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A Critical Review of Applied Behavior Analysis (ABA): Trends & Gaps

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A Critical Review of Applied Behavior Analysis (ABA): Trends & Gaps

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Abstract: Applied behavior analysis (ABA) was initially developed in the 1960s based on behaviorist theories, gained popularity as a teaching method for individuals with ASD. The practice employs theoretical behavior analytic principles to address social and life skills amongst a few. With the wide acceptance and prevalence of ABA, the need to provide based on specific challenges of individual can get fogged. The present paper is a critical review of the trajectory of ABA and how it became the gold standard treatment for autism. It also focuses on identifying gaps in the current literature to guide the path for upcoming professionals working in the field of behavioral inteventions for children with autism.

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Background

Applied behavior analysis (ABA) was initially developed in the 1960s based on behaviorist theories by O. Ivar Lovaas. It has since then gained popularity as a teaching method for individuals with ASD. ABA is based on the idea that behavior can be analyzed, learned, and changed through reinforcement. The foundations of ABA were laid by the intensive work of Lovaas and the Young Autism Project, which aimed to promote prosocial behavior. These principles helped reduce the need for restraints in children exhibiting self-harm tendencies by focusing on reinforcing positive behaviors.

The practice employs theoretical behavior analytic principles to improve socially important behaviors. The therapy has been known to address social skills, verbal behavior, life skills, emotional regulation, independence, cognitive skills, and reduction of challenging behaviors (self-harming behaviors, aggression). It uses various tools and techniques to teach children these skills, some of the following are:

1. **Discrete Trial Training:** teaching specific skills by breaking them into simpler steps taught in one-to-one sessions.
2. P**rompts:** provide cues to the learner so they perform the desired task
3. **Token systems**: introduce points that can be used later to gain rewards.
4. **Social stories**: Using stories to teach social situations and social behaviors is expected to help them respond appropriately.
5. **Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH):** A close working relationship between parents and practitioners makes an individualized plan consistent with the child's needs and structured teaching experience.
6. **Picture Exchange Communication System (PECS):** Developed by Brondy and Frost in 1985, uses behaviorally based pictures as a form of communication system.

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Trends

Enrolling in Applied Behavior Analysis (ABA) is initially expected to be beneficial for children with a range of developmental disabilities, including autism, ADHD, language and communication disorders, as well as social, behavioral, and cognitive difficulties. The decision to enroll in ABA therapy typically depends on the individual needs of the child and their specific challenges.

Regarding the duration of ABA therapy, it's essential to consider the two program structures defined by the Behavior Analyst Certification Board (BACB): the comprehensive and focused models.

The comprehensive model suits children requiring intensive intervention to acquire essential skills. This program may continue for months or even years, involving several hours daily and multiple days weekly. The focus here is on teaching a wide range of daily life skills, with behavior technicians receiving frequent supervision from Board Certified Behavior Analysts (BCBAs). While the duration of a full-time comprehensive program can vary, it typically ranges from 20 to 40 hours per week (*IRIS | Page 5: Early Childhood: Comprehensive Interventions*, n.d.).

In contrast, the focused model targets specific behaviors that do not necessitate intensive training. This approach offers more flexibility and typically involves fewer weekly hours, averaging between 10 to 15 hours. The focused model is suitable for individuals who require targeted interventions rather than extensive skill development across various areas.

Ultimately, the decision regarding the type and duration of ABA therapy should be made in consultation with qualified professionals, considering the individual needs and goals of the child.

Assessing improvement in ABA therapy involves utilizing various assessment tools to compare baseline and post-therapy performance. These assessments help gauge progress and tailor interventions to individual needs. Professionals eligible to administer and monitor these assessments typically include Board Certified Behavior Analysts (BCBAs), behavior technicians, and other qualified clinicians trained in ABA techniques.

Several assessments are commonly employed to track improvement, like the Early Start Denver Model (ESDM), designed for children aged 12 to 48 months, which focuses on early developmental milestones such as social engagement, pointing, and eye contact. The Verbal Behavior Milestones Assessment Placement Program (VB-MAPP) assesses verbal behavior and language skills, identifying specific skill deficits to target for therapy. The Autism Diagnostic Observation Schedule (ADOS), currently considered the gold standard for diagnosing ASD, evaluates social interaction, communication, and play skills, providing a comprehensive overview of behavioral symptoms associated with ASD.

These assessments facilitate the identification of strengths and areas needing improvement, guiding the development of targeted intervention strategies.

Reports show that changes resulting from ABA therapy can be significant and varied, including improvements in communication, social interaction, adaptive skills, behavior management, and academic performance. Children may demonstrate increased independence, reduced problem behaviors, and enhanced overall quality of life. However, ABA therapy also has limitations. It may not be suitable for all individuals, particularly those with severe cognitive impairments or medical conditions significantly impacting participation. Additionally, access to ABA services may be limited due to factors such as cost, availability of trained professionals, and insurance coverage.

The individuals eligible for ABA therapy typically include those diagnosed with developmental disabilities such as autism, ADHD, language and communication disorders, and behavioral challenges. However, eligibility criteria may vary depending on the specific program or funding source. For children who are not eligible for ABA therapy or who may not benefit from traditional ABA approaches, alternative interventions and supports may be available. These may include speech therapy, occupational therapy, sensory integration therapy, special education services, and medical interventions tailored to individual needs. Caregivers need to work with healthcare providers and educators to explore and access appropriate interventions based on the child's unique strengths and challenges.

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Critiques

Table 1. History of a few critiques about ABA.

1. Use of punishment	These practices were considered highly controversial and have been found to lead to negative side effects and emotional reactions such as aggression. They are now not commonly seen in ABA. The use of punishment of any form should thus be reconsidered on ethical grounds (Fontes & Shahan, 2021).
2. Normality	Mental Health Advocates has strong concerns why neurodiversity needs to be changed given rising prevalence of ASD. A fundamental difference of behaviorism has been found with humanistic philosophical concepts. The approach of behaviorism views ASD as a problem for which there needs an intervention. For instance, the focus of ABA on reducing stimming stereotypic/stimming behaviors, which is a self-soothing behavior for those on the spectrum, takes away self-regulation of emotion. The focus, therefore, should be on enhancing neurodiversity rather than conformity (Kapp et al., 2019; Shyman, 2016).
3. Selection Criterion and Duration	While children >5 have been shown to benefit more from ABA, the exclusion criteria of ABA therapy remains unclear (Towle et al., 2020). Who gets ABA is based on discretion of the provider and not been standardized.
4. Measurement	Various assessments, such as PEAK, ABLA, and VerBAS have been found to have a misalignment in their reliability and validity (Padilla et al., 2023). A widely used test VB-MAPP had variability in reliability in the test domains. While most domains had moderate reliability, the individual domains revealed poor reliability (Montallana et al., 2019). Tools to measure progress lacks validity and inspires scrutiny.
5. Outcome Measures	Studies observed interventions used in ABA to be effective in improving expressing language, communication, and socialization. However, no change was observed in IQ, general autism symptoms, and daily living skills (Makrygianni et al., 2018; Yu et al., 2020).
6. Ethical Issues	Continue a long-term intense treatment without substantial empirical evidence remains highly contentious with reports of progressing into other mental health conditions such as post-traumatic stress disorder symptoms (Kupferstein, 2018; Wilkenfeld & McCarthy, 2020).

Tracking the Footsteps of the Currently Referred Gold Standard for ABA

The methods of Lovas in initiating concepts of operant conditioning to address challenging behaviors of those with autism gained popularity in the 1970's. This popularity followed establishments such as the Journal of Applied Behavior Analysis (JABA) in 1968, with which clinicians started to use this as an intervention with their clients. Formalizing of ABA practices with professionals was introduced by the Behavior Analyst Certification Board (BACB) formed in 1998. While many professional organizations endorse ABA as a treatment modality and state its effectiveness, there is no explicit use of the term 'gold standard' by leading organizations such as the National Institute of Mental Health (NIMH), BACB, American Academy of Pediatrics (AAP).

The scientific evidence supports ABA to bring positive outcomes such as reducing challenging behaviors and even teach new skills. However a longitudinal model for evidence is missing. Henceforth, there is a dearth of data to reveal the long-term effects of the techniques of ABA in terms of retainment of learned skills and consequences. The term of 'gold standard' came into existence gradually when research was suggesting promising results, varied organizations endorsed ABA as a method of intervention.

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However, interstingly policy implementations and federal laws were implemented after court rulings initiated by parents of children with autism and organizations such as autism speaks and autism society of America. The arguments presented in the court refrred to ABA as a "medically necessary treatment" and refusal of insurance coverage could be considered as discrimination. The ripple effect began with disability rights organiszation and public interest law firms started an aggressive advocacy. There were multiple notable cases such as **Harlick v. Blue Shield of California** (2012), **Oberti v. Board of Education of the Borough of Clementon School District** (1993) that led to movement. These state reforms and laws once passed were enforced with state insurance departments working towards implementation of these laws by the insurance companies. The **California Department of Insurance (CDI), New York State Department of Financial Services (DFS)** covers ABA as a medically necessary treatment. With of the system working towards making ABA as the intervention for Autism, Indiana became the first state in 2001 to put a seal and act on the legislation.

Affordable care act in 2010 further accelerated the process of covering ABA as the most effective intervention.

While research studies and organizations have found ABA to be an effective technique to address challenging behaviors, additional factors have contributed to portray it as the sole or 'gold standard' form of treatment for autism.

Why Does ABA Need a Critical Appraisal?

There are many strong critiques of past practices in ABA and their implications on present approaches. Firstly, the Punishments, historically, ABA has employed punishment-based procedures, including aversive techniques such as shocks and spanks. While these methods were later discontinued due to ethical concerns, non-invasive punishment-based procedures are still implemented in some cases. Critics argue that such approaches may lead to physical abuse and have negative side effects, including aggression and emotional reactions, as highlighted by Lerman and Vorndran (2002) (Vollmer, 2002). ABA practitioners must prioritize positive reinforcement strategies over punitive measures to ensure the well-being of individuals receiving therapy. Secondly, the intensity of Intervention, the comprehensive and focused models of ABA therapy, which involve 20-40 and 10-20 hours per week, respectively, can be physically and emotionally exhausting for children. Critics suggest that such intense interventions may not always be developmentally appropriate or sustainable for individuals, emphasizing the importance of considering the child's needs and readiness for therapy. Balancing intervention intensity with the child's well-being is crucial to ensure effective and ethical treatment. Lastly, reducing Self-Stimulatory/Stereotypic Behaviors given ABA has traditionally aimed to reduce self-stimulatory or stereotypic behaviors, commonly referred to as "stimming." However, activists and professionals in the field argue that these behaviors serve as ***self-soothing mechanisms for individuals with ASD***, helping them manage stress and anxiety. Critics suggest that instead of seeking to eliminate these behaviors, therapists should empower individuals to explore alternative coping mechanisms and create an accepting environment that embraces neurodiversity. It's essential to recognize the functional value of stereotypic behaviors and prioritize supporting individuals in regulating their emotions rather than enforcing conformity.

How Field Has Shifted Towards Progressive ABA

Progressive ABA represents a paradigm shift towards non-aversive and non-invasive methods for behavior modification, supported by emerging research. This approach acknowledges that behaviors can be effectively changed without resorting to punitive measures or invasive techniques (Leaf et al., 2022). The self-advocates, such as Amy Sequenzia, highlight concerns with traditional ABA practices. Sequenzia criticizes ABA for promoting neurotypical behavior as the ideal standard and attempting to modify autistic individuals' natural ways of interacting with the world, which she argues is unjustifiable.

Moreover, critiques within the field have pointed out that ABA often focuses excessively on modifying problematic behaviors, potentially neglecting to nurture and enhance individuals'

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strengths. This narrow focus can be counterproductive to fostering holistic development. Furthermore, critics have noted that the push for inclusive classrooms sometimes results in attempting to fit all children into a single mold, overlooking individuals' diverse needs and learning styles. The consequences of overlooking these critiques include potentially reinforcing harmful stereotypes, inhibiting individual growth, and perpetuating a one-size-fits-all approach to education and therapy.

It is essential for practicing behavior analysts to prioritize positive reinforcement-based contingencies and non-invasive interventions when working with individuals diagnosed with ASD. Training programs for behavior analysts should be closely monitored to ensure adherence to ethical standards and a commitment to promoting the well-being and autonomy of individuals with ASD. Embracing a progressive approach to ABA that values neurodiversity and focuses on enhancing strengths alongside addressing challenges is crucial for fostering inclusive and effective interventions.

Is ABA an Evidence-Based Treatment? Does It Withstand Empirical Scrutiny?

The prevalence of autism spectrum disorder (ASD) is on the rise, with recent data suggesting that one in 36 children under the age of eight in the United States may be affected (*Data & Statistics on Autism Spectrum Disorder | CDC*, n.d.). This increasing prevalence brings with it a significant burden of untreated mental health issues alongside ASD. Despite parents' continued search for effective treatments, a limited selection of evidence-based interventions remains available.

Over the past four to five decades, efforts have been directed toward understanding ASD, its core symptoms, associated presentations, and various developmental profiles. It's clear that ASD is becoming more prevalent in the community and is also observed at higher rates in psychiatrically referred populations. However, despite this growing understanding, treatment options remain limited.

While ABA was once thought of as a gold standard treatment, concerns have arisen due to a perceived lack of substantial evidence supporting its efficacy. ABA has been utilized for various conditions beyond ASD, leading to a misconception that it is exclusively tailored for ASD. The increasing number of providers, coupled with pressure from families seeking treatment, has attracted significant venture capitalist funding into ABA-type services, resulting in an industry valued at over multi-billion.

It's crucial to comprehend this context when assessing the services offered and the criticisms surrounding them. There is a scarcity of trials examining the efficacy of ABA, and it remains unclear which children and adolescents would benefit most from these fundamental therapies. The effectiveness of ABA in treating ASD is further limited by factors such as the severity of symptoms, the age at which intervention occurs, and cognitive development.

A 2018 reputable Cochrane review, widely regarded as one of the most comprehensive assessments of evidence, identified only five controlled trials that studied ABA's effectiveness. However, this review also highlighted significant biases in the analyzed studies (Reichow et al., 2018). Despite the substantial demand for ABA therapies, there remains a notable ***absence of prospective, long-term studies capable of providing comprehensive data on their efficacy***.

A recent scoping review highlighted several concerns regarding the outcome measures used in studies assessing the effectiveness of applied behavioral analysis (ABA). These measures typically fall into eight categories: cognitive ability, language, social and communication skills, adaptive and emotional behavior, and quality of life. Interestingly, none of the studies included in the review measured quality of life. Of the approximately 770 individuals included in the review, only 32 (4%) were assessed for the impact of ABA compared to other interventions or controls. This underscores the need for large-scale prospective studies that not only compare ABA with non-ABA interventions but also incorporate measures of quality of life (Gitimoghaddam et al., 2022).

Early research by Lovaas and colleagues showed that higher intensity ABA (35+ hours per week) yielded significantly better outcomes(Linstead et al., 2017). However, more recent studies suggest that 15 hours of ABA therapy per week can be just as effective as 25+ hours, depending on factors

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such as the individual's age and cognitive abilities (Rogers et al., 2021). This indicates that successful results can be achieved with fewer therapy hours, offering families more flexibility and making ABA a more accessible option.

Moreover, the argument that ABA is a standard part of care is being challenged, particularly due to the lack of empirical support for its theoretical models. Critics also raise concerns about the potential negative impacts of ABA, ethical considerations, and its implications for normalizing neurodiversity.

Table 2. A list of critical questions how the quality of evidence that supports ABA.

Questions about Studies	Explanations
1. Lack of comparison group	Trials without comparison group could not find differences and lacks evidence. Trials lacks methodological rigor.
2. No prospective studies	There are no long-term trials that studied ABA effectives.
3. Bias	There are concerns about bias in few studies that support ABA for ASD with higher likelihood of conflicts of interest. When review of literature controlled for bias, the effects were not observed.
4. Outcomes measures lacks QoL	A scooping review has raised questions if studies has shown that ABA improves overall quality of life.
5. Questions about SoC	Does ABA is considered a standard of care is not empirically substantiated.

Conclusion

It is evident from recent literature reviews that ASD remains a highly complex condition characterized by core symptomatology and co-occurring disorders. Diagnostic concerns persist as screening tools often fail to recognize its symptoms, resulting in delayed diagnosis, particularly among individuals with atypical developmental phenotypes. Notably, many individuals with ASD tend to experience variability in symptoms. Moreover, widely used diagnostic tools raise serious concerns about their validity and reliability. As the prevalence of ASD continues to increase, it is imperative to reevaluate the understanding of the disorder and distinguish between what is considered normative and what aligns with a neurodiversity paradigm.

Historically, ABA has been marketed as a gold standard treatment for ASD. Given that ABA is a form of intensive behavioral therapy, as expected, it has applications beyond ASD. Its principles such as positive reinforcements and behavioral modifications have shown to be effective for behavioral-related issues like ADHD and ODD (*Effectiveness of Applied Behavior Analysis Therapy Against Decreased Distracted Behavior in Children Attention Deficit Hyperactive Disorder | Seftiani | Psikostudia : Jurnal Psikologi*, n.d.; Leonardi & Rubano, 2012). However, there is a lack of evidence from long-term perspective studies to substantiate its claim of effectively addressing deficits associated with ASD. Many studies lack comparison groups, and those that do exist often exhibit significant biases, raising the level of scientific scrutiny. Unlike the pharmacological industry, which heavily relies on statistical differences with placebo arms and effect sizes for approval, ABA lacks empirical evidence for its efficacy in treating ASD.

While ABA is based on robust theoretical models involving operant and behavioral conditioning strategies, there are limitations to its effectiveness and concerns about overall efficacy. Researchers, public health advocates, and other stakeholders have raised concerns about the cost, lack of equitable healthcare access due to lengthy treatment durations, variability in outcome measures, and lack of empirical data supporting its theoretical models.

Furthermore, questions arise regarding the rationale for treating a diverse range of behaviors in individuals across the spectrum. Despite clinical conundrums and diagnostic concerns, there are serious questions about whether ABA improves the quality of life for individuals with ASD and if it

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should be considered standard care. The verdict on ABA's efficacy remains uncertain, as multiple trials have not consistently demonstrated its effectiveness.

Conversely, many individuals with ASD who have undergone comprehensive evaluations and received alternative treatments and support may have outcomes that have not been compared to those undergoing ABA. Therefore, while awaiting further research, thorough scientific scrutiny is necessary to question the validity of treatments and explore alternative options, including validated pharmacological interventions and supportive-based treatments.

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