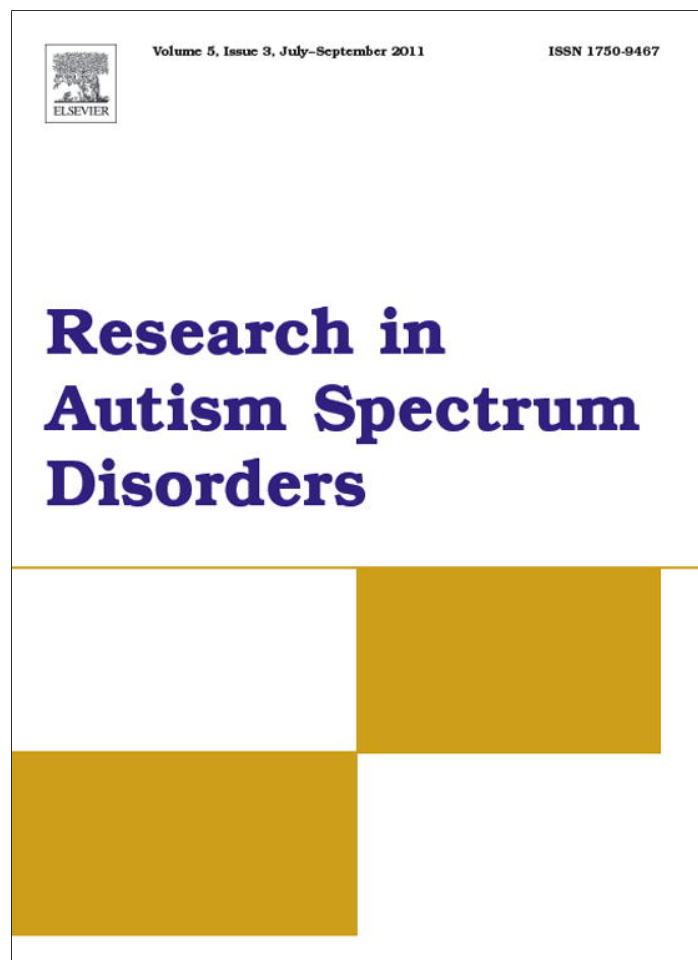


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The Emperor's new clothes: Eclecticism in autism treatment

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ABSTRACT

Increasingly, Applied Behaviour Analysis (ABA) is internationally recognised as the scientific basis for teaching and treatment in Autism Spectrum Disorders. Yet, many governments and professionals across Europe promote an eclectic model as more child-centred and pragmatic. This paper addresses the issues of eclecticism and ABA by exploring how misinformation stands in the way of evidence-based procedures that are truly unified, practical, and child-centred.

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When Galileo asked colleagues to look through his telescope at the newly discovered four moons of Jupiter, they replied, 'if your tube shows something that cannot exist it must be a rather unreliable tube' (Brecht, 1943/2007, p. 1). This paper argues that the attitude of many western governments to the use of Applied Behaviour Analysis (ABA) for treatment in Autism Spectrum Disorders (ASD) is not dissimilar. First, differences in government reports are described, then the 'eclectic' approach and Applied Behaviour Analysis are explored and finally the reasons for the differences in recommendations are clarified.

Autism Spectrum Disorders (ASD) are pervasive developmental disorders or conditions that affect communication and other social interactions as well as flexibility in thoughts and behaviour patterns (APA, DSM-IV-TR, 2000). The estimated prevalence rate across all age groups is approx 1:100 (CDC, 2010). Despite recent advances in brain imagery (Anderson et al., 2010; Dosenbach et al., 2010) and discover of certain genetic linkages (Szatmari et al., 2007), presently there are no medical tests that reliably identify individuals with ASD and consequently diagnosis is based purely on behavioural data, such as direct observations and parental/caregiver reports (Keenan, Dillenburger, Doherty, Byrne, & Gallagher, 2010).

The number of people diagnosed with Autism Spectrum Disorder has risen dramatically over the past decade. Whether this is caused by diagnoses becoming more precise, over-diagnosing, or an actual rise in incidents is a much-debated issue (Fombonne, 2005). In any case, recent studies have estimated that if not adequately treated the lifetime cost to care for an individual with an ASD can amount to as much as \$3.2 million (CDC, 2010). Therefore the issue of what constitutes the most appropriate response to diagnosis is very important (Freeman, 2003, 2007). Getting it right can save enormously, not only fiscally (Knapp, Romeo, & Beecham, 2007) but even more importantly, it has major impact both socially and emotionally, i.e., in terms of quality of life for individuals, families, and therefore society as a whole (Dillenburger, Keenan, Doherty, Byrne, & Gallagher, 2010).

There are some who think that there is no need for interventions at all and that accepting neurodiversity is the key (Fenton & Krahn, 2009). Of course, there is no doubt that acceptance and awareness of differences are crucial. But parents,

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individuals affected by ASD, and professionals realise that most individuals diagnosed with ASD need some kind of specifically tailored education or intervention (Baron-Cohen, 2008; Helt et al., 2008; Jordan, 2008; Lamb, 2009; Markram, Rinaldi, & Markram, 2007). The UNESCO Salamanca Statement (CSIE, 2010) is evidence of the international agreement that inclusion is the best way to show acceptance. However, inclusion is not to be equated with *contact* per se. Contact per se clearly is not enough (Pettigrew & Tropp, 2006) and specific conditions and skills are necessary for contact (e.g., everyone physically in the same classroom) to translate to full social inclusion (CSIE, 2010; Oxoby, 2009).

Currently there is much confusion and debate about what kind of education is necessary for inclusion to work with regard to children with ASD (Dillenburger, Keenan, Doherty, Byrne, & Gallagher, 2011). A large number of interventions for ASD are available requiring a range of skills that are based on disciplines from psychiatry, psychology, regular education, special education, social work, speech pathology, and physical therapy (Archart-Treichel, 2010), and, of course, neuroscience, medicine, psychotherapy, family therapy, occupational therapy, architecture, pharmacy, and many more. In addition, a number of parents have developed interventions for their own children that are not based on a particular discipline but that have become popular with other parents (e.g., Son Rise, Hanen). For some of these, elaborate manualised programmes have been developed that are sold at free market prices and require strict and often exclusive programme adherence and training.

1. Reports, reviews, practice guidelines

In order to decide which interventions to promote, many countries have commissioned detailed reviews of autism interventions as well as the development of practice guidelines, e.g., in the USA (NSP, 2009), New Zealand (Mudford et al., 2009), Northern Ireland (Task Group on Autism, 2002), Republic of Ireland (Task Force on Autism, 2001), Scotland (Dunlop et al., 2009), Germany (Weinmann et al., 2009), and Canada (Perry & Condillac, 2003). Intriguingly, but maybe not surprisingly, the recommendations from these reviews and practice guidelines have been very diverse and the actions taken by different governments across the globe have been equally varied. By-and-large there are two different kinds of directions: one that recommends treatment to be based on Applied Behaviour Analysis (ABA) and one that recommends treatment to be eclectic.

In most of North America it is generally accepted that interventions in ASD should be based on the scientifically applied knowledge of basic principles of behaviour, which is the domain of the discipline of behaviour analysis (Cooper, Heron, & Heward, 2007). These reports and guidelines are based on the increasing evidence of clinical (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Reichow & Wolery, 2009; Zachor, Ben-Itschak, Rabinovich, & Lahat, 2007) and social (Foster & Mash, 1999) effectiveness and financial efficiency (Knapp et al., 2007) of applying behaviour analytic knowledge to helping individuals and families affected by ASD. For example, the US Surgeon General endorsed ABA-based interventions as early as 1999:

Thirty years of research demonstrated the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior. (U.S. Public Health Service, 1999)

In Ontario, Canada, the *Ministers' Autism Spectrum Disorders Reference Group (2007)* concluded the following:

At this time, the research indicates that Applied Behaviour Analysis (ABA) based practices (including intensive ABA) are the only practices that meet the criterion of effectiveness evidenced in randomized or non-randomized controlled trials. (p. 21)

On the basis of systematic reviews of the research literature, increasingly, the use of ABA-based interventions is enshrined legally in North America. For example, the *Autism Treatment Acceleration Act*

requires that health insurers cover the diagnosis and treatment of autism spectrum disorders, including Applied Behavioral Analysis therapy and assistive communication devices. (ATAA, 2010)

The ATAA is presently before the Committee on Health, Education, Labor, and Pension and is preceded by 46 US States which have already taken action: 23 States have signed legislation that requires health insurances to cover ABA-based treatment; further 4 States have passed legislation, awaiting to be signed by the state governor; 10 States have endorsed autism insurance reform bills; and 9 States have autism insurance reform bills pending introduction or endorsement (Autism Votes, 2011).

In many states in Canada (e.g., Alberta, Northwest Territories, Yukon, and Ontario) individuals diagnosed with ASD are offered intensive behavioural interventions based on ABA regardless of age while others offer ABA-based intervention only to children (CTV News, 2010; Ontario Ministry of Education, 2007). The Ontario Department of Education Policy/Program Memorandum (PPM-140, 2007)

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

Recent evaluations of PPM-140 have shown overwhelming support from professionals and parents (Weiss, White, & Spoelstra, 2008).

2. The 'eclectic approach'

ABA-based treatments are not routinely supported by governments in much of Europe, with the notable exception of Norway, and instead a so-called 'eclectic approach' is promoted. Recommendations are made along the following lines:

... the consensus view from the expert strand and policy documents, indicate that a range of interventions (eclectic provision) should continue to be funded and provided for families. (Parsons et al., 2009, p. 4)

At present, there is no definitive evidence that supports one approach as being better than others for all children with ASD, or supports a single approach for all aspects of development; nor is there any evidence by which children could be matched to particular approaches. (Task Force on Autism, 2001, p. 117)

Parents, educationalists, health professionals, social workers and the voluntary sector may employ pragmatic, eclectic, individualised interventions to optimise a child's functioning, by promoting development of skills, or adapting the environment to compensate when skills are not present. (SIGN, 2007, p. 15)

On the basis of these recommendations, Government departments across Europe have heavily invested in eclectic, 'treatment as usual', or 'general special education methods'. For example in 2004, an All-Ireland initiative was launched for a new eclectic Centre for Autism that to-date has incurred nearly £7 million revenue expenditure.

Despite the fact that usually no coherent definition of 'eclectic' is offered, Government reports commonly assert that this means that treatments are selected from a whole host of available interventions that are applied according to identified needs. The eclectic approach is viewed as flexible and child-centred (Gladwell, 2010).

Who could possibly criticise an approach that is child-centred and pragmatic, that includes a range of interventions and that is matched to the child? Why is eclecticism controversial in the treatment of autism, why is it not recommended more widely in North America, and why are so many parents taking governments to tribunal over it? In fact, in some cases more money is spent in court than would have been required for years of delivery of the preferred, usually ABA-based, interventions. For example, in Ireland the case of Sean O'Cuanachain lasted 68 days in the High Court and cost €5 million (Healy & McDonald, 2008).

These tribunal cases are based on an argument that using a range of treatment options that are specifically tailored to each individual's needs does not necessarily equate to recourse to eclecticism in the sense inferred above; more to this later. First, let us explore what proponents of eclecticism in the treatment of ASD actually mean by the term 'eclectic'?

In actual fact, it is difficult to find exactly what is meant by the term because commonly, there are no clear definitions.

within the literature on ASD, the meaning of the term 'eclectic' is not always clear and it is not always possible to identify what theories, or models, are being used to support practice. (McConkey, Kelly, & Cassidy, 2007, p. 20)

As far as the dictionary definition goes, the adjective *eclectic* means 'deriving ideas, style, or taste from a broad and diverse range of sources, as in 'her musical tastes are eclectic' which could mean that she probably likes jazz, classical, as well as pop. The noun *eclectic* refers to 'a person who derives ideas, style, or taste from a broad and diverse range of sources' (Oxford Dictionaries, 2010).

With regard to autism treatment, where there are definitions, it is said that eclectic treatment is to be equated with special education. Chasson, Harris, and Neely (2007) explained that the term *special education* generally reflects an

... eclectic assortment of educational and therapeutic techniques that are as varied as the school districts from which they come. (p. 402)

Fig. 1 shows a schematic diagram of the traditional eclectic treatment model. Treatment components in this diagram are used as examples and are not to be considered exclusive. The eclectic model generally is based on the selection of more than one of these kinds of treatments.

In order to understand the implications of this kind of eclectic selection of interventions a number of questions need to be addressed.

1. What is new? An eclectic model may integrate newly evolving methods of interventions, however, in and off itself it does not develop any new interventions.
2. Are eclectic interventions effective? While some of the methods used in an eclectic mix may have an evidence-base of their own, there is no scientific evidence of effectiveness for others; some may even have been described as controversial or dangerous (Jacobson et al., 2005; Perry, 2000; Perry & Condillac, 2003; Tweed, Connolly, & Beaulieu, 2009).
3. What is the effect of the unique combination of interventions? There is no evidence-based research on the effect of an eclectic blend of interventions, with the exception of Howard et al. (2005) who found that eclectic approaches were less effective than ABA-based methods. Ultimately, a comprehensive component analysis would be required to differentiate between synergetic effects and the effects of particular intervention (Osborne & Reed, 2008)
4. What is the theoretical or knowledge base of eclectic interventions? While different interventions that are included may have theoretical bases, these are often conflicting and/or contradicting. Eclecticism in its own right does not have a coherent theoretical base.

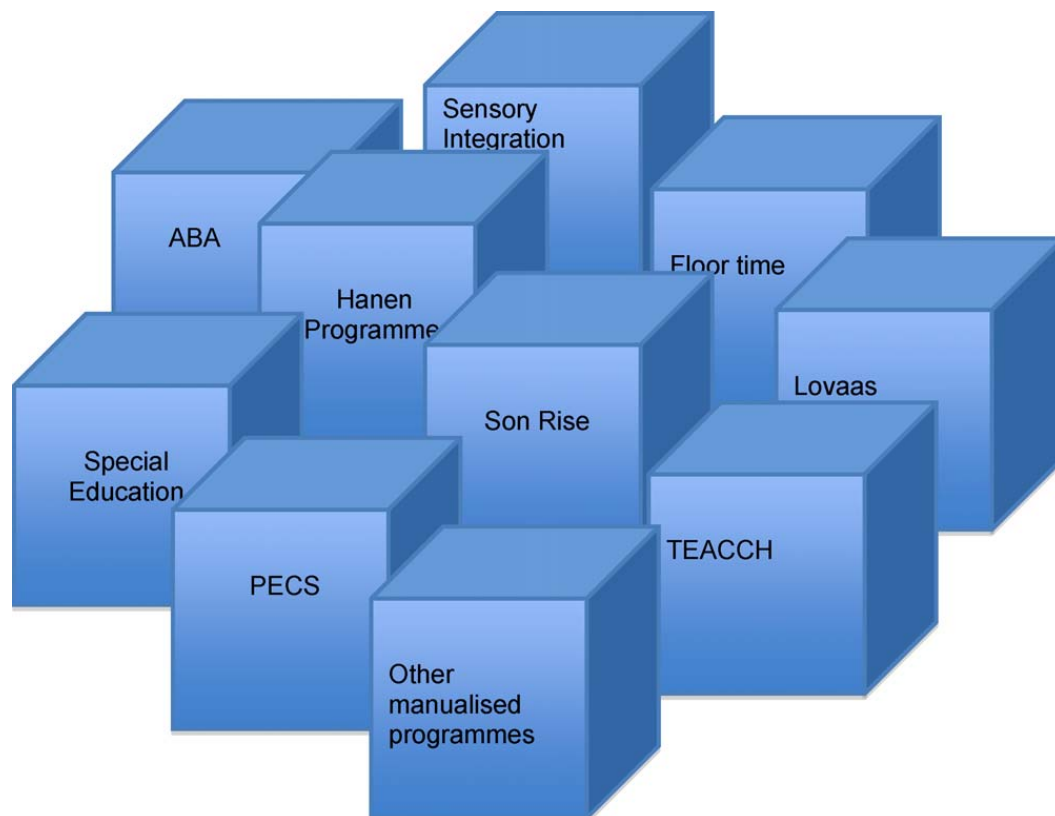


Fig. 1. Pick and mix: a schematic depiction of the traditional *eclectic model*, where a range of specific methods/models of intervention/commercial packages is used (many with no scientific evidence of effectiveness) with no coherent joint-up knowledge base. Decisions regarding the use of a specific method are based on programme availability within the setting and perceived need of individual/child.

5. Can staff be trained in eclectic interventions? Generally speaking, interventions that are highly regarded require extensive Masters- or even Doctoral-level University based training. Therefore, it is humanly impossible for the same practitioner to be appropriately qualified in all of the interventions that could be part of an eclectic intervention package.

As a result, eclecticism is based on claims and practices that may seem scientific, but that do not use valid scientific methodologies, have not and/or cannot be tested and therefore the approach lacks supporting evidence. In effect, eclecticism emerges as a pseudoscience (Gardner, 1957) and as Tavis (2003) outlined

Pseudoscience is particularly attractive because, by definition, [it] promises certainty, whereas science gives us probability and doubt. Pseudoscience is popular because it confirms what we believe; science is unpopular because it makes us question what we believe. (pp. xv–xvi)

3. Applied Behaviour Analysis

Proponents of eclectic interventions often say that ABA could/should be included in an eclectic model, because on its own it is too narrow. They usually equate ABA with one specific method of intervention, commonly Discrete Trial Training or so-called Lovass Therapy. In reality, Applied Behaviour Analysis (ABA) is defined as

a scientific approach for discovering environmental variables that reliably influence socially significant behavior and for developing a technology of behavior change that takes practical advantage of those discoveries (Cooper et al., 2007, p. 3). As a means to produce meaningful changes to behaviour ABA has demonstrated its effectiveness at the level of the individual, group or community. This effectiveness has been highlighted by the large number of publications, spanning back five decades, illustrating significant behavioural change that can be maintained after the intervention has ceased across a range of settings and behaviours (including educational, health, animal welfare, sporting performance, and psychological well being). (Mudford et al., 2009, p. 8)

The scientific process of Applied Behaviour Analysis is based on the knowledge of basic principles of behaviour that apply regardless of whether the behaviour is public (i.e., observable by others, such as walking, talking, and sitting) or private (i.e., observable by self, such as thinking and feeling) (Skinner, 1953).

The intriguing fact is that principles of behaviour are in operation whether we know about them or not. Take the case of gravity. Scientific scholars may study the phenomenon in great detail, but for the rest of us, gravity still exists, we use (or

abuse) it every day. We cannot NOT use gravity. In the same way, we cannot NOT use behavioural principles, they are operating, whether we want it or not, whether we know it or not. But when we know about these principles it makes little sense not to employ them to address socially relevant behaviours (Baer, Wolf, & Risley, 1968; Newman, 1992, 1998).

An intervention based on behavioural principles begins with the clear definition of the target behaviour. Target behaviours are identified in discussion with service users and/or their caregivers, i.e., individuals diagnosed with ASD or in the case of very young children, their parents, teachers, or other important adults. Generally, target behaviours are socially and/or educationally relevant and ‘ambitious’ (Lamb, 2009). Standard and/or specially devised curricula can be used as a guide for social and communication (Leiderman, 2010) as well as academic goals (National Curriculum, 2010), however, the choice of target behaviour ultimately is individually tailored and depends on identified needs (ACE, 2011).

Once defined, the function of the target behaviour then is assessed and/or analysed (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). Functional analysis is a complex process by which the contingencies of which the behaviour is a function are identified, so as to allow the development of precisely tailored interventions.

Meticulously defined dimensions of the target behaviour then are measured repeatedly for the baseline. Interventions are implemented that are tailored specifically to the function of the targeted behaviour while data, e.g., on frequency, duration, or fluency, are taken continuously throughout the intervention. This equates to concurrent assessment of the effects of the intervention, thus allowing for immediate adjustment, should the chosen intervention not have the desired effect. Specific intervention strategies are continuously adjusted until the desired effect on the targeted behaviour is achieved.

Finally, generalisation and maintenance procedures are put in place to ensure that the changes are generalised across behaviours, persons, and/or settings, and are maintained over time. Social validity data (Wolf, 1978) are collected from the individual in question, parents, teachers, or others to ensure that the target behaviour is of importance, the intervention is considered appropriate, and the changes are deemed significant in the social context to which they apply. Fig. 2 outlines the process of Applied Behaviour Analysis pertaining to ASD. At the foundation of behaviour analytic procedures is the knowledge of behavioural principles, an agreed ethical stance, and a knowledge base on ASD. The specific procedures developed from this basis in Fig. 2 are examples and by no means a complete list of procedures that can be developed.

Given that interventions are developed from the knowledge base of behavioural principles, the variety of interventions is unlimited when adapted to the needs of the individual. Of course, some specific intervention procedures have become particularly popular due to their general effectiveness, such as the use of discrete trials, precision teaching, natural environment teaching, pivotal response training, procedures based on verbal behaviour, or picture exchange systems. However, all ABA-based interventions are based on a functional assessment and/or functional analysis (Iwata et al., 1982/1994) and are individually tailored for each individual in their specific social context.

There is an extensive evidence base for the effectiveness of ABA as a basis of treatment in ASD. A recent literature search in PsycINFO, Pubmed, and ERIC (up to March 2008) found 2150 potential hits with regard to ABA and autism (Eldevik et al., 2010). While the main research methodology in behaviour analysis is time-series, single-system design (Johnston &

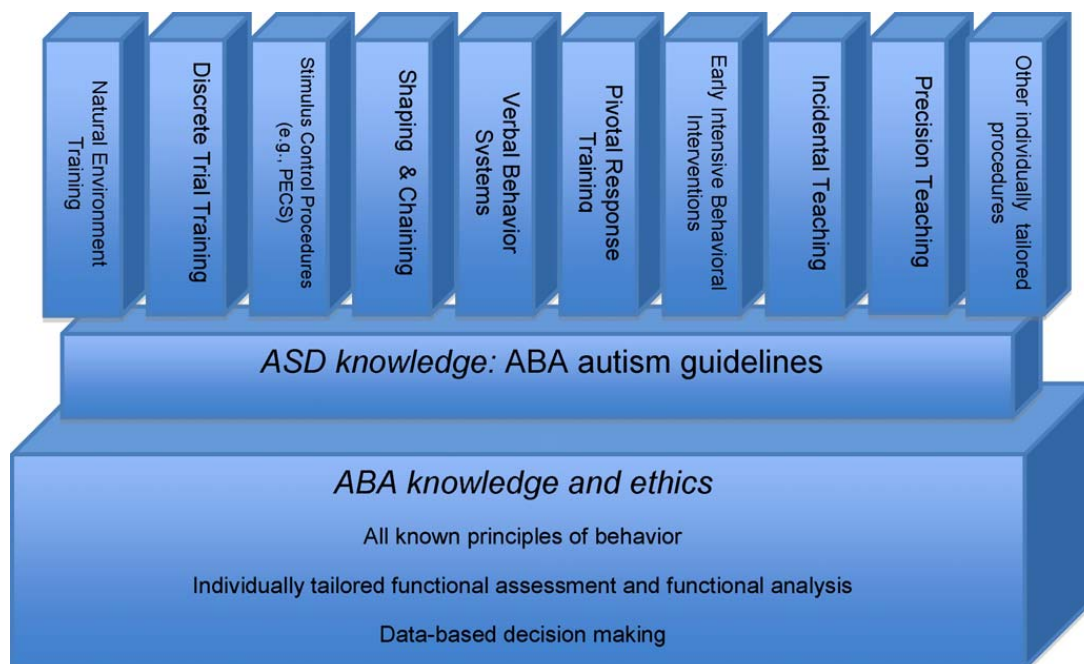


Fig. 2. Define, design, deliver: Applied Behaviour Analysis with the foundation in known principles of behaviour, ethical value base, and ASD knowledge, from which specific methods of intentions are developed. Intervention procedures are individually tailored (i.e., child-centred) and are based on carefully assessed need, baseline data, preference assessment, and functional analysis. Programmes evolve with the individual progress and decisions regarding treatment adjustment are based on continuous data collection.

Pennypacker, 1993), increasingly meta-analysis becomes available (Eldevik et al., 2009, 2010; Makrygianni & Reed, 2010; Peters-Scheffer, Didden, Korzilius, & Sturmey, 2011; Virués-Ortega, 2010).

Despite this wealth of evidence in favour of ABA-based interventions using above mentioned methodologies, Randomised Controlled Trials (RCTs) are considered by many the gold standard of evidence-based practice (NICE, 2009) and proponents of eclecticism have been vocal in criticising ABA for lack of RCTs (Morris, 2009). Inconsistently, the same sources have not demanded RCTs to support the implementation of an eclectic approach. That aside, Keenan and Dillenburger (2011) discussed the use of RCTs with respect to ABA and drew attention to the fact that RCTs were not designed to assess a science like ABA, but rather to assess specific medical procedures, namely the use of drugs.

Notwithstanding the controversy about the ethics and suitability of RCTs (Smith & Pell, 2003), a number of RCTs have been conducted to compare the effectiveness of ABA-based procedures with 'eclectic' treatments, e.g., special education or treatment as usual (Birnbauer & Leach, 1993; Cohen, Amarine-Dickens, & Smith, 2006; Eikeseth, 2009; Eikeseth, Smith, Jahr, & Eldevik, 2007; Eldevik et al., 2009, 2010; Howard et al., 2005; Magiati, Charman, & Howlin, 2007; Rogers & Vismara, 2008; Sheinkopf & Siegel, 1998; Smith, Groen, & Wynn, 2000; Zachor et al., 2007). All of these studies concluded that ABA-based procedures were considerably more effective than other interventions in bringing about measurable and desirable changes in a range of behaviours, from intellectual functioning to social skills, especially if they were intensive and timely. Eldevik et al. (2009) concluded that ABA offers the basis for well-established intervention modalities and confirmed serious concerns about eclectic treatment models.

The skills necessary to develop ABA-based procedures are clearly very far-reaching and sophisticated. In fact, they are the skills of the internationally recognised profession of behaviour analysis (BACB, 2010). Therefore, the development of ABA-based procedures in the classroom or at home requires the inclusion of a behaviour analyst in multidisciplinary work. Much the same as speech and language therapists, physiotherapists, teachers or social workers are included in the educational process of a particular child, well qualified behaviour analysts need to be included in the development of individually tailored, child-centred educational provision of a child on the autism spectrum.

Despite the evidence base and the process by which ABA-based interventions are developed, proponents of eclecticism have passionately critiqued Applied Behaviour Analysis as a single approach that is alleged to be inflexible and rigid. McConkey et al. (2007) provide a typical example:

Generally speaking, an eclectic approach is one that does not hold rigidly to a single paradigm (such as behaviourism) but, instead, draws on a wide range of theories, ideas, techniques and methods and can encourage cross-fertilisation and, possibly, the development of new approaches. (p. 20)

It is difficult to improve on this kind of misinterpretation, but Jordan (2001) did when she contended in a book review of Keenan, Kerr, and Dillenburger (2000) that,

Some of this [applied behaviour analysis] is intellectual nonsense, such as when an observation that ABA is criticised for not dealing with cognition or emotion is dealt with by simply redefining thinking as behaviour. In truth, one can "operationalise" thinking as any behaviour you choose, but that is playing Humpty Dumpty; you can say there is no need to consider intervening variables (which is at least an honourable intellectual position) but you cannot equate two quite separate levels of analysis. The argument in this book, then, fails as a scientific treatise. In fact it is reminiscent of a credo of belief, and the whole ABA movement appears increasingly more like a cult than a science: there is a charismatic leader, a doctrine, a failure to engage with criticisms, inquisition and denunciation of any who criticise (however mildly), misrepresentation of critics, and proseletysing exercises to gain converts and spread the word. (p. 421)

The important point here is that others (e.g., the general public and many policy makers) believe this, especially coming from such a widely cited author (Jordan, 2001). In reality, ABA offers a unified parsimonious approach that is flexible, individually tailored, and firmly rooted in data-based, scientific research evidence.

4. Reasons for differences in reports and guidelines

Based on the misconceptions in Government reports and practice guidelines outlined above, parents of children diagnosed with ASD are presented with a 'post code lottery' and professionals working in the field with a forced choice; either they put all their efforts into what is considered 'one basket', i.e., ABA-based interventions, or they go for an assorted, eclectic mix of methods. The former is portrayed either as too rigid (Jordan, 2008) or best practice (Chiesa, 2005), while the latter is viewed as more flexible (McConkey et al., 2007) or inconsistent and ineffective (Howard et al., 2005).

One could speculate that there may be cultural, linguistic, or financial reasons for these controversies, but on closer inspection Parsons et al. (2009) expose the reason for the differences between these reports.

Many recommendations in the literature are based on what appears to make good sense, by those experienced in the field, rather than on empirical evidence. For example, of the 28 recommendations from a working party convened to investigate practice in ASD in relation to diagnosis and assessment, 25 were based purely on "the expert Working Group advice" (NIASA, 2003, p. 9) and not on research findings. This was also the case in the Department for Education and Skills (DfES) Good Practice Guidance on ASD (DfES, 2002). (p. 31)

It is a very worrying state of affairs when government guidance is based on opinion rather than evidence, especially when it comes to spending £ € \$ millions of public = taxpayers' money. It would be justified for the public to demand that their money is spent on interventions that are based on research evidence rather than opinion or pseudoscience.

At the same time, when expert advice is given such a high profile, it becomes crucial that the experts are really knowledgeable in the field they are tasked to report on.

When it comes to writing about ABA in government reports in Europe, this is not the case. In fact, none of the writing teams in Europe included adequately qualified behaviour analysts. When describing ABA-based interventions these teams therefore worked outside their area of expertise, thereby breaking professional ethical guidelines, and consequently, description of ABA-based interventions are heavily flawed in most European report and guidelines. These mistakes have been pointed out repeatedly (Gladwell, 2010; Mattaini, 2008; PEAT, 2008). In one case, a review was initiated, but even the review body did not include an adequately qualified behaviour analyst and consequently the original misleading stance was confirmed (Keenan, 2010). This means that Governments continue to publicise inaccurate guidelines.

So far, it seems that there is only one example of an appropriate government response in Europe. In April 2009, the Autism Tool Box (Dunlop et al., 2009) was distributed to all schools in Scotland to guide their approach to children with ASD. The toolbox was written by a team of eminent autism experts and had been peer reviewed by the Autism Spectrum Disorders Education Working Group which included representatives of Her Majesty's Inspectorate of Education; Fife Council Psychological Services; National Autistic Society Scotland; Educational Institute of Scotland; Chair of Social and Educational Inclusion and Director of Inclusive Practice Project, University of Aberdeen; and the Scottish Society for Autism (Gilroy, 2009).

Despite this eminent team, the description of ABA was inaccurate, 30 years out of date, and made no mention of recent research findings or international evidence. In May 2009, the offer by a senior behaviour analyst (BCBA-D) to help correct the mistakes was considered inappropriate by the lead author of the Autism Tool Box (Gilroy, 2009). Over the succeeding month, parents of children with ASD in Scotland took legal advice, until in October 2009 the Scottish Government invited a leading behaviour analyst and an expert in autism to review the Tool Box. They both agreed that the section on ABA and other interventions were badly flawed.

In June 2010, after further action from parents the section on interventions finally was withdrawn from the Autism Tool Box and is awaiting a complete revision.

It seems obvious that the easiest way to avoid such embarrassment is to include appropriately qualified behaviour analysts, in the writing teams (for examples of international good practice see Mudford et al., 2009; NSP, 2009; Perry & Condillac, 2003) but this practice has not yet permeated into Europe.

The problem is not that the people involved are not caring, they are. Also, the problem is not that there are not enough qualified behaviour analysts or that they are difficult to locate; for example, there are over 8000 entries in the on-line Certificant Registry of the Behaviour Analysis Certification Board (BACB, 2010). The main problem is that when there are no appropriately qualified behaviour analysts involved in the writing process a major category mistake regarding ABA finds its way into these reports.

5. Category mistake

Ryle (1949/2002) introduced the term 'category mistake' for situations where things or facts from one category are presented as if they belonged to another; i.e., when 'two quite separate levels of analysis' are equated (Jordan, 2001). For example, when mother, father, and children are introduced (one category/level of analysis) and the visitor asks also to be introduced to the family (a higher order category/level of analysis), the term *family* is erroneously used as if it were in the same category (i.e., level of analysis) as *mother*, *father* and *children*.

When ABA is put in the same category as specific interventions in autism (see Fig. 1) a category mistake is made. ABA is not a specific intervention for the treatment of autism; it is the applied science division of the discipline of behaviour analysis (Chiesa, 2005; Cooper et al., 2007; Dillenburger & Keenan, 2009). Fig. 2 illustrates how interventions in ABA for ASD (one category) are developed from the basis of behaviour analytic knowledge and ethics in combination with specific knowledge regarding ASD (a different category). The category mistakes made in government reports across Europe have been one of the main stumbling blocks in bringing science-based interventions to individuals diagnosed with ASD and other additional and/or special educational needs.

The persistent refusal to acknowledge the detrimental effects arising from these category mistakes has a parallel with the struggles faced by Galileo that were mentioned at the start of this paper. Taverne (2010) portrayed the obstinate position of the establishment in relation to Galileo's discoveries by saying: 'We refuse to look at the evidence because our policy is fixed and that tells us the evidence cannot be true' (p. 26). That statement resonates with policy decisions made by government bodies in relation to ABA.

When the evidence is accepted and category mistakes are avoided, ABA is revealed as entirely child/person centred and pragmatic, and the term *eclectic* could even be used (Leiderman, 2010); i.e., a practitioner trained in the science of behaviour analysis selects from a broad and diverse range of intervention resources and develops and adjusts individually tailored additional interventions on the basis of continuous data collection. However, the total programme is based on a unified higher order category/level of analysis, namely the applied science division of the discipline of behaviour analysis.

Most behaviour analysts have avoided the term eclectic because it tends to imply a somewhat arbitrary selection of interventions (akin to 'pick and mix'), whereas the selection of intervention strategies within ABA is carefully defined, designed and delivered. Data are continuously collected on the target behaviour allowing for highly responsive adjustments to be made to the interventions, quickly and precisely. Reporting outcome data to the scientific and lay community is facilitated in numerous peer-reviewed journals, such as the *Journal of Applied Behaviour Analysis*, *Journal of Precision Teaching*, *The Analysis of Verbal Behaviour*, *Journal of Early and Intensive Behaviour Intervention*, and the *Journal of Speech-Language Pathology and Applied Behaviour Analysis*.

6. Conclusion

Despite the fact that countless reports and government guidelines have been written and £ millions have been spent on the treatment of ASD, recent studies have found parents of children with ASD are twice as likely to experience psychological ill-health (Keenan et al., 2010), stress (Burrows, 2010), and that there is a severe lack of confidence in the services that are available (Lamb, 2009). Children in Europe are still not routinely receiving treatments that are based on the best available evidence, and services for these families are wholly inadequate.

Why are Governments so blasé about the obvious category mistakes made in their reports? Behaviour analysts might suggest that the response cost for traditionally trained professionals is too high because accepting the evidence for ABA-based interventions could undermine previously held, precious, and therefore heavily invested beliefs, ideologies, and ways of working. It may even be suggested that principles of counter control are in operation that facilitate avoidance or escape from having to acknowledge lack of knowledge of the discipline of behavior analysis.

I know that most men, including those at ease with problems of the greatest complexity, can seldom accept the simplest and most obvious truth if it be such as would oblige them to admit the falsity of conclusions which they have proudly taught to others, and which they have woven, thread by thread, into the fabrics of their life. (Tolstoy, 1894; quoted in Morris, 2009)

Rather than getting embroiled in the arguments for and against eclecticism vs. single approach, this paper exposed the underlying assumptions as well as the implications for policy makers and society. Getting the treatment of ASD right will have implications for children with other additional and/or special educational needs when best practices in ASD are applied more generally (Horner, 1997). This is not only important on a personal level, for example in terms of quality of life for the individuals and their families, on a national and international level the associated costs savings are also increasingly important especially during the recent economic down turn.

We compared the costs associated with 18 years of special education to the costs associated with the implementation of an average of 3 years of Discrete Trial Training as an Early Intensive Behavioral Intervention (EIBI) in an effort to minimize the need for special education. Our results indicate that the state of Texas would save \$208,500 per child across 18 years of education with EIBI. When applied to the conservative estimate of 10,000 children with autism in Texas, the State would save a total of \$2.09 billion with EIBI. (Chasson et al., 2007)

Intensive Behavioural Intervention (IBI) describes behavioural therapies provided to autistic children to overcome intellectual and functional disabilities. ... Total savings from expansion of the current program were \$45,133,011 in 2003 Canadian dollars. (Motiwala, Gupta, Lilly, Ungar, & Coyte, 2006)

In sum, eclecticism does not offer new clothes to the emperor; it simply is a fashionable name for pseudoscientific ways of working. If Governments are serious about offering up-to-date best practice services for individuals diagnosed with ASD and truly breaking barriers to learning, they need to offer real 'new clothes', i.e., they need to invest in the ABA-based interventions.

Sixteen hundred and nine science' light began to shine. At Padua city, in a modest house Galileo Galilei set out to prove the sun is still, the earth is on the move. (Brecht, 1943/2007, p. 1)

Maybe in the year two thousand and eleven science's light will begin to shine on individuals diagnosed with ASD in Europe.

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