality of life, academic and social skills, numerous cost-benefit analyses show the fiscal advantages of behaviour analysis based interventions, especially but not exclusively, when applied early in life (e.g., Chasson et al., 2007; Jacobson et al., 1998; Motiwala et al., 2006). Not surprisingly, ABA-based interventions are widely endorsed in the USA and Canada, e.g., see Surgeon General (1999) and the Office of Personnel Management (2012), and are covered by public and private health care systems (Associated Press, 2014). Board Certified Behavior Analysts (BCBA) are the key professionals to supervise these programmes and in some cases funding is denied if a BCBA is not in charge of the service user's programme.

In other parts of the world, people not trained in the discipline of behaviour analysis frequently caricature ABA as a 'one size fits all' model without reference to the science on which it is based (Howlin, 2013; Maginnis, 2008). Subsequently, ABA-based interventions have been rejected in favour of eclecticism in autism treatment (e.g., Howlin, 2010; Jordan, 2005;). Eclecticism, however, remains an ill-defined terra incognita, especially due to the potential for conceptual and methodological incompatibilities and the sheer impossibility of all-embracing staff training (Dillenburger, 2011). Odom et al. (2012) also critiqued eclecticism because of a severe 'lack of clarity as to the actual components of the treatment conditions [that] makes replication of intervention procedures highly improbable' (p.282). In fact, there is evidence of comparative ineffectiveness of eclectic interventions when compared with ABA-based interventions (Howard et al. 2005). Not surprisingly, eclecticism has become a

highly contentious and controversial concept, especially with regard to autism spectrum disorders (ASD) interventions (Freeman, 2003).

Without a common conceptual foundation there is a danger that multidisciplinary regresses into mere eclecticism, or what Howley (2009) called, a 'haphazard "pick and mix" which fails both the child and the practitioner' (p.vii). Rhoten (2003) cautions that 'while there is a general acceptance of interdisciplinary collaboration as both a worthy and authentic component of "new" science and scientific research in theory, the idea remains largely misunderstood, misconstrued, and mismeasured in practice' (p.1). This can have many undesired side effects, such as being labour intensive, ineffective, and expensive; causing controversy, competition, and the potential for annulling treatment effects; lacking coherent theoretical foundations; or engendering professional jealousy, none of which benefits the service users. Consequently, Ernsperger (2002) warns:

Caution must be given for selecting an eclectic approach in order to prevent a "hodgepodge" of instructional methods with no clear understanding of the specific techniques and components. (p.60)

To confuse matters further, the recent availability of funding in the USA for ABA-based interventions for ASD has led to the assertion from a range of professionals, especially psychologists, that they are trained in behavioural principles and, ergo, competent in the delivery of ABA-based interventions (Crowder & Nordal, 2013). In order to prevent misrepresentation of ABA competence, State licensure laws identify Board Certified Behavior Analysts (BCBA) as appropriately qualified professionals, although unfortunately, these regulations are not yet available in most other parts of the world.

In this paper we bring together a multidisciplinary group of experts in their respective fields, most of us are also BCBA's. We address the question of how to square the circle between the importance of multidisciplinary input, disciplinary boundaries, competence in ABA, and consistency in terms of intervention strategies. We discuss how true multidisciplinary can be achieved without resort to eclecticism for the sake of it. We show how this can be done, by adopting the common understanding of human behaviour afforded by behaviour analysis (Cooper et al., 2007). We illustrate this with an example of a project based on holistic, multidisciplinary teamwork in the area of autism interventions.

Autism Spectrum Disorder

With regards to Autism Spectrum Disorder (ASD) there are no medical markers and the diagnosis is based on behavioural observations and caregiver reports of social/communication deficits, restricted interests and repetitive behaviours. Severity of ASD is assessed on three levels depending on service needs, i.e., Level 1: *Requiring Support*; Level 2: *Requiring Substantial Support*; Level 3: *Requiring Very Substantial Support* (DSM-5; American Psychiatric Association, 2013).

While it is possible to diagnose before the 2nd birthday, typically children are diagnosed at about 3 years of age, although oftentimes the diagnosis comes much later. Presently, internationally accepted prevalence estimates are based on the USA figures of 1:88, although school aged populations and boys show a much higher prevalence

rate of 1:54 (CDC, 2013). In Northern Ireland recent figures for school aged children are 1:56 (Community Information Branch, 2013). These figures confirm predictions that adult prevalence rates are likely to rise considerably in the future.

A diagnosis is reached after a number of assessments and observations using standardized measures, such as the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 1989) and the Autism Diagnostic Interview-Revised (ADI-R; Lord et al., 1994). Most diagnostic teams consist of a pediatrician, a clinical or educational psychologist, and a speech and language therapist or occupational therapist (Thyer & Kropf, 1995). Commonly, there has to be full agreement between all professionals, i.e., a unanimous decision is necessary for an ASD diagnosis to be confirmed.

When the diagnosis of ASD is confirmed in very young children, the decision as to what kind of intervention should be undertaken is initially left up to parents. When the child reaches compulsory school age, a multidisciplinary team may become involved in designing Special Educational Needs (SEN) Statements and Individual Education Plans (IEP). During the transition to adult services, again a multidisciplinary team is tasked to advise on the best way ahead.

Like most other diagnoses, support and services for individuals with ASD and their families can benefit from input from many areas of expertise. Unlike many other diagnoses, however, there often is limited agreement between professionals as to what constitutes the best way forward after diagnosis. One of the main reasons of this incongruity is that while multi- or interdisciplinary collaboration makes sense on paper, when it comes to the practicalities of working together, there is generally very little common ground. The caseworker, who is tasked with leading the team, needs to ensure that everyone is not simply 'doing their own thing'. The danger is that rather than using a common conceptual basis for their work, different professionals recommend different discipline-specific interventions in an eclectic mix. Of course, this problem does not only arise in autism interventions (McDaniel & Dillenburger, 2014), especially if some such interventions are provided at great expense to parents, using proprietary models with costly treatment manuals or training programmes (e.g., The Option Institute, 2014). Indeed, many interventions are promoted without any scientifically credible evidence of effectiveness and are pseudoscientific in their orientation (Offit, 2010; Thyer & Pignotti, 2010), creating a very confusing treatment landscape for parents, other caregivers, and policy-makers (Dillenburger, McKerr, & Jordan, 2014).

As mentioned earlier, out of this landscape has come the maxim that 'one size **does not** fit all' and an eclectic approach to treatment is recommended as necessary or better, not because it possesses the best scientific evidence for effectiveness, but because it seems the only way out of the dilemmas arising from differing perspectives held by different professionals (Odom et al. 2012). This state of affairs exists despite the evidence pointing out that an eclectic approach is not very effective compared to interventions derived from ABA (e.g., Howard et al., 2005).

Applied behaviour analysis

Behaviour analysis is the science of behaviour, where behaviour is defined as the interaction of a biological organism (in this case, a person) with their environment. In other words, behaviour is anything an organism does that is either publicly discernible, such as gross and fine motor movements, or privately observable, such as cognitions, emotions, or attitudes (Cooper et al., 2007).

The interface between biology and the environmental contingencies to which the person is exposed is assessed with respect to their learning history, their present circumstances, and their cultural context. By employing 'the scientific method' to delineate behavioural principles, explanations for behaviour are sought through an analysis of environmental contingencies. Mentalistic interpretations are avoided in favour of an analysis of functional relations between the organism and the environment (Keenan, 1997; Keenan & Dillenburger, 2012) with the result that, as Fryling (2013) put it 'behavior is almost always much more than the world considers it to be' (p. 48).

From this perspective, the understanding of how behaviour evolves across the lifespan of an individual has led to effective, individually tailored, truly child/person-centered interventions. These interventions rely on data-based decisions with respect to how environmental contingencies interact with the individual and the functions that these interactions serve. Behavioural data are collected and interventions tested by using within/intra-subject research designs to allow for immediate discontinuation of ineffective procedures (Johnston & Pennypacker, 2008). The procedures are adjusted if outcome data indicate a need for adjustment. When applied in this way, behaviour analysis is not limited to certain target behaviours, in fact, pretty much any behaviour can be targeted through the scientific analysis of behaviour (Dillenburger & Keenan, 2009). The key word, of course, is analysis!

Applied behaviour analysis (ABA) is widely recommended as the scientific basis for effective interventions in autism (NAC; 2009). For example, the Surgeon General of the United States endorsed behaviour analysis in his *Mental Health Report* as long ago as 1999:

Over 30 years of research demonstrate the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior. (p.164)

The Ontario Department of Education Policy/Program Memorandum (PPM-140, 2007) established a policy framework to

support incorporation of ABA methods into school boards' practices [and recognized that]. . .[t]he use of ABA instructional approaches may also be effective for students with other special education needs. (p. 1)

Since then, more recent endorsement have come from many others, including the U.S. Office of Personnel Management that manages benefits for all federal government employees. They specified that treatment of autism that is based on behaviour analysis merits insurance coverage for federal employees. Their review panel determined that

based on ample scientific and empirical evidence, ABA therapy qualifies as a medical treatment, rather than purely educational. (Bahsoun, 2012, p1)

Interventions based on ABA now are covered by health insurance in most states in the USA and, increasingly, licensure laws ensure that Board Certified Behavior Analysts (BCBA) plan, manage, and supervise implementation.

In sharp contrast to North America, in the rest of the world, ABA-based interventions commonly are sidelined as a ‘one size fits all’ approach (Dillenburger & Keenan, 2009). The main reason for this sad state of affairs lies in a common category error (Ryle, 1949) that is made in relation to ABA. Rather than being understood as a distinct discipline (Cooper et al., 2007), ABA is often considered one of many interventions in autism. Category errors are made when concepts that belong to one category are wrongly used as if they belong to another, for example, when kitchen, living room, bathroom, bedroom and house are all considered on the same level. In this case, ‘house’ belongs to a different, broader category than the others, i.e., ‘house’ belongs to an overarching category (Chiesa, 2006; Dillenburger & Keenan, 2009). The same mistake is made when people talk about Early Intensive Behavioural Intervention (EIBI), Lovaas Programme, Verbal Behaviour (VB), Picture Exchange Communication System (PECS), Pivotal Response Training, and ABA, as if they were all intervention methods per se. In this instance, ABA belongs to a different, broader category from which a great variety of procedures, including those mentioned, are developed. The most reliable way to ensure that category mistakes are avoided is by providing accurate definitions and appropriate training of professionals.

ABA is correctly defined as:

the science in which the principles of the analysis of behavior are applied systematically to improve socially significant behavior, and in which experimentation is used to identify the variables responsible for change in behavior. (Cooper *et al.*, 2007, p.20)

Multidisciplinary professionals

In order to understand how the science of behaviour analysis can enhance collaboration across different professional disciplines that share a common focus (i.e., improving the quality of life of their target population), it is important first to understand training requirements across relevant professions (Table 1).

Table 1: Training requirements for key professionals in ASD

Professional title	Additional requirements	Accreditation	Training level	Practice training	ASD training	ABA training
Board Certified assistant Behaviour Analyst (BCaBA)	BCaBA exam	BACB + NCCA	Undergraduate degree (180 hours)	1000 practice hours/elements (5% must be supervised)	Systems vary: No requirement; often strong focus on ASD	Comprehensive curriculum BACB Tasklist 4 th edition
Board Certified Behaviour Analyst (BCBA)	Specified Masters degree BCBA exam	BACB + NCCA	Postgraduate Masters degree (270 hours)	1500 practice hours/elements (5% must be supervised)	Systems vary: No requirement; often strong focus on ASD	Comprehensive curriculum BACB Tasklist 4 th edition
BCBA-D	BCBA + PhD	See above	BCBA + Doctoral	See above	See above	See above
Medical Practitioner	Specialisations:	Medical Council equivalent	Basic: 5+ years undergraduate training	At least 2 years foundation clinical practice	No requirement; NICE	Not covered

	General Practitioner, Pediatrician, etc.		Specialisations: 5 years Postgraduate training		guidelines	
Psychiatrist	Medical Practitioner	Medical Council equivalent		5 years clinical practice in all psychiatric conditions	Systems vary: diagnostics; Focus on comorbid conditions	Systems vary: No requirement Behaviour therapy
Allied Health Professional (UG)	Specialisations: Speech and Language Therapist, Occupational Therapist Physiotherapist	Health Care Professional Council (HCPC) equivalent	3 years undergraduate (UG)	Various (approx. 1 year)	Systems vary: No requirement	Systems vary: No requirement
Allied health Professional (PG)	Specialisations: Clinical Psychologist, Educational Psychologist	HCPC equivalent	Systems vary Usually 2-3 years postgraduate (PG);	Various (approx. 1-2 year)	Systems vary: No requirement Usually some basic cover	Systems vary: No requirement Behaviour therapy
Teacher	Specialisations: Primary Post-primary Special Education	General Teaching Council equivalent	3 year undergraduate or 1 year postgraduate	Commonly, approx. 6 months during course; + One year assessed practice after college	Usually not covered	Usually not covered
Social worker	Specialisations: Family and childcare; Mental health; Learning Disability.	Social Care Council equivalent	3 year undergraduate	Commonly, approx. 6 months during course; + One year assessed practice after college	Usually not covered	Systems vary: Usually not covered; Few notable exceptions

Behaviour Analysts

The professional title *Board Certified Behavior Analyst* (BCBA®) is based on Master's level training (BCBA-D is based on doctoral level training) that is approved by the Behavior Analyst Certification Board (BACB, 2014) and recognized by the National Commission for Certifying Agencies (NCCA) in Washington, DC. The BCBA qualification is recognized internationally and promoted by organisations, such as the European Association for Behaviour Analysis (EABA, 2014) and the Association for Professional Behavior Analysts (APBA, 2014).

Medical and allied health disciplines

For most parents of children with ASD, the General Practitioner or physician (GP) is the first port of call. Parents who go to their GP for advice about autism oftentimes expect to be given medication to alleviate the symptoms, despite the fact that the Maine Review (2009) considered pharmacological interventions for ASD as harmful. Most GPs will have received little or no training regarding ASD in their basic training, although online post-qualifying courses exist for those who want to learn about ASD (NICE, 2013a). With regard to research training, they will be mainly familiarized with intergroup comparison methods, such as randomised controlled trials (RCT) and thus have little knowledge of the research methodologies used in ABA (Keenan & Dillenburger, 2011; Dounavi & Dillenburger, 2013).

To guide the practice of health professionals, the National Institute for Health Care Excellence (NICE) published

1. Clinical guidelines for autism recognition, referral and diagnosis of children and young people (NICE, 2011);
2. Clinical guidelines for recognition, referral, diagnosis and management of adults on the autism spectrum (NICE, 2012); and
3. Clinical Guidelines on Autism: Management of Autism in Children and Young People (NICE, 2013).

It goes beyond the expectations of GPs to have read these reports or be fluent in their implementation and most health providers have designated teams whose responsibility it is to deal specifically with ASD-related issues, although the training for ASD co-ordinators or teams is usually not specified (Dillenburger, 2012; Friman & Jones, 2005; Maglione et al., 2012; Keenan et al., 2013).

Input by allied health professionals (AHP), such as clinical and educational/school psychologists, speech and language therapists/ pathologists, physiotherapists, and occupational therapists (Health and Care Professions Council, 2012) is provided routinely by relevant health services. The work of AHPs focuses on physical, mental, or developmental issues relevant to health, daily living, and work skills. AHP training generally includes very little specific training in ASD and almost never any training in ABA (BPS, 2013). Some specific ASD related intervention methodologies have been developed by AHPs, such as Sensory Integration Therapy (Occupational therapists) or More than Words (Speech and language therapists). There is little rigorous research evidencing the effectiveness of these procedures and some have been shown to be counterproductive (Lang et al., 2013).

Education Disciplines

Teachers and other educationalists are the key professionals when the child starts school but generally have had no training in ASD or ABA (Table 1); at best they may have received a one-off lecture during initial teacher training. Hart and Malian (2013) pointed out that although it is highly probable that teachers will encounter students with ASD in their classrooms ‘consistent with the findings from the state analysis [...] and of the National Research Council [NRC], most teacher graduates receive minimal to no preparation in evidence-based practices for students diagnosed with ASD’ (p.3).

Even educational/school psychologists have little or no training in ASD or ABA (American Psychological Association, 2009; Australian Psychological Society, 2013; DECAP, 2013; Heward, et al., 2005; Nuñez, 2011; Bahsoun, 2012; OEAC; 2011). Notwithstanding, the British Psychological Society (2012) asserts that ‘the rigorous scientific training provided by psychology degrees enables graduates to become skilled in evaluating evidence and in making evidence-based decisions in a range of areas of their everyday lives’ (p.9).

Social Care Disciplines

Social workers generally carry out needs assessments and refer service users to services that aim to meet their needs. Few social workers provide direct intervention services. In most social work courses the term autism is mentioned briefly, but there are no in-depth courses. Generally, social workers have received no training in ABA,

although in a small number of exceptional colleges in the USA, social workers can obtain training in behaviour analysis. This is not the case in social work training in Europe.

A common foundation

Multidisciplinary teams generally have the common aim to improve the quality of life trajectory of individuals and their families and the disciplines described here represent a wealth of knowledge on a range of important target behaviours. As mentioned above, behaviour analysis offers the knowledge base of how to arrange contingencies to achieve these targets. Lack of a knowledge in ABA across a multidisciplinary team can lead to a number of problems in the development and application of effective, evidence-based interventions.

Science is a systematic approach for seeking and organising knowledge about the natural world. In applied behavior analysis, this means socially important behaviors. (Cooper *et al.*, 2007, p.25)

In order to illustrate a way of adopting a consistent scientific basis that underpins interdisciplinary teamwork, the case study of a real project aiming to improve the life of children with ASD is described next.

Project A was an intensive care program for children with ASD based at a University and comprised of multidisciplinary faculty, i.e., psychiatrists, clinical psychologists, and social workers, and students, community services, and parents of children with ASD. Everyone in the team undertook basic training in behaviour analysis through an online training platform that included user-friendly videos and animations (Simple Steps¹, 2013). The platform was developed by a European team of behaviour analysts (4 BCBA-Ds and 2 BCBAs) together with service users and available in a range of European languages (Keenan *et al.*, 2013; STAMPPP, 2013). The team of Project A was involved in the further development of the online resource and translations that were culturally sensitive to their local contexts.

Project A was able to offer a coherent approach to the treatment of ASD where the various professionals worked closely together with students and parents delivering individually tailored intervention programmes. Project A was distinct in that it took a joined-up approach to the individual subject expertise of each member of a multidisciplinary team through common understanding of behaviour analysis. The behaviour analytic focus on building functional behaviours and developing necessary life skills broadened each of the single-disciplinary perspectives decisively and, at the same time, the focus on continuous data taking (i.e., single system designs) set new scientific standards of excellence.

Children entered Project A after having completed statutory diagnostic procedures. The parents' point of view was an important source of information. Following a thorough interview with the parents, Project A staff observed the children in their home and pre-school/kindergarten settings and performed assessments, such as the completion of the Psychoeducational Profile (PEP, 2013). In therapy, the core areas of child development that were addressed included joint attention, basic imitation, language and communication skills, motor skills, independence competences, and pre-school activities. Intervention procedures were based on functional assessment and analysis

¹ Some of the authors of this paper contributed to the development of Simple Steps supported by European Commission Funding. None of the authors have any financial interest in Simple Steps.

and were transparent to all. Data were taken on behaviour change before, during and after the intervention and procedures were adapted as necessary to ensure target behaviours were achieved as efficiently as possible.

The target behaviour of *imitation skills* serves as a good example. Given the pivotal importance of imitation skills for further development and learning, generalisation of these skills is key. In a multidisciplinary team that is based on consensus among professionals who have adopted the science of behaviour analysis as theoretical basis (or conceptual framework) a programme to target generalised imitation would include a behaviour analyst who teaches gross motor imitation of body parts, a SLT who teaches oral-motor imitation, an OT who teaches how to wash face or hands, a teacher who facilitates the child imitating some aspects of other pupil's behaviours at school, and importantly, parents who encourage the use of imitation skills at home.

Including parents in the intervention makes a decisive difference between an ABA-based and the traditional psychiatric and psychotherapeutic approaches that are still used widely in many parts of the world, where 'patients' are treated in individual sessions. In Project A, the joined training of all key people guaranteed that professionals and parents had a common understanding and a common language, thus achieving a high level of consistency across therapy, school, and home settings with remarkable improvements of the quality of life for the child and the family.

Conclusion

We briefly outlined the rationale behind multidisciplinary work and the potential problems of multidisplinary and eclecticism. We described the training background of the key disciplines involved in working with individuals with ASD. We found that ASD and ABA frequently were not an essential part of the training curriculum in these professions, but that an internationally recognised qualification in behaviour analysis exists. We argued that the scientific discipline of behaviour analysis provides a 'common ground' for multidisciplinary working and that this is particularly useful for the cooperation and collaboration between the health and social care and the educational systems.

We outlined that the scientific method that underpins ABA includes the careful and precise definition of the subject matter, a knowledge base that stems from basic and applied science, and a focus on individually tailored, person/child centred, continuously evaluated intervention procedures that allow multidisciplinary teams to work as 'one'. Does that mean ABA can be considered as 'one fits all'? Normally this term is used in a pejorative sense especially when it comes to such a heterogeneous diagnosis as ASD, but when the 'one' being referred to is a well-researched and clearly defined science, then the 'one' means consistency, agreement, transparency, and sensible collaboration.

USA and Canada has explicit guidance in support of interventions that are based on the application of the scientific methods derived from behaviour analysis.

'The purpose of this memorandum is to provide direction to school boards to support their use of applied behaviour analysis (ABA) as an effective instructional approach in the education of many students with autism spectrum disorders (ASD). This memorandum establishes a policy framework to support incorporation of ABA methods into school boards' practices. The use of ABA instructional approaches

may also be effective for students with other special educational needs.’ (Memorandum No. 140, 2007, p.1)

In other places official advice varies considerably. Across Europe, for example, there is relatively little training in ABA, and sometimes government departments still debate whether ASD services are the responsibility of Educational, Health, or Social Care Departments. Evidently, the crux of this debate revolves around who should be responsible for funding the necessary services.

Of course, even with clear guidance it is not always smooth sailing for service users or providers and difficulties in obtaining services or claiming health benefits remain. However, at least there is now some level of clarity as to what is considered best practice. Recent reports identified that when early intensive behaviour analytic interventions are offered, families and individuals with ASD are beginning to reap the fruits. Fein et al. (2013) for example, reported that significant numbers of children diagnosed with autism are now achieving optimal outcomes, meaning that their quality of life has improved to the extent that they require no specific support and, in some cases, may even no longer meet the criteria that led to their ASD diagnosis. These outcomes are statistically significantly linked to early intensive behaviour analytic interventions (Orinstein et al., 2014).

ABA is a science of behaviour, which, when applied to autism, empowers parents with the skills to harness principles of behaviour for bringing out the best in their children. Results produced when ABA is implemented correctly are quite remarkable and that is why parents persist despite the hard work involved. Sometimes the changes in the children who benefit from ABA are so extensive that they cause all sorts of problems for the establishment not familiar with ABA. For example, bureaucratic boundaries between education and health authorities are rendered meaningless when significant improvements in a child’s overall health and well-being are brought about by educational procedures. If everyone cares, then these bureaucratic boundaries need to be dismantled so that resources are marshalled in an efficient and cost effective way. (Keenan, 2006, p.48)

We have argued here that professionals who are trained in the scientific method of behaviour analysis have a common ground to develop truly inclusive collaborative evidence-based multidisciplinary work that brings out the best for individuals with ASD.

‘We propose that individuals who are recipients or potential recipients of treatment designed to change their behaviour have the right to a therapeutic environment, services whose overriding goal is personal welfare, treatment by a competent behaviour analyst, programs that teach functional skills, behavioural assessment and ongoing evaluation, and the most effective treatment procedures available.’ (van Houten et al., 1988, p381)

Ultimately, individualisation in autism intervention is not the same as ‘eclecticism’ or multidisciplinary. Truly individualized, child-centred, evidence-based interventions are carried out in close collaboration between relevant professionals where treatment decisions are determined by the behavioural data they produce.

References

American Psychological Association. (2009). Inaugural Editorial for Journal of Educational Psychology. *Journal of Educational Psychology*, 101, 259-261.

American Psychiatric Association (2013). DSM-5. Retrieved from the Web 02/11/2013 www.dsm5.org/

Associated Press (2014). *Autism families push for better, uniform coverage*. Retrieved from the Web 27/05/2014 www.journalnow.com/news/state_region/autism-families-push-for-better-uniform-coverage/article_993124b8-e489-11e3-a6b2-001a4bcf6878.html

Association for Professional Behavior Analysts (APBA, 2014). Retrieved from the Web 27/05/2014. www.apbahome.net

Australian Psychological Society APS College of Educational and Developmental Psychologists. (2013). Retrieved on 23 May 2013 from www.groups.psychology.org.au/cedp/

Bahoun, P. (2012). *Government expands insurance coverage of ABA therapy for treatment of autism*. Retrieved from the Web 28/07/2013 www.examiner.com/article/government-expands-insurance-coverage-of-aba-therapy-for-treatment-of-autism

Behavior Analyst Certification Board. (BACB; 2010). *BCBA & BCaBA Behavior Analyst Task List. 4th Edition*. Retrieved from the Web 20/05/2013 from www.bacb.com

Behavior Analyst Certification Board. (BACB; 2012). *Guidelines: Health plan coverage of applied behavior analysis Treatment for Autism Spectrum Disorder*. Retrieved from the Web 31/10/2013 from www.bacb.com/Downloadfiles/ABA_Guidelines_for_ASD.pdf

Bond, C. & Eldridge, S. (2012). A challenge of identity for academic primary care: Keeping the whole greater than the sum of its parts. *Primary Health Care Research & Development*, 13 403-405

British Psychological Society (BPS; 2012). Retrieved from the Web 02/11/2013 <http://www.bps.org.uk>

Centres for Disease Control and Prevention (CDC; 2013). Data & statistics. Retrieved from the Web 02/11/2013 www.cdc.gov/ncbddd/autism/data.html

Chasson, G.S., Harris, G.E., & Neely, W.J. (2007). Cost comparison of Early Intensive Behavioral Intervention and Special Education for children with autism. *Journal of Child and Family Studies*, 16, 401–413.

Chiesa, M. (2006). ABA is not 'A Therapy for Autism. In M. Keenan, M. Henderson, K.P. Kerr & K. Dillenburger (Eds.) (2006). *Applied behaviour analysis and autism: Building a future together* (pp.225-240). London: Jessica Kingsley Publishers.

Community Information Branch (2013). *The Estimated Prevalence of Autism in School Age Children Northern Ireland*. Belfast, Department of Health, Social Services, and Public Safety.

Cooper, J. O., Heron, T. E. & Heward, W. L. (2007). *Applied behaviour analysis*. New York: Macmillan Publishing Company.

Crowder, D. & Nordal, K. (2013). How should the practice of behavior analysis be regulated? Session chaired by G. Green & J.E. Carr. *Association for Professional Behavior Analysts 3rd Annual Convention*, Las Vegas (March, 21-23).

Dillenburger, K. (2011). The Emperor's new clothes: Eclecticism in autism treatment. *Research in Autism Spectrum Disorder*, 5, 1119-1128.

Dillenburger, K. (2012) Autism Spectrum Disorder: Evidence-based interventions. *National Association of Primary Care (NAPC) Review*, Spring/Summer, 134-135.s

Dillenburger, K. & Keenan, M. (2009). None of the As in ABA stands for autism: Dispelling the myths. *Journal of Intellectual & Developmental Disability*. 34, 193-195.

Dillenburger, K., McKerr, L., & Jordan, J.A. (2014). Lost in translation: Public policies, evidence-based practice, and Autism Spectrum Disorder. *International Journal of Disability, Development and Education* (Special Edition). 61, 134-151.

Doctorate in Educational, Child & Adolescent Psychology (DECAP; 2013). Retrieved on from the Web 23/07/2013

www.qub.ac.uk/schools/psy/StudyingAtTheSchool/PostgraduateTaught/DECAP/ProgrammeSpecification/

Dounavi, K. & Dillenburger, K. (2013). Behaviour analysis and evidence-based education. *Effective Education*.

Ernsperger, L. (2002). *Key to success for teaching students with autism*. Arlington, TX. Future Horizons. Inc.

European Association for Behaviour Analysis (EABA, 2014). Retrieved from the Web 27/05/2014.
<http://europeanaba.org>.

Fein, D., Barton, M., Eigsti, I.M., Kelley, E., Naigles, L., Schultz, R.T., Stevens, M., Helt, M., Orinstein, A., Rosenthal, M., Troy, E., & Tyson, K. (2013) Optimal outcome in individuals with a history of autism. *Journal of Child Psychology and Psychiatry*, 54, 195–205

Freeman, S. (2003). *Science for sale in the Autism Wars: Medically necessary autism treatment, the court battle for health insurance and why health technology academics are enemy number one*. Langley, B.C.: SKF Books USA, Inc.

Friman, P.C. & Jones, K.M. (2005). Behavioral treatment for nocturnal enuresis. *Journal of Early and Intensive*

Behavior Intervention, 4, 259-267.

Fryling, M.J. (2013). Theory, philosophy, and the practice of applied behavior analysis. *European Journal of Behavior Analysis*, 14, 45-54.

Hart, J.E. & Malian, I. (2013). A statewide survey of special education directors on teacher preparation and licentiate in autism spectrum disorders: A model for university and state collaboration. *International Journal of Special Education*, 28, 3-13.

Health and Care Professions Council. (August 2012). *Practitioners psychologists: Standards of proficiency*. Retrieved on from the Web 20/05/2013 www.hpc-uk.org/assets/documents/10002963SOP_Practitioner_psychologists.pdf

Heward, W. L., Heron, T. E., Neef, N. A., Peterson, S. M., Sainato, D. M., Cartledge, G. Y., Gardner III, R., Peterson, L. D., Hersh, S. B., & Dardig, J. C. (2005). *Focus on Behavior Analysis in Education: Achievements, Challenges, & Opportunities*. Upper Saddle River, NJ: Pearson/Merrill/Prentice Hall, c2005.

Howard, J., Sparkman, C., Cohen, H., Green, G., & Stanislaw, H. (2005). A comparison of intensive behavior analytic and eclectic treatments for young children with autism. *Research in Developmental Disabilities*, 26, 359-383.

Howley, M. Forword. In V. Cumine, J. Dunlop, & G. Stevenson (2009). *Autism in the early years: A practical guide* (pp. vii-viii). New York (2nd Edition). Routledge

Howlin, P. (2013). 70 years of autism research-how far have we come? *Autism Europe Newsletter*, Dec., 4-6.

Howlin, P. (2010). Evaluating psychological treatments for children with autism-spectrum disorders. *Advances in Psychiatric Treatment*, 16, 133-140

Jacobson, J.W., Mulick J.A., & Green, G. (1998). Cost-benefit estimates for early intensive behavioral intervention for young children with autism—general model and single state case. *Behavioral Interventions*, 13, 201-226.

Johnston, J. M. & Pennypacker, H. S. (1993). *Strategies and tactics of behavioral research*. Hillsdale, NJ: Lawrence Erlbaum.

Jordan, R. (2005). Autistic spectrum disorders. In A. Lewis & B. Norwich (eds) *Special teaching for special children? Pedagogies for inclusion*. Maidenhead: Open University Press.

Keenan, M. (1997). W -ing: Teaching exercises for radical behaviourists. In K. Dillenburger, M. O'Reilly, & M. Keenan (Eds). *Advances in Behaviour Analysis* (pp 48-80). Dublin: University College Dublin Press.

Keenan, M. & Dillenburger, K., (2012). If all you have is a hammer ...RCTs and hegemony in science. *Research in Autism Spectrum Disorders*, 5, 1-13.

Keenan, M., Gallagher, S., Dillenburger, K., Byrne, T., Booth, N., Martin, N., Röttgers, H.R., Strømngren, B., Virues-Ortega, J., Moderato, P., Roll-Pettersson, L., Schenk, J., Jonsdottir, S.L. & Douvani, K. (2013). *Simple Steps Autism: An online teaching platform for the treatment of autism*. Retrieved from the Web 23/07/2013 www.simplestepsautism.com

Keenan, M., Henderson, M., Kerr, K.P., & Dillenburger, K. (Eds.) (2006). *Applied behaviour analysis and autism: Building a future together*. London: Jessica Kingsley Publishers.

Lang, R., O'Reilly, M., Healy, O., Rispoli, M., Lydon, H., Streusand, W., Davis, T., Kang, S., Jeff Sigafoos, J., Lancioni, G., Didden, R., & Giesbers, S. (2013). Sensory integration therapy for autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, 6, 1004–1018.

Lord, C., Rutter, M., Goode, S. *et al.* (1989). Autism diagnostic observation schedule: a standardized observation of communicative and social behavior. *Journal of Autism and Developmental Disorders* 19, 185–212.

Lord, C., Rutter, M., & LeCouteur, A. (1994). Autism diagnostic interview-revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 24, 659-685.

Maginnis, K. (2008). *Independent review of autism services*. Belfast: Department of Health, Social Services and Public Safety.

Maglione, M.A., Gans, D., Das, L., Timbie, J., & Kasari, C. (for the Technical Expert Panel, and HRSA Autism Intervention Research – Behavioral (AIR-B) Network (2012). Nonmedical interventions for children with ASD: Recommended guidelines and further research needs. *Pediatrics*, 130, 169-178.

Maine Review (2009). *Interventions for autism spectrum disorders: State of the evidence*. Maine: The Maine Department of Health and Human Services and the Maine Department of Education.

McDaniel, B. & Dillenburger, K. (2014). *Child neglect and behavioural parent education: Research and practice*. Dorset, UK: Russell House Publishing Ltd.

Memorandum No. 140 (2007). *Incorporating methods of Applied Behaviour Analysis (ABA) into programs for students with Autism spectrum disorders (ASD)*. Ontario, Canada: Ministry of Education.

Motiwala, S.S., Gupta, S., Lilly, M.B., Ungar, W.J., & Coyte, P.C. (2006). The cost-effectiveness of expanding intensive behavioural intervention to all autistic children in Ontario. *Healthcare Policy*, 1, 135-151.

National Autism Center. (NAC; 2009). *Evidence-Based Practice and Autism in the Schools: A Guide to Providing Appropriate Interventions to Students with Autism Spectrum Disorders*. Randolph, MA. Retrieved June 23, 2013 at http://www.nationalautismcenter.org/pdf/NAC%20Ed%20Manual_FINAL.pdf

National Institute for Health Care Excellence (NICE; 2011). *Autism: recognition, referral and diagnosis of children and young people on the autism spectrum*. Retrieved from the Web 23/07/2013
<http://guidance.nice.org.uk/CG128>.

National Institute for Health Care Excellence (NICE; 2012). *Autism: recognition, referral, diagnosis and management of adults on the autism spectrum*. Retrieved from the Web 23/07/2013
<http://guidance.nice.org.uk/CG142>.

National Institute for Health Care Excellence (NICE; 2013a) *Autism in General Practice* (Royal College of General Practitioners). Retrieved from the Web 23/07/2013
<http://www.nice.org.uk/usingguidance/education/AutismInGeneralPractice.jsp>

National Institute for Health Care Excellence (NICE; 2013b). *Autism: Management of autism in children and young people*. Retrieved from the Web 02/11/2013 www.nice.org.uk/nicemedia/live/14257/64946/64946.pdf

Nuñez, J. C. (2011). Psicólogo Educativo. *Papeles del Psicólogo*, 32, 202-203.

Odom, S., Hume, K., Boyd, B., & Stabel, A. (2012). Moving beyond the intensive behavior treatment versus eclectic dichotomy: Evidence-based and individualized programs for learners with ASD. *Behavior Modification*, 36, 270-297.

Office of Personnel Management (2012). Retrieved from the Web 02/11/2013 www.huffingtonpost.com/jeremy-hilton/medical-necessity-of-autism_b_1646537.html

Offit, P. A. (2010). *Autism's false prophets: Bad science, risky medicine, and the search for a cure*. New York: Columbia University Press.

Ontario Ministry of Education. (2007). *Incorporating methods of Applied Behaviour Analysis (ABA) into programs for students with Autism Spectrum Disorders (ASD)*. Toronto, ON: Policy/Program Memorandum No 140 (PPM-140).

Oxford Educational Assessment Centre (OEAC; 2011). *White Paper - Autism and educational psychology*. Retrieved from the Web 5/8/2013 www.oead.co.uk

Psychoeducational Profile (PEP; 2013) Third Edition (PEP-3). Retrieved from the Web 29/07/2013
http://portal.wpspublish.com/portal/page?_pageid=53,70083&_dad=portal&_schema=PORTAL

Rhoten, D. (2003). *A multi-method analysis of the social and technical conditions for interdisciplinary collaboration*. The Hybrid Vigor Institute San Francisco, CA. Retrieved from the Web 31/10/2013
www.hybridvigor.net/interdis/pubs/hv_pub_interdis-2003.09.29.pdf

Robins, D. L., Fein, D., Barton, M. L., & Green, J. A. (2001). The modified checklist for autism in toddlers: An initial study investigating the early detection of autism and pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 31, 131–144.

Ryle, G. (1949). *The Concept of Mind*. Chicago, IL.: University of Chicago Press,

Science and the Treatment of Autism (STAMPPP; 2013). *A multimedia package for parents and professionals*
Retrieved from the Web 15/5/2014 www.stamppp.com

Simple Steps (2013). *The online teaching platform for the treatment of Autism*. Retrieved from the Web 15/5/2014
www.simplestepsautism.com

Surgeon General (1999). Surgeon General Report. Retrieved from the Web 31/10/2013
<http://profiles.nlm.nih.gov/ps/access/NNBBHS.pdf>

The Option Institute (2014). *The Son-Rise Program*. Autism Treatment Center of America. Retrieved from the Web
27/05/2014 www.autismtreatmentcenter.org

Thyer, B. A. & Kropf, N. P. (Eds.) (1995). *Developmental disabilities: A handbook for interdisciplinary practice*.
Cambridge, MA: Brookline Books.

Thyer, B. A. & Pignotti, M. (2010). Science and pseudoscience in developmental disabilities: Guidelines for social
workers. *Journal of Social Work in Disability and Rehabilitation*, 9, 110-129.

United Nations Convention on the Rights of Persons with Disabilities (CRPD; 2007) New York. Retrieved from the
Web 29/10/2013 http://treaties.un.org/doc/Publication/CTC/Ch_IV_15.pdf

Van Houten, R., Axelrod, S., Bailey, J.S., Favell, J.E., Foxx, R.M., Wata, B.A., & Lovaas, O.I. (1988) The right to
effective behavioral treatment. *Journal of Applied Behavior Analysis*, 21, 381–384.