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## Special Issue

Some Important Topics in Applied Behavior Analysis as it Relates to Autism

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# Editorial

**Dear IEJEE Readers,**

It's a great pleasure for me to present this special issue about the scientific strengths and practical challenges that characterize Applied Behavior Analysis (ABA) in our time. Near thirty active researchers within the field of autism/autism spectrum disorder (ASD) express their ideas, experiences and achievements in the field of ABA. They share their concerns about their observations in the field. Through this special issue, they are exposing themselves to the public room. They are doing this while we are celebrating AUTISM AWARENESS MONTH of April.

The field of ABA has a strong scientific knowledge base. It is not only involved in, but it has been the main contributor to the establishment of twenty-eight evidence-based practices (EBPs) for children and youth with ASD/autistic children and youth. With these EBPs one can give a helping hand to individuals at different ages to improve their socially significant behaviors; social, communicative, functional and adaptive skills.

I do not have any doubt that the topics and concerns they are addressing will contribute to eye-opening and strengthen scientific awareness and scientific seriosity in the field. It will not be an exaggeration to claim that the thirteen papers have the potential to start a paradigm shift in the field of Applied Behavior Analysis toward more ethical, more progressive and more reflective practices with fidelity, by everybody, for individuals with autism / autistic individuals.

Thanks to Drs Joseph H. Cihon, Justin B. Leaf and Ellie Kazemi for their editorialship for this valuable special issue of IEJEE.

**Dr. Kamil ÖZERK, Professor of Education**
**Editor-In-Chief, IEJEE**


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# Editors' Note: Important Topics in Applied Behavior Analysis as it Relates to Autism

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## Erratum Note

Dear IEJEE readers,

With this notification, we wish to inform you that an erratum has been identified in the article titled "Editors' Note: Important Topics in Applied Behavior Analysis as it Relates to Autism," authored by Joseph H. Cihona, Justin B. Leaf, Ellie Kazemi.

To rectify this erratum, you can access the corrected article with the following details:

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If you have any questions or feedback regarding this correction, please do not hesitate to contact IEJEE (International Electronic Journal of Elementary Education).

We apologize for any confusion caused by this error and want to emphasize that this correction note has been published to rectify the error and provide accurate information.

Sincerely,

IEJEE Editors

## Introduction

The field of behavioral intervention as it relates to intervention for autistics/individuals diagnosed with autism spectrum disorder[1] (ASD) has grown exponentially. As with the growth of any field dedicated to the service of others, this growth has come with its successes and failures, its inspiration and trepidations. Undoubtably, the lives of many diagnosed with ASD and their families have been improved through the dissemination and accessibility of quality behavioral services based on the science of applied behavior analysis (ABA). There is also little doubt, and emerging evidence, that the challenges related to the rapid growth of the field have also resulted in harms as a result of the misapplication or malpractice of ABA-based services. Answers to how we may

address concerns related to this rapid growth such as maltreatment, improved quality, and increased access to progressive methods are not easy and cannot be answered in a single manuscript or issue of a journal. The purpose of this issue, instead, is to continue and expand on discussions examining some recent important topics in behavioral intervention specifically as it relates to care available for autistics/individuals diagnosed with ASD.

There are several broad topics included across the papers in this special issue ranging from private equity to perspectives of autistic individuals to advances in research, and credentialling to compassion. Each paper takes an in-depth examination of each particular topic pushing us all to think deeper about the contingencies operating on our field and their effects. Furthermore, this special issue includes a variety of perspectives within ABA and autism intervention in an effort to provide the reader with pathways forward for behavior analysts, parents, and other professionals.

Zane and colleagues highlight the importance of reflecting on our own world views and how that impacts the quality and type of services we provide. Leaf and colleagues discuss the difficult crossroads behavior analysts can find themselves in when navigating working collaboratively while remaining faithful to the principles of our science. Dillenburger and Keenan identify parallels in discrimination practices experienced by immigrant communities in Britain after World War Two and the current debate among behavior analysts and anti-ABA advocates and discuss pathways forward. Lui reminds us of the possible damaging effects of overpromoting any particular narrative related to autistic perspectives. Gerhardt and colleagues highlight the importance of targeting meaningful curriculum to support independence as early as possible.

Melton and colleagues discuss the importance of leading with compassion and extending the current discussion around compassion to direct-line interventionists. Kristiansen provides a wonderful summary and description of the recommendations within the literature to increase cultural responsiveness in ABA.

Linnehan and colleagues begin a discussion about the contingencies leading to the development of certification and licensure within ABA as well as the resulting unintended consequences. Kazemi extends the discussion of certification and licensure to the challenges and benefits of accreditation of organizations. Gershfeld-Litvak provides a balanced discussion of the possible benefits and drawbacks of private equity entering into the field of ABA-based interventions for autistics/individuals diagnosed with ASD.

Dixon and colleagues make a strong argument for the use of group design methods and statistical analyses in an effort to expand the impact the science of behavior analysis can make on the world. Saunders provides an empirical evaluation of supervision strategies that can improve treatment fidelity as well as job satisfaction for behavior technicians providing intervention for autistics/individuals diagnosed with ASD. Finally, Ferguson and Milne examine the research to highlight progress in moving the field to a more progressive approach to ABA while highlighting several areas for continued research and improvement.

Our field has come a long way as measured by many metrics (e.g., number of individuals holding certifications, insurance providers funding ABA-based interventions for autistics/individuals diagnosed with ASD, behavior analytic publications). Nonetheless, it has yet to live up to its fullest potential and has had many missteps along the way. Our hope is that the articles included in this special issue that highlight some of our successes as well as our missteps lead to continued progress and change, especially as it relates to ABA-based interventions for autistics/individuals diagnosed with ASD. Progress at a large scale may not be easy or fast, but shifting our focus on the contingencies preventing and leading toward that progress may make the road toward progress a bit smoother and more welcoming to others focused on improving the field and outcomes for the clients we are fortunate to serve.

**Footnotes**

[1]The terms diagnosed with autism/ASD, on the autism spectrum, individual with autism/ASD, and autistic are used throughout this paper. The authors recognize that there are varied preferences and conventions related to person- and identify-first language among the academic and autistic communities. The terminology selected for use in this paper is to be inclusive of varying preferences as well as grammar and stylistic needs and does not reflect a terminological intent.

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# One Worldview to Rule Them All

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## Abstract

Behavior analysis is the scientific study of behavior. Radical behaviorism is the worldview of behavior analysts and this perspective drives how we think about behavior, assess the influences on behavior, and develop strategies to change behavior. There is evidence that some behavior analysts are using interventions that are not conceptually consistent with foundational principles, which results in using treatments not based on strong scientific evidence of effectiveness, and thus, are less effective and potentially harming the client. The reasons for this drift (from radical behaviorism) could be due to inadequate training in our philosophy, poor supervision, persuasion, and financial contingencies, among others. To maximize positive impact on the consumer, and to stay true to scientific roots, behavior analysts must adhere to the worldview of behavior analysis and radical behaviorism. By doing so, one's work will be based on science, and thus will protect our science and, more importantly, the consumer.

**Keywords:**

Behaviorism, Radical Behaviorism, Worldview, Conceptual Consistency, Evidenced-Based Practice

## Introduction

Behavior analysis is the scientific study of behavior, as espoused by Jones (1924), Pavlov (1927), Skinner (1938), Thorndike (1898), Watson (1913), and many others. Due to the strict adherence to a worldview built on the philosophy of radical behaviorism which influences how research and practice are conducted, behavior analysis has made incredible gains in understanding human behavior. For example, behavior analysis has caused a paradigm shift in the treatment and prognosis of autism spectrum disorder (ASD), where behavior analysis is recognized as the most effective treatment for this disorder (United States Department of Health and Human Services, 1999). Not to be forgotten, though, is the extent to which the methodologies born from radical behaviorism has had a major impact on other areas, such as sports (e.g., Luiselli & Reed, 2011; Tai & Miltenberger, 2017), addiction (e.g., Silverman et al., 2008), human safety (e.g., Dickson & Vargo, 2017; Geller, 2005), space (e.g., Brady, 2007), gerontology (e.g., Dwyer-Moore & Dixon, 2007), juvenile delinquency (e.g., Serna et al., 1986), education (e.g., Keller, 1968), healthcare (e.g., Friman et al., 1986), and sustainability (e.g., Bekker et al., 2010). In whichever area that this philosophy (and the methodologies connected to it) has been applied, significant improvement has been accomplished. The power of behavior analysis comes from its foundation and philosophy of science

(Skinner, 1950; 1953).

However, within the practice wing of behavior analysis, there are signs of drifting from the scientific core foundational worldview (e.g., Schreck, et al., 2008; 2016; Zane & Ellis, 2014). Put bluntly, individuals claiming to be behavior analysts seem to be using treatments and interventions that are considered 'fad' treatments (e.g., sensory integration therapy, hypnosis, facilitated communication; Zane et al., 2016). By doing so, these individuals are discarding the adherence to quality evidence and research supported by the worldview that should have been developed when learning about behaviorism and behavior analysis. Evidence of this drift is found from many sources. For instance, Schreck and Mazur (2008) surveyed Board Certified Behavior Analysts (BCBAs) about their use of different types of autism treatment (some of those treatments were evidenced-based, and some were not). A total of 469 BCBAs completed a series of questions about their use and belief in various interventions. The results showed that BCBAs reported using all sorts of interventions, including those without evidence of effectiveness. More specifically, even though the majority of the respondents reported using applied behavior analysis (ABA), discrete trial teaching (DTT), and the Picture Exchange Communication System (PECS), many also reported using Floortime, Auditory Integration Training, Facilitated Communication, and Gentle Teaching, which is particularly concerning since they are based on a different conceptual perspective (worldview) of behavior and have little to no empirical evidence for their effectiveness. These respondents were also asked about their "beliefs" in whether or not the treatments were effective and to what extent that belief influenced use. At least some BCBAs admitted using treatments even though they believed those treatments (e.g., sensory integration, floor time, facilitated communication) were not supported by scientific evidence.

Zane and Ellis (2014) reached similar conclusions through an Internet search for BCBAs who practiced fad treatments such as Sensory Integration, Relationship-based therapies, and Facilitated Communication. In searching for various combinations of "BCBA and [name of fad treatment)," Zane and Ellis found many BCBAs who advertised themselves as using or advocating for these types of treatments for which there are no supportive research, such as holistic therapy, Sensory Integration Training, Cranio-sacral therapy, and Relationship Development Intervention.

More recently, Schreck et al. (2016) pursued the reasons for drifting from a worldview built on the philosophy of radical behaviorism. A total of 848 certified behavior analysts including Board Certified Associate Behavior Analysts (BCaBA), BCBAs, and doctoral-level BCBAs (BCBA-D) were surveyed about the extent to which they used a total of 22 various treatments (evidenced-based or not). Schreck and colleagues found that respondents at each level of training (i.e., BCaBA, BCBA, and BCBA-D) reported using some treatments that were evidenced-based, and ones for which there was no evidence. For example, some BCaBAs reported using ABA, DTT, PECS, Floortime, and sensory integration. Some BCBAs reported using ABA, DTT, PECS, Floortime, Son-rise, Facilitated Communication, and Rapid Prompting Method. Some BCBA-Ds reported using ABA, sensory integration, music therapy, Facilitated Communication, and rapid prompting. It was clear that behaviorally-trained interventionists were using treatment methodologies that were inconsistent with behavior analytic training and a radical behaviorism worldview.

Schreck and colleagues (2016) also asked why such treatments were used, analyzing various potential antecedent and consequent factors that might have been influential in leading certified behavior analysts to use and recommend various treatments. Many respondents reported that training in ABA and science, research methodology, and evidenced-based decision making factors influenced their use of ABA and other scientifically-supported methodologies. However, when responding to the same questions regarding the use of treatments that had no or little empirical support, the respondents mentioned a number of influential factors. For example, between 61% and 68% of the surveyed certified behavior analysts said they were influenced to use Floortime and music therapy by their supervisor in their supervised fieldwork experience. Another 55% of BCBAs admitted using Floortime due to its popularity, and 70% of the respondents noted that persuasion from colleagues, clients, and/or parents influenced their use of ineffective treatments. A total of 59% of surveyed BCBAs reported using the Son-rise program due to an a priori belief that it was an easy intervention to implement. Lastly, obtaining financial reimbursement was often noted as a factor related to the use of a treatment.

Schreck and colleagues (2016) emphasized their findings as a "wakeup call" for the field of behavior analysis. Notwithstanding the training focus of science (e.g., determinism, empiricism, parsimony) and research design, behavior analysts are influenced by a myriad of other factors such as, but not limited to, persuasion, effort involved in implementation, and financial contingencies, even when these conflict with the evidence (or lack thereof) of the considered treatment. Schreck and colleagues strongly advocated for improved training in behavior analysis, including research design, supervision, and to "thoroughly indoctrinate ... students into the criteria for ABA and what constitutes behavior analytic practice" (i.e., worldview; Schreck et al., 2016, p. 374).

The Behavior Analyst Certification Board (2020) also provides evidence of the existence of a drift from a radical behaviorism worldview within practice by permitting BCBAs to use treatments not supported by scientific research. First, the BACB Ethics Code for Behavior Analysts (2020) section 2.01 states: "Behavior analysts implement nonbehavioral services with clients only if they have the required education, formal training, and professional credentials to deliver such services" (p. 10). Additionally, certified behavior analysts can advocate for and implement nonbehavioral strategies if they use a disclaimer in their marketing materials. Specifically, the Behavior Analyst Certification Board code of ethics states,

> *Behavior analysts do not advertise nonbehavioral services as behavioral services. If behavior analysts provide nonbehavioral services, those services must be clearly distinguished from their behavioral services and BACB certification with the following disclaimer: "These interventions are not behavioral in nature and are not covered by my BACB certification." This disclaimer is placed alongside the names and descriptions of all nonbehavioral interventions. If a behavior analyst is employed by an organization that violates this Code standard, the behavior analyst makes reasonable efforts to remediate the situation, documenting all actions taken and the eventual outcomes. (Behavior Analyst Certification Board, 2020, Section 5.06, p. 16)*

Therefore, a board certified behavior analyst can provide any therapy/intervention (e.g., astronaut therapy, Floortime, Social Thinking) as long as they state they are not doing so under their board certification. This loophole (Schreck et al., 2016) may preclude the certified behavior analyst from behaving skeptically by analyzing an intervention based on a radical behaviorism worldview and result in the selection of interventions based on other factors (e.g., persuasion, monetary).

It should be noted that observation of drift is not new within the field of behavior analysis. For instance, Branch and Malagodi's (1980) paper entitled, "Where have all the behaviorists gone?" noted, "It wasn't so long ago that the spark of commitment to behaviorism glowed brightly. That spark is barely visible these days as repeated Mentalistic micturitions have dampened it. Mentalistic psychologists, against whom we were once so squarely pitted, have outwitted us" (p. 36). Pierce and Epling (1980) discussed the influx of other professionals in the field and that "These people bring with them many non-behavioral practices and concepts, and because of their large numbers become influential in redefining the field" (p. 4). Finally, in his presidential address to ABA in 1980, Jack Michael noted, "the bad news is that many people working in the applied field no longer have a strong background or much interest in the science of behavior, nor have an understanding or commitment to behaviorism" (p. 11).

In this paper we suggest that behavior analysts' use of nonbehavioral treatments is related to maintaining worldviews other than a radical behavioral one, and other worldviews can become problematic to behavior analysts who are trained in the worldview of science and radical behaviorism. We further assert that the scientific worldview is the only worldview behavior analysts should possess and under which they should operate professionally. The purpose of this paper is four-fold.

First, we define worldview, describe what control a worldview exerts over how one views the world in which we live, and how a worldview dictates how we interpret the world and, in the case of behavior analysis, behavior. Second, we outline a radical behaviorist worldview, and explain how that worldview allows us to conceptualize behavior, as well as its assessment and treatment, in a particular way. Third, we provide examples of worldviews that may be incompatible or conflict with one of radical behaviorism, and discuss how those worldviews dictate methodological practices for assessing, explaining, and influencing behavior which are opposed to radical behaviorism and less effective due to a lack of the scientific foundation of radical behaviorism. Fourth, we make the case that behavior analysts – who, by definition, have studied behaviorism - should be ruled by the worldview of radical behaviorism in their work.

In this paper, we contend that to be maximally effective, behavior analysts who are trained in behavior analysis should subscribe to a radical behaviorist worldview and all that that means. Our intent is not to criticize other worldviews or their fundamental principles. Indeed, some worldviews can positively inform and influence the practice of behavior analysis. In a notable example, Malagodi (1986) discussed 10 ways in which Cultural Materialism is compatible with a behavior analytic worldview (e.g., "...it [Cultural Materialism] views selection by consequences as the principal mechanism for social organization and change..." p. 12). Developmental psychology provides another example. Don Baer argued that the two fields, behavior analysis and developmental psychology, can be similar and, thus, benefit one another (Morris et al., 1982). Also consider the field of neuroscience. This body of knowledge is directly useful to behavior analysis, and there is strong evidence that information from both fields might very well result in increased understanding of behavior and innovative ways in which behavior can be modified not considered even a decade ago (see Schneider, 2012 for a review). Indeed, Thompson (2007) powerfully asserted that behavior analysis must end the 'biological-behavioral' distinction and begin to incorporate systems inside the skin (e.g., nervous, cardiovascular, immunological) into analysis of behavior. These, and other, worldviews are compatible and may augment understanding and

the discussion within this paper is not in conflict with those circumstances. Instead, this paper is concerned with how clarity and efficacy may be compromised by competing worldviews.

*What is a "Worldview?"*

The word "worldview" comes from the German word weltanschauung, which combines welt, meaning world, and Anschauung, meaning view or outlook. Phrases such as, fundamental cognitive orientation, point of view, and how to look at the world and understand it, provide other nomenclature to the definition. A worldview is a particular stance or perspective that one has about a topic or concept, which then dictates how one views, talks about, and acts towards that topic or concept. Rachlin (1980) described a worldview as an outlook on life which explains how and why we think and behave. Morris (1988) wrote that worldviews give us "...criteria for evaluating meaningful research questions, appropriate research strategies, acceptable explanations for empirical findings, and adequate theories of development in general" (p. 290). Essentially, a worldview provides a lens through which we interpret the things that go on around us. The worldview dictates certain assumptions about explanatory causes for the phenomena being studied, and then how to impact or influence those phenomena. Behaviorally, a worldview may be conceptualized as a set of contingency-specifying stimuli that govern the behavior of an individual. For example, research documenting experimental control may function as a reinforcer for behavior analysts and thus behavior analysts may engage in behavior that is more likely to produce access to studies and other information that produce such reinforcers. As such, one's worldview helps to determine the methods and procedures one uses to study a phenomenon as well as the interpretation of the results of a study. For example, medical physicians view behavior problems as essentially medical ones; the medical model is the worldview, the lens, through which they view a problem; this worldview then also dictates assessment and treatment. In summary, a worldview is a frame of reference that sets parameters on how to view a phenomena, approach the study of that phenomena, and how to impact that phenomena. Strategies and tactics flow from the respective worldview.

What is the Worldview of Behavior Analysts?[1]

Malagodi (1986) stated, "Many of Skinner's major theoretical works (Skinner, 1948, 1953, 1954, 1957, 1968, 1969, 1971, 1972, 1974, 1978), taken together, may be conceptualized as comprising a 'worldview' (cf. Michael, 1980) that integrates scientific philosophy and behavior principles into an epistemologically consistent general theory of human behavior" (p. 1). The worldview to which Malagodi was referring is often termed behaviorism or radical behaviorism, and is the worldview of behavior analysts. In Skinner's (1963) own words, "Behaviorism...is not the scientific study of behavior but a philosophy of science concerned with the subject matter and methods of psychology" (p. 951). Behaviorism, then, is a philosophical position in which science is the foundational influence of how behavior is to be studied. Note the strong influence of a scientific perspective. Neuringer (1991) described behaviorism as "...associated with the philosophical position of determinism. Behaviors are hypothesized to be functionally related to events, with those events external to the behaving organism most helpful in predicting and controlling behavior." (p. 9). Lastrucci (1967) was careful to point out that the word science connotes content and methodology; his definition of science was "...an objective, logical, and systematic method of analysis of phenomena, devised to permit the accumulation of reliable knowledge." (p. 6). Sagan (1996) referred to "... a 'way of thinking'" (p. 25). So, our worldview of behaviorism is a philosophical and technological one.

Heward and Cooper (1992) stressed the guiding assumptions of science (and of behaviorism) to be determinism and empiricism. Cooper et al. (2020) offered this definition of science:

> *a... systematic approach to the understanding of natural phenomena – as evidenced by description, prediction, and control – that relies on determinism as it fundamental assumption, empiricism as its prime directive, experimentation as its basic strategy, replication as its necessary requirement for believability, parsimony as its conservative value, and philosophic doubt as its guiding conscious (p. 7)*

When practicing science, one adheres to the attitudes and characteristics of science. Common attitudes and characteristics are determinism, empiricism, experimentation, replication, parsimony, and philosophic doubt (Cooper et al., 2020). These principles translate into the practices that have come to be known as a behavioral approach toward the study of behavior – an adherence to operationally defining the subject matter, precisely measuring the behavior of interest, relying on experimentation to determine causal relationships between variables and behavior, and practicing philosophic doubt, which essentially means to believe in the data, even if it means changing one's position on beliefs, if new data challenges those beliefs.

To what extent, then, is science and the scientific worldview related to ABA? Skinner (1938) laid out the basic principles and practices of his new science and how it would be applied to the study of behavior. Baer et al. (1968, 1987) captured, for all time, the meshing of the two (i.e., science and ABA) in the dimension of conceptual consistency. Vargas (2004) went further, asserting that behavior analysis is a science in and of itself. Cooper et al. (2020) supported this view describing ABA as "...a science devoted to the

understanding and improvement of human behavior" (p. 2) and noted that other fields of study also have the goal of improving behavior. However, Cooper and colleagues described behavior analysis as different due to its reliance and adherence to a scientific approach toward the study of behavior. Any behavior analyst who has studied the field should have learned about the scientific approach.

Skinner (1963) was clear – behaviorism is the philosophy of science concerned with the study of behavior. Behaviorism is the connecting empirical epistemology (Skinner, 1963); it dictates what we study and how we study it. In other words, the philosophy of science that is behaviorism dictates the dimensions of what is studied (i.e., the properties of behavior) and the methods used to study them. This worldview has two major impacts. First, it concentrates behavior analysts' focus on studying behavior qua behavior (i.e., for its own sake). This contrasts to studying behavior as a symptom indicator of some internal event that is, purportedly, the higher priority of study. The second impact comes in the form of informing behavior analysts where to look for the influences on behavior. This worldview dictates an assumption that behavior is a direct function of environmental variables occurring in temporal contiguity with the behavior. This worldview, then, dictates assessment and treatment. Behaviorists focus on environmental variables (preceding and following the behavior of interest) and their functional relationship with the occurrence or nonoccurrence of a targeted behavior.

Thus, the radical-behavioristic worldview informs and influences the methods used when assessing and attempting to change behavior. There are many examples of this within the broad field of behavior analysis. For example, Heward and Cooper (1992) discussed innovative approaches in education stemming from our philosophy. They noted that there have evolved several behaviorally based educational systems, such as Precision Teaching (Lindsey, 1991), Programmed Instruction (Keller, 1968), and Comprehensive Application of Behavior Analysis to Schooling (CABAS; Greer, 1991). These approaches toward educational practice stem from the worldview of behaviorism and science. Similarly, assessment and treatment procedures for use with individuals diagnosed with intellectual and developmental disabilities, including autism spectrum disorder (ASD), have evolved from a scientific worldview. For example, this unique behavioral worldview formed the foundation and practice of functional analysis of problem behavior (e.g., Carr & Durand, 1985; Iwata et al., 1982/1994; Lovaas & Simmons, 1969) as well as descriptions of strategies to prevent the development of problem behavior altogether (e.g., Ala'i-Rosales et al., 2019). This worldview has led to many behaviorally-based treatments for individuals diagnosed with ASD, including, but not limited to, discrete trial teaching (e.g., Lovaas 1987; Smith, 2001), noncontingent reinforcement (e.g., Vollmer et al., 1993), and peer tutoring (e.g., Kamps et al., 1994). Skinner's (1957) conceptualization of language is part of this as well, leading to effective procedures in that area of human development. Lastly, a vast number of behavior analysts are working in business and industry, implementing behavioral safety' approaches to managing occupational hazards and risks of injury in factories and industry. This approach is built upon the fundamental worldview of behaviorism and science, and has proven extremely effective (e.g., Austin et al., 1996; Geller, 2005; Greene et al., 1987), similar to most other areas of application of interventions emerging from our worldview.

In sum, behavior analysts view behavioral phenomenon through the radical behaviorist lens when analyzing and changing behavior. The radical-behavioral worldview governs the actions of behaviorists in ways that are consistent with the assumption that behavior is a function of observable and measurable environmental variables. Once one adopts this worldview, it excludes explanations that are incompatible with that assumption and influences the assessment (i.e., searching for a functional relationship between antecedent/postcedent variables and behavior) and treatment/intervention practices (i.e., changing the relationship between behavior and environmental variables). Thus, behavioral practices are informed by, and are consistent with, this worldview. Traditionally, behavior analysts have come from a large number of disciplines including education, special education, psychology, social work, speech and language, counseling, business, and basic experimental analysis of behavior (Foxx, 1996). Nevertheless, behavior analysts are all bound together by this worldview consisting of foundational principles, conceptual underpinnings, and clinical practices.

**Different Worldviews of Behavior**

Throughout the history of humankind, there have been many attempts to explain the world and human behavior. Many religions offer explanations for behavioral and other phenomena. For example, people who practice the religion of Christian Science (Christian Science, 2018) believe in God's word in the form of the Bible. The content outlined in the Bible, as well as other materials, comprise a set of beliefs (i.e., worldview) that directly impacts how Christian Scientists interpret and lives in the world. They believe in the One Christ, Jesus, being the son of God. Proponents of this religion have faith in the power of the Holy Spirit (Christian Science Committees on Publication, 1959). A fundamental belief is that everything originates with God and since God is perfect, humans cannot really and truly be injured, have mental health challenges,

or be ill (Squires, 2018). Their claim is that since God is all powerful and can directly impact our lives on a daily basis, simply putting a person with an illness or injury into "God's hands" will result in God healing of that person (Michell, 2014). Specifically, proponents of this worldview avoid medical treatment for illnesses and injury because disease can be healed spiritually (Wardell, 1965) without any supplementary implementation of medicine based on science; however, a recent contemporary view of some is that practitioners may make their own personal decisions about whether or not to consult medical professionals (Paulson, 2014).

Another worldview can be found in the field of psychology. Consider the area of psychodynamic (psychoanalytic) psychology or mentalism. This worldview is conceptualized as the existence of internal phenomena that either completely or partially explain behavior (Sober, 1983). To put it another way, a mentalistic worldview assumes that internal events, unavailable for detecting, observing, or measuring, are not only causally related to behavior, but that failing to incorporate these inner constructs provides a woefully inadequate account of behavior-environment relations (e.g., Flanagan, 1984). These internal (mental) states influence one's view of why behavior happens (Smithies, 2012). Thus, the subject matter in a mentalistic/psychodynamic psychology consists of hypothetical constructs (see MacCorquodale & Meehl, 1948 for a discussion) that are unable to be observed (e.g., Ainsworth, 1969), but are assumed to exist based upon the verbal reports (i.e., introspection) of the individual being treated. The concept of intrinsic motivation (e.g., Ryan & Deci, 2000), as opposed to extrinsic motivation (commonly associated with positive reinforcement in the behavioral sense), is associated with a mentalistic approach. Assessment frequently takes the form of verbal dialog between patient and care provider, or by observing parent-child interactional patterns (e.g., Greenspan & Porges, 1984).

Another worldview that provides a conceptualization of behavior, and subsequent assessment and treatment based upon that conceptualization, is Sensory Integration (SI) theory (Ayres, 1972; 2005). The basic assumption of this theoretical model emphasizes the importance of the sensory system and how it processes incoming environmental stimuli (e.g., tactile, vestibular, proprioceptive). If the sensory system is normal and functioning properly, an individual reacts adaptively. However, if there is dysfunction in the processing of stimuli, the results can manifest in many ways, such as learning, behavior, or speech disorders (e.g., Blanche et al., 2016; Schaaf & Miller, 2005). To improve the sensory functioning, there must be an abundance of the right type of sensory activity to improve the nervous system, to allow it to process stimulation appropriately, with the result of a reduction or elimination of behavior or learning problems (Lang et al., 2012). This conceptualization of behavior leads to very specific assessment and treatment protocols. If the worldview dictates that behavior is a function of sensory processing, then assessment of a behavioral situation must focus on the sensory capabilities of the individual (e.g., Ayres, 1972; Dunn, 2002). For example, Ayres developed the Sensory Integration and Praxis Tests to assess an individual's ability in performing a variety of visual, tactile, kinesthetic, and motor tasks (Kimball, 1990). In addition, very specific treatment strategies emerge from this unique conceptualization. Specifically, sensory-rich activities must be provided, such as swinging, brushing, wearing weighted vests, and adaptive seating (e.g., Bagatell et al., 2010; Fertel-Daly et al., 2001).

Because of the different conceptualizations of behavior across different worldviews, we assert that worldviews that include an alternative conceptualizations of behavior are incompatible with a radical behaviorist worldview and, thus, problematic as it relates to the practice wing of the field. For example, as previously noted, a mentalistic worldview assumes the existence of inner constructs or variables that produce overt behavior. Skinner (1954) referred to these constructs as explanatory fictions, an apt term because, due to their undetectability, one must assume that these exist and then assume that they are somehow accountable for behavior. That particular belief is not part of the scientific enterprise that behavior analysts learn, should learn, or use to influence practice. Instead, the behavioral training to which all behavior analysts should have been exposed should lead to the acceptance of the conceptualization of direct environment-behavior relations, which is consistent with the application of science to any field of study.

Since mentalism injects into the analysis of behavior entities such as schemata, cognitions, and the spiritual, the mentalistic worldview explaining and approach toward the study of behavior is contradictory to the scientific behavioral worldview. The sensory integration worldview of behavior is also incompatible with the fundamental beliefs and tenets of behaviorism. As noted previously, a sensory worldview is predicated on the assumption that behavior is a function of an intact biological organism that integrates external stimulation and internal processing, resulting in adaptive functioning. When there is a dysfunctional nervous system, the processing of sensory input is disrupted, resulting in behavior and learning disorders (Ayres, 1972). The conceptualization of behavior from a sensory perspective does not acknowledge the influence of environmental variables on behavior. The sensory worldview does not adhere to basic attitudes and characteristics of science in studying phenomena that are observable and measurable. The core beliefs

of a sensory approach toward behavior does not rest on behavioral or scientifically proven principles.

*How Competing Worldviews Affect Practice*

The question is not, "Does maintaining a competing worldview affect practice?" Rather, the question is, "How does maintaining a competing worldview affect practice?" That is, it goes without question that attempting to hold a competing worldview comes with some compromises. What is likely to be of most interest to the practice wing of our field is how these compromises may affect decisions related to the selection and application of interventions. In our view, the effects are systemic and detrimental to the practice of behavior analysis.

*Endorsing Evidence-Based Practices*

As previously stated, a behavior analytic worldview is rooted in the tenets of science (e.g., determinism, empiricism, experimentation, replication, parsimony, philosophic doubt). With behaviorism rooted in science as the sole worldview, the practicing behavior analyst stays true to philosophic doubt and empiricism, decreasing the likelihood of recommending, endorsing, advocating, and/or implementing procedures/interventions without empirical support and/or with limited to no evidence. Simultaneously maintaining a competing worldview (e.g., astrology) can result in the endorsement and/or implementation of procedures with little to no evidence to their effectiveness (e.g., Social Stories™), that are pseudoscientific (e.g., Social Thinking or Floortime), or have the hallmarks of anti-science (e.g., Facilitated Communication, Rapid Prompting Method). Unfortunately, some behavior analysts are currently recommending, endorsing, and/or implementing these types of interventions (Shreck et al., 2016). Some of the rationales provided for doing so has included the need for behavior analysts to work collaboratively with other professionals (Brodhead, 2015; Kirby et al., 2021, that it does no harm, or to appease the requests of parents and other caregivers. These rationales are indicative of the conflict between worldviews. Despite the rationale, selecting interventions with little or no evidence for effectiveness is likely to result in a less effective course of action by the behavior analyst. More effective, behaviorally based interventions could be delayed, or, worse, avoided altogether. Furthermore, providing a disclaimer that it does not fall under the scope of certification (i.e., BCBA) is a certification and practice solution, but it does not solve the core issue of distancing oneself from the fundamental behavioral worldview. However, it is important to note that the BACB does not certify worldviews; one is a behavior analyst or one is not. A disclaimer cannot negate a worldview – it simply ignores it.

**Causal Relationships**

Within a behavior analytic worldview, an individual's behavior is a product of/influenced by environmental-behavior relations. In the case of respondent, or reflexive, behavior, responses are elicited by an antecedent event (commonly referred to as an unconditioned or conditioned stimulus). In the case of operant behavior, responses are evoked (i.e., an increase or decrease in probability) by antecedent events and strengthened (i.e., through reinforcement) or weakened (i.e., through punishment or extinction) by consequent events. All of these behavior-environment relations occur in the environment and observable, objectively measured events and behavior are used to determine functional relations and inform interventions. Therefore, the practicing behavior analyst with this worldview identifies causes of behavior in the environment and not in other non-observable events or stimuli (e.g., alleged sensory systems or processing centers in the brain, absence of social connectedness with a parent).

Attempting to maintain a worldview with a competing conceptualization of behavior (e.g., Sensory Integration theory), can result in the behavior analyst placing cause in other places. Identifying causes of behavior antithetical to a behavior analytic worldview will inevitably affect the selection of an intervention. For instance, if one presumes a behavior is a result of a dysfunction in the processing of stimuli, then a processing-oriented intervention may be selected to address this dysfunction. This intervention would be in direct conflict with a behavior analytic conceptualization of behavior outlined by a behavior analytic worldview. Worse still, and perhaps most importantly, treatments based on these incompatible worldviews are likely to be less effective than the treatments developed as a result of a radical behaviorism worldview that have proliferated and have been vetted to be effective.

*One Worldview Across One's Professional Practice*

Foxx (1996) asserted that once a behavior analyst commits "...intellectually to behavior analysis..." (p. 147), then that person has a responsibility to behave in adherence to the worldview espoused by the science, philosophy of radical behaviorism, and all that that entails. Foxx argued that behavior analysts have a responsibility to behave in a way that will promote that science and philosophy, and act in ways to maximize its survival in the culture. Palmer (personal communication, May 27, 2018) put it succinctly – "...once you buy into the assumption, it excludes explanations that are incompatible with that assumption."

Skinner asserted that neither science or a philosophy of behavior can or should include or reference the existence of hypothesized internal constructs or processes inside the organism that would be used to account for behavior (Harnad, 1988). This influences

how a behavior analyst would observe, study, and attempt to account for a particular behavior emitted by a specific individual. For example, a behavior analyst observes a person in a casino, an account of why such a person behaves as they do would not consider compulsions, drive states, or needs. Instead, one would look to the immediate environment and also learn about the person's history of reinforcement and punishment to explain current behavior patterns. Behavior analysts adhering to a radical behaviorist worldview behave according to the latter and not the former.

Stoneman et al. (2013) addressed incompatible worldviews in medicine, specifically that of conventional medicine and Complementary and Alternative Medicine (CAM). Conventional medical approaches are based upon strong science, in terms of its conceptualization of human health, as well as the assessment of health problems and the treatment of them. In contrast, CAM is a catch-all term meaning medical treatments that have not been fully vetted empirically. Stoneman and colleagues noted that although some CAM therapies have been shown to be effective (e.g., massage), most of the treatments in this group are considered ineffective, faddish, and sometimes dangerous. Stoneman and colleagues asserted that these two approaches are "fundamentally incompatible" (p. 5) with no unifying conceptualization of health and illness, and no compatibility among the methods used to approach healing. As they note, "One either follows the strictures of science and of evidenced based medicine, or one does not" (Stoneman et al., 2013, p. 5).

A behavioral worldview is based upon the pillars of science and scientific practice. Other worldviews providing conceptualizations of behavior may not have such a strong orientation to science. One cannot easily embrace a scientific worldview on one day while practicing ABA and then a nonscientific one on another day while practicing an alternative approach. Such behavior must be explained. One possibility might be that this behavior analyst never obtained adequate training during their coursework to develop a thorough understanding of a radical behaviorist worldview, which may result in a lack of appreciation of its potential. If this is the case, then efforts to improve graduate training programs and working with those who approve those training programs and those who accredit those training programs may be fruitful. Another possibility might be that the reinforcers and punishers associated with the contingencies for maintaining a radical behaviorist worldview have not been conditioned. For example, if experimental control, objective and observable dependent variables, and studying behavior for behavior's sake have not been conditioned as a reinforcer it is likely that the practicing behavior analyst will be less likely to behave in ways that increase the likelihood of accessing those outcomes. A third explanation might be that competing contingencies are resulting in jumping from one worldview to another (and changing treatment approaches to coincide) based upon maximizing reinforcers. For example, there may be financial incentives for providing treatment that involves an intervention that does not align with a behavior analytic conception of human conduct. Although maintaining a behavior analytic certification, a practicing behavior analyst may, in these cases, behave in ways to access monetary reinforcers while sacrificing effectiveness and science-based decisions making. A behavior analyst who disregards a behavioral worldview for a different, nonscientific one, probably does not accept that behavioral principles are, in fact, true principles. You either believe that cheese comes from milk, that Miami is in Florida, that the earth is sort of round, or you do not; there is no middle ground (D. Palmer, personal communication, May 27, 2018).

### *I Have More Than One Worldview, Now What?*

At this point, readers considering themselves behavior analysts may be reflecting on their own worldview(s) and whether their professional practice is impacted by incompatible worldviews. What are readers to do if they are attempting to maintain one or more worldviews in addition to that of radical behaviorism? While the adherence to more than one worldview might be possible under some conditions, there are some inherently incompatible perspectives that cannot be comingled. Worldviews that consist of fundamentally opposed perspectives on the nature of behavior, and, as a result, about the selection of intervention cannot co-exist. For example, in the realm of autism intervention, it is not possible to support both a behavior analytic conceptualization of intervention and a sensory integration approach to treatment. Perhaps the most important question readers should ask themselves is, "Does the worldview provide an alternate conceptualization of behavior?" If the answer to this question is "no," although it is not ideal, it may be possible to maintain this worldview in addition to radical behaviorism. If the answer is "yes," that worldview may need to be abandoned completely to ensure effectiveness. That is, treatment approaches based on a radical-behavioral philosophy have been shown to be more effective than treatments based upon other worldviews. Readers must ask how thoroughgoing of a behavior analyst does one want to be and will a less-than-thoroughgoing behavior analyst result in less effective practice and cause problems for the field at large?

## Conclusion

The purpose of this paper was to provide rationales for a recommendation that practicing behavior analysts should adopt one, and only one, worldview to influence and guide their conceptualization of behavior and practice. That worldview, of course, is rooted in natural science and the application of science to the study of behavior. There are multiple worldviews that provide alternate conceptualizations of behavior. Some may be attractive. The strategies and tactics suggested by other worldviews may be compelling and appealing in an intellectually-stimulating way. Some behavior analysts may choose to implement interventions that stem from different worldviews due to financial or other contingencies (such as persuasion or a misunderstanding of research design and evidenced-based decision making). However, to do so would require drifting from the conceptualization of behavior espoused by Skinner, Watson, Baer, Wolf, Risley, and many others. The behavior analytic worldview has led to incredible advances in the assessment and treatment of a vast array of behavior problems across all areas of human endeavor. The practical strategies stemming from this worldview work, and work well. Adhering to a worldview that attempts to explain the origins of behavior differently from the scientific one is intellectually dishonest and is likely to be less clinically effective. One cannot truly believe that incompatible worldviews can both be correct. If we do not hold to that perspective and worldview, then we never really believed in it in the first place.

**Footnotes**

[1]It is not our intent to provide an exhaustive review of the definition of behavioral philosophy or worldview. There are many publications that do this in a very thorough and scholarly way (see Morris, Smith, & Altus, 2005; Moore, 2008; Skinner, 1938; 1974, to name a few). Instead, our aim is to provide a sufficiently detailed definition that orients the readers to the basic philosophy and parameters of the worldview of applied behavior analysis.

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# The Crossroads: Interdisciplinary Teams and Alternative Treatments

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## Abstract

Behavior analysts collaborating within interdisciplinary teams are likely to find themselves at difficult crossroads. Some of these crossroads include implementing alternative treatments, defining and determining risk and harm, and evaluating research and interventions. The purpose of this paper is to highlight some of these crossroads and provide guidelines on successfully navigating them. We contend that it is possible to navigate these crossroads while minimizing harm or risk for the client, adhering to the principles of science and behavior analysis, and remaining respectful of all members of the interdisciplinary team. That is, we can maintain the scientific tenets of philosophic doubt, empiricism, and experimentation, while remaining humble, and ensuring our clients access the most effective interventions available.

**Keywords:**

Alternative Treatments, Collaboration, Evidence Based Practice, Autism

## Introduction

Behavior analysts value effective collaboration with professionals within and across different disciplines and with our consumers. As Kelly and Tincani (2013) stated, "There is no standard operational definition for collaboration..." (p.121). Despite this, behavior analysts have continued to discuss collaboration with interdisciplinary teams within the peer-reviewed literature (e.g., Bowman et al., 2021; Kelly & Tincani, 2013; LaFrance et al., 2019). Across the behavior analytic literature on collaboration with interdisciplinary teams, there appears to be consensus that to effectively collaborate, behavior analysts should engage in a multitude of behaviors, including: (a) joint problem solving, (b) recognizing the strengths of other members of the interdisciplinary team, (c) active listening, (d) engaging in good communication amongst team members, (e) having a universal and agreed upon code of ethics, (f) not engaging in disciplinary centrism, and (g) not being judgmental (e.g., Bowman et al., 2021; Brodhead, 2015; Cox, 2012; Galloway & Sheridan, 1994; Hall, 2005; Kelly & Tincani, 2013; LaFrance et al., 2019; Lawson, 2004). For collaboration to occur, "It is imperative that all members of a team recognize their own knowledge limitations and value the expertise afforded by *professionals* who have

been trained in other areas" (LaFrance et al., 2019, p. 710). Additionally, all members of the team need to value maximizing benefits while minimizing any potential harm. An interdisciplinary team should: (a) develop shared goals, (b) develop interventions jointly, (c) develop data tracking methods, and (d) set a plan for communication (Newhouse-Oisten et al., 2017).

Cox (2012) discussed the importance of a united set of ethical principles that provides common ground amongst professionals in an interdisciplinary team. These common ethical principles and obligations for interdisciplinary autism interventionists included: (a) beneficence, (b) nonmaleficence, (e) respect for persons, and (d) professional commitments. These principles were provided to help ensure competence and define acceptable behaviors, so all members of the interdisciplinary team are held to a high standard from the outset. Brodhead (2015) created a decision-making model to help behavior analysts determine if a nonbehavioral treatment would put the client's safety at risk, how to navigate with colleagues if the client's safety is at risk, and how the behavior analyst can navigate with colleagues if the client's safety is not at risk. This decision-making model can be useful to help behavior analysts navigate if they should address concerns about alternative treatments with outside colleagues.

Bowman and colleagues (2021) expanded the tools available for behavior analysts working on interdisciplinary teams by outlining standards for interprofessional collaboration when providing intervention for autistics/individuals diagnosed with autism spectrum disorder[1] (ASD). These standards included: (a) collaborative communication, (b) roles in collaboration, (c) what the roles are for individuals within the organization, (d) ensuring quality client care, (e) ways to resolve conflict, (f) creating joint partnerships across professionals, and (g) best ways to ensure appropriate treatment approaches across disciplines. Finally, Kirby and colleagues (2022) described a framework to help guide behavior analysts to develop skills to advance and maintain professional relationships when working in an interdisciplinary team, specifically with respect to cultural reciprocity. The framework included skills such as self-reflecting, listening, validating, and compromising.

The ethical codes for which certified behavior analysts are bound also place value on and promote collaboration. For example, the Board-Certified Behavior Analyst (BCBA) code of ethics for BCBAs specifically notes that behavior analysts are to collaborate with others in the best interest of clients and stakeholders (Behavior Analyst Certification Board, 2020). Further, the Behavior Analyst Certification Board (BACB) code of ethics for BCBAs states that any conflicts should be addressed "by compromising when possible and always prioritizing the best interest of the client" (Behavior Analyst Certification Board, 2020, p. 11). The International Behavior Analysis Organization's (IBAO) ethics code (International Behavior Analysis Organization, 2021) directly states "certificants participate in collaborative relationships with professionals in other disciplines and treatment teams, prioritizing the client's best interest" (p. 8). The recently developed Progressive Behavior Analyst Autism Council (PBAAC) ethics code (Progressive Behavior Analyst Autism Council, 2022) also highlights the importance of collaboration and states, "The CPBA-AP works collaboratively with other professionals to serve their clients effectively within the context of providing only evidence-based procedures/interventions" (p. 3).

The numerous benefits of effective collaboration have been long discussed in the literature. For example, Lawson (2004) stated that effective collaboration could better enhance problem solving. Hall (2005) concluded that effective collaboration could result in better outcomes for clients and that professionals will report higher job satisfaction. Galloway and Sheridan (1994) found that effective collaboration is preferred by clients, results in better treatment integrity, and leads to better maintenance of gains. Brodhead (2015) provided a decision-making model to assist behavior analysts navigate non-behavioral treatment recommendations by members of a treatment team to help maintain professional collaboration and help develop a better understanding of other approaches to interventions.

In addition to collaboration, behavior analysts have also placed value on the use of interventions that are effective, efficient, and conceptually systematic (Baer et al., 1968, 1987). As such, behavior analysts only implement, recommend, and endorse procedures that would be considered an evidence-based practice (EBP) and are empirically supported. Although promoting and only using EBPs and ensuring effective collaboration are core values of behavior analysis, sometimes these two values find a behavior analyst at a crossroads. For example, what does a behavior analyst do when providing services for a client in a clinic setting and an outside professional recommends a procedure for that client that may be harmful? What if a behavior analyst is working in a school setting, as part of an interdisciplinary team, and an outside professional recommends an intervention that will not cause physical harm to the learner but has been proven ineffective in the empirical research? What if a behavior analyst, who is also a researcher, is attending a conference where presenters are touting misinformation about behavioral intervention, while making inaccurate claims about their intervention? Should the behavior analyst remain silent or complacent with the alternative interventions, make compromising statements (e.g., "That is fine as long

as we use progress monitoring data to evaluate the decision"), or critique those interventions based upon the universal concepts of science and research but risk being ostracized from the interdisciplinary team or accused of lacking humility?

There are no easy answers to these questions, and the context as well as many other variables would likely influence possible answers and solutions. When the concepts of evidence based/alternative treatment and collaboration come to a crossroads, it is difficult for any behavior analyst to navigate the collaborative circumstances effectively. While there have been guidelines and tools created and discussed within the literature to help behavior analysts navigate these issues (e.g., Brodhead, 2015; Kirby et al., 2022), the guidance and tools likely reflect the authors' personal values (Brodhead, 2015) and more discussion and guidance is warranted. Thus, the purpose of this paper is to provide some guidelines for navigating collaboration within an interdisciplinary team.

*Some Crossroads*

As previously noted, there are several potentially difficult crossroads to navigate when collaborating as a behavior analyst on an interdisciplinary team. What follows are examples of three major crossroads related to EBPs and alternative treatments that are likely to occur when collaborating as a behavior analyst on an interdisciplinary team.

*Implementing Alternative Treatments*

The first crossroad with respect to navigating collaboration within an interdisciplinary team is that as a field relates to many certified behavior analysts implementing alternative treatments. Marshall and colleagues (2023) conducted a survey of doctoral level BCBAs (i.e., BCBA-Ds), BCBAs, Board Certified associate Behavior Analysts (BCaBAs), and Registered Behavior Technicians (RBTs) on the implementation of alternative treatments. The responses from 921 individuals were evaluated regarding the implementation of 30 different interventions that were categorized as: (a) effective (e.g., interventions based on the principles of applied behavior analysis), (b) interventions that have emerging evidence (e.g., Music Therapy), (c) interventions that have not been proven (e.g., Social Thinking™), and (d) interventions that can be considered ineffective and possibly harmful (e.g., Rapid Prompting Method). These categories were created using national standards that have been developed to evaluate autism interventions (National Autism Center, 2009, 2015). The results of the survey showed that bleach therapy was the only one of the 26 interventions that was categorized as either having emerging evidence, not established, or harmful, that was not reported as being implemented by the respondents (i.e., those certified by the BACB). As such, interventions such as Social Thinking™, hyperbaric oxygen chamber, and Relationship Development Intervention were reported as being implemented. Furthermore, 2.6% of BCBA-D respondents indicated that they implement Rapid Prompting Method. These results are concerning in that certified behavior analysts, who are ethically bound to the use of EBPs, are implementing alternative and dangerous interventions.

*Defining Risk and Harm*

Another crossroad that occurs when navigating collaboration within an interdisciplinary team is the lack of a comprehensive definition of harm or risk. Brodhead (2015) defined risk as "...as any treatment that will likely cause short- or long-term psychological or physical harm to the client" (p. 72). This definition is a great step in defining risk and harm, as it guides behavior analysts away from interventions that may cause psychological or physical harm. As such, behavior analysts should be less likely to implement interventions such as chelation or bleach therapy and more likely to avoid and advocate against their use within the interdisciplinary team.

Brodhead's (2015) definition of risk is a great start; however, we suggest that it should be expanded further to mitigate possible risk and harm for our clients. Specifically, we contend that there is harm and risk involved in spending valuable instructional time on ineffective alternative treatments. For example, Social Thinking™ is an intervention that is not empirically supported (Leaf et al., 2018; Leaf et al., 2016) and is considered as an unestablished intervention within the National Standards Project evaluating autism interventions (National Autism Center, 2015), but would not be considered a risky intervention or harmful based on Brodhead's definition. As a result, if a professional on an interdisciplinary team in a school setting recommends the implementation of Social Thinking™ for 30 min per day and this recommendation is implemented, it would result in the team implementing 5,400 min (i.e., 90 hr) of Social Thinking™ across an entire 180-day school year. That is 90 hr of instructional time that could have been spent on an intervention with documented effectiveness.

While 90 hr of instructional time may not seem significant, researchers have shown the tremendous outcomes that autistics/individuals diagnosed with ASD can make with even less time. For example, Leaf et al. (2017) demonstrated that participants of a behaviorally based social skills group that lasted a total of 64 hr resulted in the participants acquiring over 100 social and adaptive skills. The results also indicated significant improvements on standardized social and adaptive assessments. If there is agreement that there is harm and risk involved in spending valuable instructional time on ineffective alternative treatments,

behavior analysts must weigh that risk and harm with advocating against the use of alternative treatments and possibly eroding professional relationships, being removed from the interdisciplinary team, or not being labeled as a humble behaviorist (Kirby et al., 2022)

*Evaluating Research and Interventions*

Kirby et al. (2020) contended that "Disciplinary centrism within our field [behavior analysis] can also result in claims that programs designed by non-behavior analysts are unscientific and not supported by evidence when such practices do not readily fit within our behavior analytic model..." (p. 136). Kirby and colleagues further argued that "Hubris is at the core of the idea that if an intervention wasn't designed by a behavior analyst, it is not scientific nor supported by evidence" (p. 136). It is true that an intervention should not be considered not scientific or supported by evidence just because an intervention was not designed by a behavior analyst. Rather, an intervention is not scientific or supported by evidence if it does not meet well established standards in research and practice. As such, even interventions developed by behavior analysts can be classified as not scientific or supported by evidence if they have not met the criteria to be considered as such.

Kirby et al. (2020) also implied that the hallmarks of research and science are not universal and that behavior analysts cannot, or should not, evaluate non-behavioral research using well established standards in research and science. It should be noted that the value behavior analysts place on the use of single case designs was developed, in part, by evaluating and identifying the limitations of other common research methodologies (Sidman, 1960). The research methodology used by and advocated for by behavior analysts has resulted in numerous advances in the development of meaningful behavior and amelioration of dangerous behavior (e.g., functional analysis; Iwata et al., 1982). It, therefore, seems reasonable and fruitful to evaluate research, behavior analytic or otherwise, using the tenants of behavior analytic research methodology (e.g., operationally defined and observable dependent variables, clearly described independent variables, interobserver reliability).

Relatedly, it is important to note that threats to internal and external validity go across various disciplinary research. Thus, threats of maturation, history, testing, instrumentation, regression, selection, or mortality within research exist across disciplines (e.g., psychology, occupational therapy, behavior analysis) and researchers (e.g., behavior analysts, speech language pathologists, occupational therapists). Additionally, while some research designs are more common (e.g., single case designs within behavior analysis) and less common (e.g., pre-test post-test control group designs within behavior analysis) within different disciplines, no field can lay claim to one or more designs. Rather, the research design should be selected based on what best answers the experimental question and that design should be implemented as designed to ensure as much experimental control as possible. Just as the possibility of threats to external and internal validity are not unique to any discipline's research, the hallmarks of science, pseudoscience, and anti-science (Green, 1996) are not concepts that belong to the field of behavior analysis. Rather, they are universal concepts and principles that can be applied to any intervention or population demographic.

*Listening and/or Following*

The topic of listening is not new within the behavior analytic literature, but much of that literature is discussing listening from a verbal behavior perspective (e.g., Hayes, 1996; Schlinger, 2008). Recently, the topic of listening within the literature and other outlets (e.g., social media) has shifted to listening to consumers of applied behavior analysis (ABA) interventions and autistic advocates. It should be noted, however, that listening to consumers has been a hallmark of ABA for many years (i.e., Wolf, 1978). Discussing listening from a verbal behavior perspective is beyond the scope of this paper, but a crossroad many behavior analysts will find selves at while navigating an interdisciplinary team is what does it mean to listen. It appears that listening, in this context, does not necessarily mean agreeing or avoiding disagreement especially in situations in which risk or harm are likely (Brodhead, 2015). If this is the case, then a behavior analyst could listen to the recommendations of other members of the team, while still disagreeing and advocating for an alternative recommendation. However, some may contend that listening requires following as opposed to discourse, difficult discussions, and possible compromise. In these situations, not following may lead to being ostracized or accused of not listening to other members of the interdisciplinary team. When this is the case, the pathway forward for the team is often a rocky one.

*Navigating the Crossroads: Practitioners*

There is no doubt that challenges will arise for behavior analysts navigating the crossroads of collaborating with members of an interdisciplinary team and the implementation of alternative treatments. There have been some previous discussions within the literature to help provide guidance to behavior analysts in these situations (e.g., Brodhead, 2015; Kirby et al., 2022). What follows are some additional guidelines to navigate these crossroads for practicing behavior analysts. We, like others (e.g., Brodhead, 2015), acknowledge that the guidelines we offer are influenced by our professional and personal histories. Furthermore, we offer these as guidelines and encourage the reader

to view them as such (i.e., not apply them as rules to use across interdisciplinary teams as each team is likely to be unique and require the behavior analyst to use clinical judgement to address challenges as they arise). Thus, a behavior analyst/technician must evaluate their specific situation (e.g., environmental variables) when considering these guidelines.

*Determine Your Professional Values: The Implementation of Alternative Treatments*

One initial step any practicing behavior analyst should take is determining their personal values with respect to the implementation of alternative treatments. Said differently, which procedures are you comfortable or uncomfortable implementing? Some have conceptualized different interventions using a red, yellow, green system (e.g., Association for Science in Autism Treatment, n.d.; Autism New Jersey, n.d.; Weiss et al., 2022). Weiss et al. (2022) described each of these tiers as,

> *Green light treatments signal efficacy. Yellow light treatments are those that should be implemented with caution and need additional research regarding their potential impact. Red light treatments are those that have been proven to be ineffective and/or harmful and that should not be implemented (p. 143).*

More specifically, green light interventions are those that would be considered EBPs with documented evidence of their effectiveness. Yellow light interventions are those that may have emerging evidence, but are not EBPs, or those that may pose little risk or harm for the client and can be closely monitored and altered quickly if necessary. Those who are uncomfortable with this three-tiered system may choose to adhere to a stricter red/green system, where there are only interventions that meet or do not meet the requirements to be implemented.

Regardless of the system the practicing behavior analyst chooses, they must determine how they view EBPs and non-EBPs. Will you view EBPs as a list of procedures and packages that meet qualifications regarding the available evidence (e.g., National Autism Center, 2009, 2015), in terms of manualized treatment packages that consist of randomized control trials to support their effectiveness (i.e., Smith, 2013), or as a decision making model drawing upon the best available scientific research, client values and context, and a behavior analyst's clinical expertise (e.g., Slocum et al., 2014)? This view will help determine the system to use to help determine if a procedure should or should not be implemented as well as the components of that system (e.g., which interventions should be green, how to determine if an intervention is yellow).

*Select a Professional Environment that Aligns with your Values*

It is imperative that practicing behavior analysts select a workplace whose organizational values align with their own. This could help prevent some of the challenges associated with the aforementioned crossroads. For example, if a practicing behavior analyst decides that implementing procedures with no empirical data to support their use does not align with their values, then it would be helpful to avoid working for organizations where those procedures are readily implemented. Conversely, and hopefully unlikely, if a practicing behavior analyst decides that implementing procedures with limited to no empirical data to support their use does align with their values, then it would be helpful to avoid working for organizations where those procedures would not be implemented under any conditions.

As such, it is important to proactively evaluate possible employers/organizations prior to employment to see if their values align. If this preliminary evaluation results in identifying an organization with aligned values, it will be important to follow-up and ask questions (e.g., "Does your organization support the implementation of alternative treatments?") during the interview process to confirm the results of the preliminary evaluation and address any areas that may be unclear. Concurrently, the interview is a good opportunity to describe your values and any possible areas of conflict and how those conflicts will be resolved.

*Be as Proactive as Possible*

Similar to progressive approaches to treating challenging behavior (e.g., Ala'i-Rosales et al., 2019), practicing behavior analysts should proactively discuss the use of alternative treatments when collaborating on an interdisciplinary team. The approach to being proactive is likely to vary depending on the setting in which the practicing behavior analyst is working. For example, if a behavior analyst finds themselves working in a home or clinic setting, the process should start during client screening and no later than intake. At this time the behavior analyst should clearly articulate for the consumer: (a) how the parent/client values are incorporated at all stages of intervention, (b) the procedures that will be implemented, (c) the philosophy/rationale behind those procedures, (d) what constitutes an EBP and why it is important, (e) what procedures will not be implemented, (f) what happens if these procedures are implemented or suggested, and (g) how collaboration occurs within the agency. Throughout this initial discussion meaningful and genuine rationales should be provided and any questions are answered. This discussion should continue to be revisited periodically throughout the course of the intervention.

Many practicing behavior analysts work within school settings where the likelihood of collaborating on an interdisciplinary team is practically inevitable. Although, the approach within this setting will differ from services that take place within a clinic or home setting, there are several steps the behavior analyst may take. First, when possible, seek out members of the interdisciplinary team prior to collaborating on any specific case. This provides an opportunity to develop rapport with other members of the team and could involve getting to know the team members, identifying their general ideas and philosophies, and how to best communicate with their team (e.g., how to provide feedback, how to bring up disagreements). Second, communicate your values and approaches to intervention with the team members. This could be done in a manner like the approach within home and clinic settings described previously. Finally, establish the nature of the collaborative relationship, outlining how to work together best, listen to each other's recommendations, and how to best navigate professional discourse. Similar to working in a home or clinic setting, these discussions should be revisited periodically to maintain rapport and address any changes since the initial, or previous, discussion.

*When all else Fails, Develop a Reactive Plan*

Each of the previous guidelines were designed to proactively address recommendations or the implementation of alternative treatments. It is likely that even if these guidelines are used, members of an interdisciplinary team will recommend or implement alternative treatments. It is possible to be reactive in these situations while minimizing harm or risk for the client, adhering to the principles of science and behavior analysis, and remaining respectful of all members of the interdisciplinary team.

First, it will be important to engage in active listening. Psychologists and behavior analysts have recommended active listening for many years, which involves engaging in appropriate nonverbal behavior (e.g., facing the person speaking, making eye contact, appropriate facial expressions) and listening to the other person without interrupting (Borck & Fawcett, 1982). Throughout the exchange, it will be important to engage in behavior that demonstrates listening and reflecting (e.g., head nods, reflective statements, verbal encouragements). When it is appropriate to engage in meaningful and productive dialogue (e.g., the other person has stopped talking), it will be important ask clarifying questions, seek out more information, and outline one's values and perspective. This should be a discussion, but does not mean there may not be discourse. At some point in the discussion there will be agreement to implement or not implement the alternative treatment.

If there is a recommendation for the implementation of an alternative treatment, then it will be necessary to conduct a risk benefit analysis. In this situation, a risk benefit analysis would involve identifying and comparing the relative risk of implementing the alternative treatment to its possible benefits. Assessing possible benefits should involve, but is not limited to, identifying research supporting the effectiveness of the alternative treatment and client and consumer satisfaction and preferences. Assessing possible risks should involve, but is not limited to, an analysis of the possibility of short- or long-term psychological or physical harm to the client (Brodhead, 2015) and negative effects on the members of the interdisciplinary team. We strongly encourage practicing behavior analysts to include the possibility of time spent on an ineffective, but not harmful, alternative treatment as a possible risk. If it is determined that the risks outweigh the possible benefits the treatment should not be implemented, and it will be important to share this information with the interdisciplinary team, client, and caregivers in a clinically sensitive and responsive manner. If it is determined that the risks do not outweigh the possible benefits and the decision is made to implement the alternative treatment, there are at least two options available to the practicing behavior analyst.

One option that has been previously recommended is to systematically evaluate the effects of the alternative treatment (e.g., Normand, 2008). This recommendation has proven fruitful and has resulted in published evaluations of alternative treatments and methods (e.g., Chok et al., 2010; Lerman et al., 2008). However, great caution must be taken when systematically evaluating the effects of the alternative treatment in this way. In essence, the team would be conducting a mini experimental analysis and all the same procedural safeguards used within research to control for threats to internal and external validity should be considered. As such, this systematic analysis needs to go beyond simply taking baseline and intervention data and involve best practices in single subject research such as, but not limited to, establishing stable baseline responding, repeated baseline conditions, implementing the intervention without any other changes, repeated and/or staggered intervention conditions, and measures of treatment fidelity.

A second option that has been previously recommended is to alter the alternative treatment to align with behavioral principles (Kirby et al., 2022). This can be done by adding components of behavior analytic intervention to the alternative treatment (e.g., including preference assessments) or identifying if any components of the alternative treatment are conceptually aligned with ABA. Similar to the previous option, this option must be exercised with great caution for several reasons. First, the addition

of behavior analytic components may increase the perceived benefits and effectiveness of the alternative treatment. However, like any treatment package, it will remain unclear what is responsible for any behavior change (desired or undesired). As a result, time could be spent implementing ineffective or less effective components. Second, if the alternative treatment has competing components, it could decrease the effectiveness of any added behavioral components. This could lead the team and consumer to conclude that otherwise effective behavioral interventions are not effective. Third, as Goldiamond (2002) importantly noted, "just because some sets of procedures can be analyzed in operant terms does not make them behavior modification procedures" (p. 149). Nonetheless, conceptualizing an alternative treatment as behavior analytic may lead the team and consumer that the alternative treatment is, in fact, an ABA-based intervention.

*Navigating the Crossroads: Researchers*

Behavior analytic researchers have a long history of critically and experimentally evaluating alternative treatments that are implemented with autistics/individuals diagnosed with ASD (e.g., Chok et al., 2010; Howard et al., 2005; Leaf et al. 2018; Lerman et al., 2008; Normand, 2008). These critiques have included such alternative interventions as facilitated communication (Montee et al., 1995), rapid prompting method (Schlosser et al., 2019), Social Thinking™ (Leaf et al., 2018), bonding (attachment) therapies (Chaffin et al., 2006) and sensory integration (Lang et al., 2012). Recently, some have suggested that such evaluations are examples of disciplinary centrism, hubris, and "may stunt our science and the progression of our field" (Kirby et al., 2022, p. 136). When statements are made in less formal settings (e.g., social media) to avoid these evaluations, it is concerning; however, such statements occurring in peer reviewed behavior analytic journals is alarming. Regardless of the outlet, we could not disagree more. These evaluations have provided much needed critical and experimental evaluations of alternative treatments which can help save consumer resources and prevent harm for the clients we serve. We contend these evaluations are based on the scientific tenets of philosophic doubt, empiricism, and experimentation, not disciplinary centrism. Suggesting otherwise minimizes the importance of the scientific method and EBPs and may result in an increased adoption of harmful alternative treatments.

The previously cited examples of critical and experimental evaluations of alternative treatments did not conclude the evaluated treatments were negative or ineffective simply because they were not conducted or developed by behavior analysts. No intervention should be discounted simply because it stems from a different field, practice, or researchers (Kirby et al., 2022). There are numerous examples of the development of quality interventions and research evaluations stemming from the fields of speech language pathology (e.g., Speech-Language & Audiology Canada, 2018), occupational therapy (e.g., Bodison & Parham, 2018), psychology (e.g., Sanders, 1999), and pediatrics (e.g., American Academy of Pediatrics, 1998) to name a few. Research and interventions should be evaluated upon the universal principles and standards of science (previously described) and interventions should be selected or not selected based on these evolutions regardless of the origins of the interventions. For example, the quality of the research methodology (e.g., clear operational definitions, appropriate research methodology) used in Social Stories™ research has been evaluated numerous times (e.g., Kokina & Kern, 2010; Leaf et al., 2015; Rust & Smith, 2006; Sansosti et al., 2004). Thus, warnings against the use of Social Stories™ (e.g., Leaf et al., 2020) have been issued as a result of a lack of experimental evidence of effectiveness not the credentials of the individuals conducting the research. Similarly, Social Thinking™ was evaluated to determine if the research met the definitions of an EBP or empirically supported treatment (e.g., Leaf et al., 2018). Social Thinking™ research was found to not meet these definitions but did have many of the hallmarks of pseudoscience (Leaf et al., 2016), and this would be the case regardless of the credentials of the individuals conducting the research.

We contend that behavior analytic researchers have an obligation to the science and practice of behavior analysis to continue to critically and experimentally evaluate alternative treatments. This is not to diminish the value of other interventions, but, rather, to provide necessary information to inform best practices and maximize the effectiveness of the interventions for our clients. This information can also be invaluable in informing effective and compassionate collaboration within interdisciplinary teams. A hallmark of our profession is ensuring that all procedures implemented by our professionals are conceptually systematic, effective, and empirically supported; this is an aspect of alternative treatments that must continue to be discussed in the literature.

**Conclusion**

There are hundreds, if not thousands, of interventions designed to help improve the symptomology associated with autism (Jacobson et al., 2010), with the ultimate goal of improving the quality of life for autistics/individuals diagnosed with ASD. Many of the interventions available have no empirical evidence to support their effectiveness (e.g., Rapid Prompting Method, Son-Rise), while others have studies in peer reviewed journals (e.g., Social Thinking™, Relationship

Development Intervention) but include methodological flaws limiting the interpretation of the results (e.g., see Leaf et al., 2018; Milne et al., 2020). Behavior analysts collaborating within interdisciplinary teams are likely to find themselves at difficult crossroads that include implementing these alternative treatments, defining and determining risk and harm, and evaluating research and interventions. These crossroads and the decisions that result have always been a relevant aspect of being a behavior analyst, especially when working within an interdisciplinary team. Nonetheless, the challenges associated with collaborating within interdisciplinary teams are likely increasing with behavior analysts continuing to expand the field by working with different populations and within different contexts. Ultimately, when navigating any crossroad that a behavior analyst might find themselves in, it is important to remember the moto "Primum Non Nocere" (i.e., first, do no harm; Normand, 2008). The guidelines and discussion provided here was done to demonstrate the possibility of navigating these crossroads while minimizing harm or risk for the client, adhering to the principles of science and behavior analysis, and remaining respectful of all members of the interdisciplinary team. That is, we can maintain the scientific tenets of philosophic doubt, empiricism, and experimentation while remaining humble and ensuring our clients access the most effective interventions available.

**Footnotes**

[1]The terms diagnosed with autism/ASD, on the autism spectrum, individual with autism/ASD, and autistic are used throughout this paper. The authors recognize that there are varied preferences and conventions related to person- and identify-first language among the academic and autistic communities. The terminology selected for use in this paper is to be inclusive of varying preferences as well as grammar and stylistic needs and does not reflect a terminological intent.

*Conflict of Interest:* This paper was submitted as part of a special issue that the first and second authors were asked to develop, solicit papers, and serve as editors. The paper was sent to a different editor and was sent for blind review. All authors currently or have provided behavioral intervention for autistics/individuals diagnosed with autism. All authors have commercially available products related to applied behavior analysis and individuals diagnosed with autism. The first and fifth author own a company that provides behavioral intervention for individuals diagnosed with autism.

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# Autism and Behavior Analysis: From Dissonance to Dialogue

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## Abstract

Questions about human behavior and diversity have captured the attention of scientists from a wide range of philosophical stances for centuries. While behavior analysts would argue that natural science is an enlightening perspective when applied to the understanding of the human condition, at times arguments within certain campaigns would prefer Applied Behaviour Analysis (ABA) to be banned or abolished. In this paper we discuss some of the roots of this stance and suggest a way forward based on what are basically complementary views on the goals enshrined in rights-based practice.

**Keywords:**

Natural Science, Behavior Analysis, Human Diversity, Autism Diversity, Discrimination

## Introduction

Exclusion in all its many guises is an ugly thing and, in this paper, we discuss consequences that arise for autistic individuals who have particularly high support needs (American Psychiatric Association, 2013; Lord et al., 2022), if applied behavior analysis (ABA)-based services were abolished or excluded (Graber & Graber, 2023). We argue that countering exclusion and ensuring real inclusion requires dialogue and genuine empathy.

Autistic self-advocates commonly report the consequences of discrimination, ableism, a normalizing agenda, being viewed from a medical rather than a social model, and misunderstandings concerning support needs (Tarvainen, 2019). Until the 1980s, autism was not officially recognised (Volkmar et al., 1988) and profoundly autistic people (Lord et al., 2022) were considered unreachable or unteachable and commonly confined to a lifetime in institutional care (Gómez-Durán et al., 2014). Those who presented with challenging behavior were exposed to electroconvulsive therapy (ECT) and/or physically and pharmacologically restraint (Nielson et al., 2021; Schnitzer et al., 2020).

While this situation seems not to have changed in some countries (Buivydaite et al., 2017; Lipinski et al., 2022), in the 1960s, behavior analysts in the USA were the first professionals who were able to show that profoundly autistic individuals were not "unteachable," but that they could be taught and


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that they could learn (Ferster & DeMyer, 1962). They applied the principles of behavior formulated by the science of behavior analysis to design environments that facilitated skills development for persons who had been exposed to long-term care in designated institutions. Since then, the field of applied behavior analysis (ABA; Baer et al., 1968, 1987) has grown, particularly with regards to supporting autistic individuals (Surgeon General, 1999). So much so, that today ABA is viewed as providing the basis for "gold standard" interventions used to support individuals on the autism spectrum (Koegel, 2011; Lovaas, 1987; Smith & Eikeseth, 2011). With such a high profile, it is not surprising that for some, the abbreviation ABA practically became a synonym for a method of autism intervention (Chiesa, 2006; Dillenburger & Keenan, 2009).

In the meantime, disability advocates achieved some success in their fight against discrimination, health disparities, and ableism (Borowsky et al., 2021; Nario-Redmond et al., 2019; Tarvainen, 2019; Thorne & Barr, 2022), including extensive ratification of the United Nations Convention for the Rights for Persons with Disabilities (UNCRPD, 2006). As for autistic people, the fight for awareness, acceptance, and equal rights continues to be shaped by autistic self-advocates, mainly through the newly formed neurodiversity movement (Leadbitter et al., 2021a, 2021b; Silberman, 2015) as well as families of children with profound autism (Unumb, 2013).

But somewhere along the way, something has gone wrong. The special and supportive relationship between behavior analysts and profoundly autistic individuals and their caregivers that was built on deeply rooted care and trust in science appears to have been highjacked by an anti-ABA movement that views the discipline of ABA as abusive, causing post-traumatic stress, being ableist, and promoting a normalizing agenda (Kupferstein, 2018; Milton, 2012; Sandoval-Norton & Shkedy, 2019; examples of shockingly bad practice by poorly trained professionals can be found on YouTube). The focus of this paper is to discuss how those who have dedicated their lives and their science to helping people (i.e., behaviour analysts; cf., APBA, 2017) are being singled out and accused as protagonists of all of society's ills with regards to maltreatment of individuals with autism.

While in his early writings Milton (2012) could be viewed as one of the leading denigrators of ABA, more recently he has sounded much more conciliatory and even seemed to hint at the solution when he discussed the double empathy problem (Milton, 2018):

...when people with very different experiences of the world interact with one another, they will struggle to empathise with each other. This is likely to be exacerbated through differences in language use and comprehension. (Theory of double empathy section, para 1)

In order to balance a debate that generally is dominated by the views of autistic self-advocates, we offer an insider view of the perspective of behavior analysts who aim to help profoundly autistic people. What follows is an overview of our personal story as behavior analysts and the struggles to address the imbalance in discussions that could prevent profoundly autistic individuals receiving the kinds of supports that our science can offer.

Recently, we learned that the 3-year-old child we met in 1997, and whose parents we introduced to the discipline of ABA all those years ago, passed his driving test and he got a job in the open employment market. To be honest, that touched us deeply, more in fact than when he was awarded his Master's degree in American History a few years earlier. Before we met him, he had been assessed by all the usual health and allied health professionals, none of whom (according to reports by his parents) were able to help him acquire even the most basic skills. According to their clinical assessment reports, he was never going to learn to speak in full sentences and was destined for an institution. Together with his mother and other parents, we established the charity "Parents Education as Autism Therapists" (PEAT; the title was chosen by parents). During the subsequent 20+ years, PEAT helped hundreds of families build important life skills for their children, we co-authored the first book about ABA and autism in Europe (Keenan, Kerr, & Dillenburger, 2000) that has been translated into German and Japanese (Keenan, Kerr, Dillenburger, et al., 2000), we co-produced a multilingual multimedia online ABA training platform that has been translated into ten languages (German, Spanish, Dutch, Italian, Swedish, Icelandic, Norwegian, Czech, Portuguese, Canadian French, with Greek and Japanese in progress; Simple Steps, 2013), and we collaborated in a range of large scale research projects (Dillenburger et al., 2010, 2015; Keenan et al., 2010; 2022)

These are remarkable achievements inspired by a small parent-led charity that was established and provided services for over 20 years without any support from government. What is even more remarkable is that this charity was set up in Northern Ireland, in a context where their community has been torn apart by violent conflict over many years (Dillenburger, 1991, 2007; Fargas-Malet & Dillenburger, 2016), and their story continues to be one of struggle against prejudice, discrimination, and repression, as oftentimes the language used to caricature ABA (as ableist, abusive, prejudicial, discriminatory, and pushing a normalizing agenda), is itself ableist, abusive, prejudicial, and discriminatory (e.g., Baron-Cohen, 2014; Kupferstein, 2018; Sandoval-Norton & Shkedy, 2019).

Here is the problem. As behavior analysts, we think differently from most other people. As scientists, we avoid mentalistic pseudo-explanations for behaviour (APBA, 2016; Chiesa, 1994; Green, 2016; Skinner, 1953b; Thyer, 2009; Thyer & Myers, 1999; Thyer & Pignotti, 2010). Instead, our raison d'etre is the discovery of fundamental principles of behavior. We investigate the intimate relationship between environmental contingencies and behavior. The language we use to describe these relationships is full of what sounds like "jargon" to those who are not familiar with the science. A point to make here is that in any other science the terms scientists use may appear strange, cold, alien, even overly technical (Keenan & Dillenburger, 2000). This is because the terms scientists use are short-hand for discussions with other scientists, and therefore they have to be defined very carefully. As Milton (2018) realised, there are "differences in language use and comprehension" (Theory of double empathy section, para 1) that can hinder communication between people with different experiences, as would be the case between scientists and non-scientists.

In fact, while the everyday language we inherit from our parents has its role in everyday life, it interferes with the precision required by science (Skinner, 1953b) and thus does a poor job for scientists (Chiesa, 1994; Moore, 2013a). Take for example, the term "behavior." In everyday use of the term, it refers to "the way in which one acts, especially towards others," oftentimes meaning "bad behavior" (e.g., "Did the children behave?;" Cambridge University Press, 2020). In contrast, when behavior analysts talk about "behavior," we define the term behavior as the "interaction of the organism with their environment," both, historically as well as currently (Cooper et al., 2007; Phelps, 2007). We talk about lifelong "learning histories" as well as "cultural meta-contingencies" that impact on present behavior (Glenn, 1988, 2004). This holistic view of behavior includes private behavior (what happens inside the skin, e.g., thinking and feeling; Skinner, 1977; Keenan & Dillenburger, 2022 Mentalism Chapter) as well as public behavior (e.g., moving and speaking; Skinner, 1953a, 1957). The image of a stream or river is helpful here. We cannot talk about a river without referencing both the water and the banks through which it flows. Likewise, behavior analysts consider that the skin does not separate us from the world, but it connects us to it. This is a completely different way of viewing the world in which we live, with major implications for understanding the process of living where a typical lifespan can be over 2,208,988,800 s. Called the behavioral stream, the process of living is viewed as a stream of experiences accumulated throughout one's lifetime (Keenan & Dillenburger, 2022, Behavioural Stream and Private Events chapter).

There is no formal "diagnosis" for our way of being, nor should there be. As behaviour analysts we are just different, with diverse views within our community. The science we employ to study behavior is attracting more people from around the world (see ABAI, 2022; APBA, 2016). Yet, we are being told by some (e.g., the neurodiversity movement) that we are wrong in what we are doing, even alleging that we are causing harm and abusing vulnerable children on the autism spectrum (Sandoval-Norton & Shkedy, 2019). They demand that everyone (and that includes behavior analysts) conform to their normalizing agenda and their way of doing things (Milton, 2012).

As mentioned previously, when behavior analysts study the behavioral stream, the goal is to increase awareness of how behavior is affected by environmental contingencies. This is a formidable task and the methods that have been developed have enriched lives in a wide range of areas (see Cambridge Centre for Behavior Studies, 2022; Heward et al., 2022). Sharing the findings from behavior analytic research is not without its problems. When autistic children experience severe challenges, commonly parents seek guidance on how to design experiences for their children in order to facilitate the emergence of confidence and independence. In other words, parents need to learn how to implement "interventions" with precision and fidelity. Behavior analysts have developed many strategies for designing bespoke experiences that straddle education and health issues. Denying either the existence of the principles of behavior or their relevance to education and health is simply not an honest way to proceed.

In contrast to North America, where there are laws to ensure ABA-based interventions are available to those who need them (Unumb, 2013), in Europe the misinformation about ABA disseminated by people not trained in the science has resulted in ABA-based services generally not being endorsed by governments (Keenan et al., 2022). In fact, some parents report that they have been threatened with the removal of all autism services if they continued with their ABA-based home programs (Dillenburger et al., 2015). Intriguingly, these threats occur even though their children are making progress at home and are learning skills that they did not learn at school (Larsson, 2021). Keenan (2016) pointed out that this kind of anti-ABA perspective implies that parents who seek to improve their awareness of how best to educate their children should apologise to their children. Maybe they should say things like "We didn't know that by educating you, by preparing you for the future, we inadvertently did not 'accept you as you are'?" (Keenan, 2016, p. 10). Or maybe they are supposed to say to their children:

Please forgive us for designing experiences for you to have fun, for toilet-training you, for helping you make friends, for supporting you to manage your self-injury, for teaching you to communicate, for giving you the

skills to make choices and convey your individuality, and for expressing our love for you in numerous other practical ways. We did not know that this could be interpreted negatively, as trying to change who you are or as trying to make you 'normal' (Keenan, 2016, p .10).

Those who perpetuate myths about behavior analysis are missing the point completely if they consider these parental apologies to be necessary. On one hand they dismiss the whole science because they object to the idea of "deliberately doing something to change a person" (i.e., education). Yet in the next breath, they propose to engage socially with a person in applied settings in the hope that the person be supported or empowered (i.e., changed). The additional layer of awareness provided by the science of behavior analysis in relation to the effects of environmental changes is considered an anathema. What is truly very sad about this situation is that it impacts directly on the benefits to be derived from awareness of how environmental contingencies contribute to the outcomes of education.

The anti-ABA stance generally is at odds with the science of behaviour analysis for a number of other reasons. Behavior analysis embraces the full spectrum of neurodiversity and there is no better evidence than the way it addresses the differing educational needs of each person in applied settings (Kazdin, 2010). To ensure that the focus is on the individual, we use single-system research designs to monitor changes in the behavioral stream (Keenan & Dillenburger, 2011) instead of using comparative group designs which commonly leave one group without support that may be desirable (e.g., NICE, 2013).

The result of the spread of misinformation is that a whole science has been branded as controversial (Parker, 2015) when the real controversy should revolve around the deliberate dissemination of misinformation. The misrepresentation is so pervasive in Europe that on one hand it is said that it would be wrong to invest in only one "thing" like ABA, while on the other hand it is argued that it is acceptable to invest in one "thing" called an "eclectic approach," even though there is evidence that ABA-based interventions are more effective than eclectic interventions (Howard et al., 2005, 2014). Unfortunately, no-one addresses the ethical questions that arise from the role played by the Dunning-Kruger effect (Benzel, 2022; Hofer et al., 2022) when misinformation and the associated caricatures of ABA form the basis of government strategies and policies (Dillenburger et al., 2014). Vyse (2022) is right when he says:

> *It is one thing to form a social movement in an effort to gain greater acceptance of and better supports for a group of people in need. It is quite another to do so at the expense of another group who is also in great need. Helping people on the autism spectrum should not be a zero-sum game with gains at one end of the spectrum requiring losses at another. Unfortunately, the autism self-advocacy movement's attacks on ABA [applied behavior analysis] create just such a dilemma (The Death of Truth and Freedom section, para 3).*

To ward off the onslaught of the anti-ABA perspective (Note: this language is often used by parents on the receiving end of misinformation), some have suggested that it might be best to change the name of ABA. This suggestion is truly symptomatic of the stresses to which parents are exposed. What other science has to contend with a name change as a strategy for managing the aversive consequences produced by discrimination and prejudice. One of the authors (MK) explains:

> *As a child who grew up in N. Ireland, I am familiar with many facets of prejudice. Raised by a Protestant mother and having a Catholic father, I experienced at first hand the damaging effects of misguided conclusions conceived in the shadow of myths. When visiting my grandparents, it was at times a surreal experience to cross from one perspective tainted by prejudice to the other perspective similarly tainted by a different kind of prejudice. I was exposed to exclusion and discrimination based on prejudice. In many walks of life during my childhood, Irish people were not welcome, as expressed in the sign in the window "No Irish".*
>
> *Never did I imagine, though, that in my professional life those scenes from my childhood would be replayed. I should have known better. Behavior analysts are not welcome. The sign in the window should read "No ABA' or "No Behavior Analysts." In Shakespeare's play Romeo and Juliet, Juliet described the conflict between the rivalling families with the poetic words: "A rose by any other name would smell as sweet." The families of my own parents, and the families described by Shakespeare, were not able to break free from the experiences that shaped their beliefs in order to accommodate another with different experiences and consequently a different perspective.*

Yet, many parents of children with autism have been able to break free from the misinformation and myths about ABA and as a consequence their children have benefitted greatly (e.g., ABA4All, 2022). Unfortunately, we have seen parents pushed to the point of exhaustion in defence of ABA in courts and tribunals fighting for their children's rights to have access to ABA-based interventions (Blakemore, 2021; Byrne & Byrne, 2000). Where else would this be allowed to happen? Where are the investigative journalists who want a human interest story, one about how health and education authorities peddle misinformation about a science in which they are not trained, while parents do what they can to defend a science which they evidently understand better than those professionals (Dillenburger et al., 2012)? The ethical drama that is played out in these situations simply is staggering and at the same time diabolical.

It is almost as if the parents are put on trial for being witches, inhuman creatures who are hell bent on harming their children. The truth is that these parents are heroes, mustering all of their love to defend the opportunity for their children to acquire skills that others believed they were unable to acquire. So much for equality of opportunity and disability rights. So much for the rights of their children to be regarded as people deserving of the opportunity to be guided by a science dedicated to bringing out the best in people through its accumulated understanding of the principles of behavior change.

Clearly, those who are against ABA are not the only bastions of love for children. Nevertheless, ABA professionals who guide parents when educating their children continue to be maligned for doing so. It is worth stating that again in other words. Parents who have used the discipline of ABA to successfully empower their children and improve the quality of their children's lives have been criticised for doing so. They have been criticised because some people proposed that the evil world of ABA could never produce something positive. Indeed, they would consider these parents to have been duped into adopting a perspective that emphasises the importance of normalizing children, and not accepting their uniqueness. One of the authors (MK) elaborates:

> *When I hear that kind of misguided anti-ABA rhetoric, I find myself straddling the mindsets of both sets of my grandparents (one set from a Protestant background and one from a Catholic background). It was never possible for them to accept that something positive could emanate from the other camp. Of course, this was not always the case for them, but when it came to important matters that divided the community, they each held firm to how they had been taught to view their nemesis. My time growing up in a divided community has brought many stresses to me personally. But it has also educated me in showing how twisted logic is used to defend either position when it is challenged. There was a time in my childhood, for example, when one could have been challenged in the streets along these lines:*
>
> *"Are you a Catholic or a Protestant?"*
>
> *"I am an atheist"*
>
> *"Are you a Catholic atheist or a Protestant atheist"*

There is no normalizing agenda at the heart of ABA. Apart from this correction, there is another misguided criticism that needs to be rebuffed. It is said that using ABA is tantamount to using a one-size-fits-all approach that ignores individual needs. This one-size-fits-all criticism is entirely misleading because there is indeed one thing that is used by the scientist/practitioner to guide the development of bespoke services, and it is called the scientific method. But this is entirely different from the kind of plug-and-play conceptualisation of one-size-fits-all conjured up by authorities who refuse to invest in ABA. Surely it cannot be wrong to employ professionals who use the scientific method in the 21st century for designing bespoke services. Nurturing an individual using the scientific method so they can feel empowered by the acquisition of skills is an enlightened act of human kindness, not the act of a despot intent on removing their uniqueness (Keenan & Dillenburger, 2020).

To conclude, here is an example that illustrates what can be achieved with good quality ABA-based interventions. Following it is a contrived example of the sorts of criticism that have been levelled by others in the face of something that does not sit well with preconceived ideas about the nature of ABA. This case study was provided by Dr. Nichola Booth (personal communication):

> *A young boy, 8 years old, had a confirmed diagnosis of autism and was non-verbal. It was reported that he had excessive amounts of saliva that was impacting on his day-to-day social and educational experiences. At school he was being isolated from his peer group as he was rubbing the saliva over other children, teachers, classroom assistants and equipment. The same behaviors were happening at home to the point where his parents would not have visitors because their furniture was covered in dried saliva. His clothing was destroyed from being caked in dried saliva.*
>
> *After medication failed, the parents went back to their GP. It was at this stage that they were told the next step would be a referral to a surgeon for an invasive operation where a piece of his mouth would be snipped to reduce or eliminate the extreme levels of saliva. Due to waiting times for this appointment, the parents accepted this and went home.*
>
> *While waiting for the hospital appointment the parents decided to access the services of a behavior analyst for support, but nothing related to the saliva issue. The ABA professional came to the family home and carried out parental interviews and behavioral observations to determine what supports would be required. While carrying out the observation he noticed the behavior associated with excessive saliva production, especially the wiping of the saliva on all items and people within the room. This was raised as a potential issue to be addressed and it was then that the parents explained what had happened to date. The behavior analyst suggested that they could perhaps put a programme in place to see if this behavior could be reduced without the need for surgery. The parents agreed.*
>
> *Following collection of data from additional observations, both at home and at school, a plan was developed. A sensory tray of all 'goo-like' items was made and placed in the main family room in the home. Alongside this, a visual sign for the tray was made available across the home environment for the child to access.*
>
> *The parents were educated in how to identify when the excessive saliva related behaviors were about to occur – these included heightened vocalisations,*

*hand-stimming, and facial movements. When the parents saw these behaviors, they were immediately to prompt the child to point to the visual for the sensory table visual and then immediately redirect him to the sensory tray. He was then requested to 'play' and the parents modelled some of the playing behaviors for him with the items in the tray.*

*This strategy was implemented successfully in the home with the saliva related behavior reducing significantly before it was introduced in the school setting. The end results was that surgery was no longer required and the behavior had decreased with the child being fully reintegrated back into school and other social events.*

*A Critique of this Case Study*

It is awful that the child was not accepted for who he was by both the medical professional and the ABA professional! Instead, they each attempted to normalize him, one using drugs and then proposing an invasive surgical procedure. The ABA professional was more deceptive and hood-winked the child into changing his behavior, thereby refusing to acknowledge the child's need to engage in his preferred activity!

## Conclusion

With so many parents of profoundly autistic children now championing ABA while others try to stop all ABA, it is clear that something is amiss. As can happen in any profession, some people have been on the receiving end of malpractice. In medical practice, some people have even been murdered by their doctors (Gunn, 2010) and of course, the actions of such people must be restricted, but not at the expense of the entire discipline of medicine. The same has not been the case with ABA. It seems that some malpractice has led to the condemnation of the whole science.

In the midst of the struggle for equality, one very important point should not be overlooked. There is a strategy often fostered by an establishment in many walks of life called "divide et impera" [divide and conquer], an approach that Julius Cesar used successfully 22 centuries ago (Razzetti, 2018). While autistic self-advocates and behavior analysts are at logger heads, the establishment does not need to change and can continue to discriminate unhindered. This paper is a call from behavior analysts to autistic self-advocates to heed Milton's (2018) call for the full appreciation the double empathy problem and join together against the real nemesis of autistic people, societal and political discrimination, inertia, and indolence.

## Competing Interests

Authors are Irish doctoral-level behavior analysts and identify as somewhere on the spectrum of human diversity. They have no financial or non-financial interests that are directly or indirectly related to the work submitted for publication. No funding was received for research reported here.

## Author Contributions

Authors contributed equally to the paper.

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# Excessively Positive Narratives Diminish Autistic People of All Ages

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## Abstract

Evolving discourse about autistic individuals swims in murky territory, with ongoing debates over how the autistic community should represent itself and how the neurotypical population should engage with them. One tendency that has emerged is the depiction of autistic individuals as kind and well-intentioned but also simpleminded and guileless. This, in combination with the dominant imagery of autistic individuals as children, has created an atmosphere in which all autistic individuals are stripped of their human complexity by the neurotypical gaze, and by extension are not given the fulfillment, support, and resources needed to make possible a life of sufficient quality.

**Keywords:**

Autism, Autistic Adults, Narratives, Applied Behavior Analysis

## Introduction

Current discourse about autism, which is often centered around children and inspirational stories, either excludes adults or infantilizes autistic people of all ages.

For all the diversity of people on the autism spectrum, the overall message in popular media and the testimonial pages of many awareness-raising nonprofit groups (Autism Speaks, n.d.) is relentlessly formulaic: the protagonist suffers from debilitating symptoms, but with the right support system they eventually overcome many of their difficulties and make progress towards adjusting to society's general expectation.

This is a positive formula I abided by in my own personal retellings. Materially, I had all the trappings of an "autism success story;" thanks largely to early detection and effective behavioral intervention based on the principles of applied behavior analysis (ABA), I have now far surpassed the original prognosis that I would only have a 50/50 chance of eventually attending a "mainstream" K-12 school. Instead of banging my head against the wall in frustration, I mutter profanities like a self-conscious New Yorker; rather than hiding in the corner to play with the carpet at parties, I gingerly find contrived excuses to approach strangers, like the time I placed my drink on an occupied table because "I needed both hands to check something on my phone." I am willing to compromise with friends and housemates, even if

that means sacrificing my principle of never letting a single morsel of food go to waste, no matter how far past the expiration date it has been lingering. Life in general is a pleasant, even fulfilling, experience.

Because I surpassed my original prognosis so drastically, advocacy and media organizations have invited me to share my insight to parents, educators, and doctors hoping to advance the cause of supporting autistic people and promote ABA as a humane and effective treatment, at least when applied correctly. I believed in my narrative of hard-won achievement, encapsulated in one 2016 seminar by its rather self-congratulatory title: "My Path from Autism to the University of Chicago." But for all my waxing about how "tenacity" and "hope" helped me overcome autism's most debilitating symptoms, I said little about the self-defeating, mean-spirited, and less traditionally virtuous tendencies I might still carry as an adult. This was not an intentional cover-up, at least consciously; my sense of worth hinged on my overcoming autism, and so I had convinced myself that it was overcome completely.

By whitewashing our accounts of "overcoming" autism, we stifle discourse and awareness about the most severe problems and character flaws we possessed and may still possess in adulthood. When this happens, both autistic children and adults are deprived of the support and resources they need to live healthy and fulfilling lives. In my stories, I would mention to audiences my social anxiety, my compulsion to prove my intelligence to others, and my recurrent misunderstanding of non-verbal cues. But these are vague, generalized points that do not shed light on how problems borne from autism or from the experience of autism can actively complicate my quality of life and the strength of my character—or, in other words, make me human.

I still agonize over the smallest faux pas I might have committed more than ten years ago, scrutinizing mental lists of witnesses who may or may not still remember and associate the incident with their opinion towards me. And yet, I am often quick to make moral and intellectual judgments of others, as if to convince myself that I am superior, somehow, over at least some people. But at least my judgement is less expressive and indiscriminate than it was before; in middle school, I comforted myself by verbally bullying classmates who I deemed to be "even lower" on the social hierarchy, including other neurodivergent peers. Autism has made me both more empathetic and more selfish. I want to do what is kind and just because I know what it is like to experience cruelty and injustice; at the same time, I am so insecure of my social position and reputation that I sometimes step over others to aggrandize myself.

To exclude nuance is to promote a false and problematic narrative of autistic people, with serious consequences. A workplace cannot accommodate an autistic adult, and a school cannot assist an autistic child, if they misunderstand who they seek to help—any attempt would only result in frustration, even trauma. The problem of nuance, or lack thereof, is not wholly the fault of me or a few others who might have once told a few varnished stories. The cause is also institutional. In popular media depictions, the characteristics projected on autistic people often appear to be the diametric opposites of negative characteristics that used to define the stereotypical autistic person. While autistic people are now less likely to be pigeonholed as crass, insensitive robots, they are increasingly viewed as innocent, endearingly eccentric victims who deserve the same protection and loving condescension as a gurgling infant. Even when they do not embody such traits, paternalistic expectations for them to conform in that manner and shield them from the world strips them of their agency and creates self-fulfilling prophesies of dependency.

This problem is reinforced by the high tendency of popular media and charitable organizations to depict autistic children rather than adults (Stevenson et al., 2011), which causes their consumers to envision autism as an adolescent issue above all else, and autistic adults as perpetual children. Rather than being harassed for flapping their left-hand mid-sentence, one autistic adult I know now receives comically infantilizing comments from peers of the same age. Another autistic adult graduates from high school like most other people do, and a photo of him in his robes is posted on a subreddit for "cute and cuddly pictures" alongside all the cats and dogs and plump, beady-eyed bunnies. I may no longer have this issue in my day-to-day life, but that is only because I learned to conceal my autistic tendencies after incidents like having to explain why I do not need a special helper to follow me around in public at age 17. Innocence and endearing eccentricity are not negative qualities by themselves, and representing autistic children is important. But when these things are used to reduce autistic people to a quarter-dimension of normal human complexity and intelligence, it creates a demoralizing, belittling experience for all of them.

There are many autistic people who suffer from more explicit and brutal forms of hardship, discrimination, and oppression, especially if they come from lower-income families, are nonwhite (Mandell et al., 2009), and cannot access resources like reliable, correctly practiced ABA-based therapy. Sometimes, people like 13-year-old Linden Cameron or 3-year-old Katie McCarron must even pay a blood price (Fortin, 2020). Poorly-conceived depictions of autism exacerbate these problems when much-needed attention is drawn away from their plight and redirected

towards shinier, more wholesome narratives. By over-promoting these kinds of narratives, we construct an idealization that encompasses everyone across the autism spectrum; and at the point in which we are no longer in touch with diverse and often harsh realities, we are fighting not for people, but for empty air.

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# Adulthood Begins in Preschool: Meaningful Curriculum in Support of Increased Independence for Individuals with Autism

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## Abstract

A meaningful curriculum is one that is individualized, inclusive of the individual's unique needs and interests, and focused on building independence in current and future environments. A meaningful curriculum addresses an individual's needs and prioritizes instructional programs based on what is, potentially, most important to their lives and not simply a somewhat arbitrary list of isolated skills. A meaningful curriculum is one that puts as much emphasis on skill acquisition outside of the classroom as it does on skill acquisition within the classroom or school. Unfortunately, the use of meaningful curricula to educate autistic students would seem to be something of a rarity, which may help to explain the consistently poor outcomes that individuals with autism and related disorders experience in adulthood. In this article, the authors make recommendations that may help practitioners to mitigate these outcomes by providing instruction in curricula that place a focus on adaptive behavior skills, the intersection of the individual, respectful intervention, and an emphasis on these important topics beginning in preschool, and increasing in importance and complexity across the lifespan.

**Keywords:**

Autism, Autism Spectrum Disorder, Adolescence, Adulthood, Transition, Curriculum, Assessment, Quality Of Life

## Introduction

Overall, individuals with an autism spectrum disorder (ASD) have poor adult outcomes when compared to same-aged peers in every area typically evaluated including employment, living arrangements, social and community participation, access to services, physical and/or mental health, and safety (Roux et al., 2015). Such outcomes have shown little improvement over time (Newman et al., 2010) and are worse than those of adults with other disability labels or identities (e.g., intellectual disability [ID], learning disability [LD], speech-language impairment, and emotional disturbance; Roux et al., 2015). On an annual basis, approximately 70,000+ autistic teens in the United States become adults (Autism Speaks, n.d.) but lack the necessary skills to successfully transition to an independent life after high school (Gerhardt & Lainer, 2011). On a macro-level, poor outcomes result in higher financial

costs to the family and to society at large (Dell'Armo & Tasse, 2018; Farley et al., 2018; Howlin & Magiati, 2017).

Upon leaving high school, autistic youth experience a drop in available services and supports that is generally referred to as a service cliff (Roux et al., 2015). While federal law (i.e., Individuals with Disabilities Act; IDEA, 2004) mandates the provision of special education inclusive of a plan to transition from school to the world of adult services, there is no similar obligation post-high school; this leaves families to fend for themselves when seeking appropriate services (Roux et al., 2015; Shattuck et al., 2020). Sadly, there is a backlog of service needs that easily exceeds the resources currently available (Gerhardt & Lainer, 2011). Over the next decade, Autism Speaks (n.d.) estimates that an additional 707,000-1,116,000 teens in the US will enter the world of adulthood, only further exacerbating this problem.

To address this problem, the role that parents, teachers, aides, behavior analysts, and related service providers need to play becomes nothing short of critical leading up to, and during, the transition to adulthood. While every student's transition plan should be individualized, every plan should provide attention to three major outcomes including employment, independent living, and happiness (e.g., Ticani & Bondy, 2014). Unfortunately, it seems that a combination of poor preparation leading up to adulthood and limited access to effective, individualized adult services, hinders progression toward such positive outcomes (Shattuck et al., 2020; Snell-Rood et al., 2020). Despite the fact that individuals on the spectrum can, and often do, make valuable contributions to the communities in which they live, they are often denied access to this opportunity. Providing a meaningful curriculum is one way to reduce such barriers and increase meaningful access.

*What Makes a Curriculum Meaningful?*

A meaningful curriculum is one that is individualized, inclusive of the individual's unique needs and interests, and focused on building independence in current and future environments (Ayres et al., 2011). A meaningful curriculum addresses an individual's needs and prioritizes instructional programs based on what is, potentially, most important to their lives. As positive adult outcomes can be predicted, in part, based on the adaptive behavior repertoire of an individual (Ayres et al., 2011; Dell'Armo & Tassé, 2018; Mazefsky et al., 2008; Mazzotti et al., 2016), instruction in adaptive skills lies at the core of any meaningful curriculum. Adaptive behavior is, essentially, any and all skills and abilities that allow independent functioning in their day-to-day life in the environment in which they live (Heward, 2005).

Adaptive skills are "so central to adult life that it would not be an understatement to say that good adaptive behavior skills will get a person through times of no academic skills better than good academic skills will get a person through times of no adaptive behavior" (Gerhardt et al., 2013, p. 167). Adaptive behavior should therefore be a priority in programming starting at a young age and increase in focus as individuals get closer to adulthood.

What is meaningful for some will not be meaningful for all and, as such, practitioners need to take the unique needs of each individual into consideration when confronted with general education standards. Strict adherence to the general education standards requires practitioners to target goals that will likely have little to no relevance to the adult lives of individuals. For example, learning to identify Saturn when you have not yet learned to brush your teeth would probably not be considered a meaningful goal for many (Ayres et al., 2011). There is a balance to goal development, and while academic skills may be part of a meaningful curriculum for some individuals, others may need to focus more on adaptive behavior competencies instead (although even the more "academic" student still needs to acquire meaningful adaptive behavior skills). In addition to academic skills and skills specific to the autism spectrum disorder (ASD) diagnostic criteria, other important adaptive skill domains include but are not limited to, self-care/hygiene, dressing, health maintenance, safety, cleaning/care of the home, cleaning/care of clothing, social skills and niceties, mealtime skills, community engagement, self-management, and leisure/recreation. A truly individualized and meaningful curriculum fulfills each individual's right to an appropriate education (Ayres et al., 2011; Ayres et al., 2012; Bahry et al., 2022b).

A meaningful curriculum should promote a balance between teaching high-value (high preference/high relevance) and low-value (low preference/high relevance) skills. A skill that is highly valued is more likely to be maintained over time, so should be prioritized in a meaningful curriculum (Gerhardt et al., 2013). However, low-value skills might also be important if they promote engagement, safety, or enjoyment in an indirect way. For example, showering may be a low-value skill to an individual, but mastery of the skill may lead to decreased body odor and increased neat appearance which may help promote engagement in social situations or the ability to get and retain a job (which both may be of high value). At the end of the day, applied skills are simply useful skills. If the skill is not valued, it will not be used; if the skill is not used often enough, the individual will likely, over time, lose their ability to display the skill.

A meaningful curriculum can be conceptualized as an antecedent-based behavioral intervention. When

caregivers and practitioners proactively set goals for young individuals with autism and other related disorders that are meaningful, the future risk of severe challenging behavior, abuse, and harm is reduced (e.g., Ala'i-Rosales 2019). Gaps in adaptive skills can be identified and targeted within the context of a meaningful curriculum, which can help to lower dependency on others across the lifespan and thus help to mitigate the risks discussed (Saulnier & Klaiman, 2022).

*Meaningful Intervention and Challenging Behavior*

A high prevalence of challenging behavior exists within the ASD population, specifically with such dangerous behavior as self-injury and aggression (e.g., Davies & Oliver, 2016). Often these behaviors develop as a result of skill deficits in other areas, such as communication. In a large population-based sample in the United States, self-injurious behavior (SIB) was reported to occur in more than 30% of children with ASD (Soke et al., 2016). Another large sample study found aggression to be reported in approximately 1 in 4 individuals with ASD, with a significant association found between aggression and overall cognitive level (i.e., IQ; Hill et al., 2014). The display of challenging behavior can, and often does, restrict the activity of adolescents and adults on the spectrum. Community-based instruction (CBI) often gets put on hold, as do job training opportunities due to the presence of challenging behavior. As such, a meaningful curriculum needs to adequately address these challenges to allow for increased skill acquisition in other important areas.

Despite having over 60 years of behavior analytic research focusing on the assessment and intervention of challenging behavior (Ala'i-Rosales et al., 2019), the vast majority of this research has been conducted in well-controlled research environments or clinics and not in a more typical environment (e.g., the classroom or the community). The complexity of autism education beyond the controlled environment (i.e., the real world) does not easily lend itself to well-controlled study conditions. Within the context of a meaningful curriculum, intervention with challenging behavior requires:

1. *Reductions in aggression or self-injury that result in positive changes to the individual's life*

   Reductions in the frequency of a particular behavior that does not result in increased community access or employment training opportunities for adolescents or young adults represents only part of the desired outcome.

2. *The development of a set skills that enables the individual to manage their own behavior and control relevant aspects of their environment*

   This could include, antecedent strategies such as behavioral relaxation/self-calming, functional communication training and support, context-appropriate refusal skills, the ability to accept delayed reinforcement, curricular modifications congruent with the individual's preferences, and environmental modifications that support greater access to positive reinforcement.

3. *A data-based justification that the behavior in question has a negative impact on the individual's quality of life or wellbeing*

   All of us engage in stereotypic behavior. The difference lies in our ability to recognize the social contingencies relevant to stereotypy and differentiate between "time in" conditions (when we can engage in stereotypy) and "time out" conditions (when we cannot engage in stereotypy). Any intervention targeting stereotypy needs to focus on teaching the individual how to recognize and respond to the two conditions.

4. *Recognition of each individual's right to be angry, irritated, or annoyed*

   This is only a problem when anger, irritation, or annoyance result in aggression or self-injury. Being pissed off is not a challenging behavior.

*Intersection of the Individual*

As previously discussed, a central feature of a meaningful goal is that it presents as meaningful to the student in question. In other words, meaningful goals require a much greater degree of individualization than do non-meaningful goals. Individualization of goals requires an ongoing evaluation of the intersection of the person and the environment, considering such parameters as personal preferences, dislikes, interests, and idiosyncrasies. When providing instruction either inside or outside of the classroom an understanding of the intersection between the person, their skill repertoire, and the requirement of the environment becomes even more critical. For example, a student may be more willing to independently apply deodorant if they personally pick the form (e.g., spray, roll-on) of the deodorant and its scent. TThis is an example of programming at the intersection of the individual; how deodorant feels or smells to them when applied can turn a meaningful but non-preferred skill into a meaningful, preferred skill.

As an educator or other professional, this should not be an alien concept as you practice it every day in your own life. For example, when you go to check out at the supermarket, there exists an intersection between your skill set and the environment: do you use self-checkout or go to a cashier lane? If you have only a few items, or you feel comfortable with self-checkout you could go there. Similarly, if you do not like waiting in line at the checkout, you may choose to do your shopping before going to work when there are fewer people at the supermarket. Either option represents a personal response to the intersection of the environment, a person's skill repertoire, and personal preferences.

For students with autism, particularly those with a limited skill set indicating preferences, the relevant intersections may be difficult to identify. In terms of meaningful curriculum, however, this only serves to further highlight the importance of individually determined CBI starting early on. For example, a goal to teach a person to respond with their current location when texted by a known person has value in terms of a personal safety goal, but initially may have limited meaningfulness to the individual. If that same individual loves chocolate cake, beginning instruction by sending them texts telling them where to find a piece of chocolate cake may make the process of "responding to a text" more valuable to the individual and, therefore, more meaningful. This systematic process is not easily accomplished, however, if the skill is to maintain, it has to acquire some personal meaning.

The simple truth is that if instruction in meaningful goals does not happen when an individual is in school, it is unlikely to ever happen, given the highly limited availability of supports and services in adulthood (Shattuck et al., 2020). Goals must be socially valid to the student, support team, and the immediate community in order for instruction to be successful (Schwartz & Baer, 1991). Social validity, as outlined by Wolf (1978), is the degree to which programming is acceptable to the student and to others. Ideally, society should be validating programming at every step of the planning process, including the goals selected, the procedures used, and the outcome of programming (Stokes & Baer, 1977; Wolf, 1978). The regular assessment of social validity can, and should, include the individual receiving services to whatever extent possible, as well as parents, caregivers, and other community members (Stokes & Baer, 1977). Meaningful programming that has been created can be validated using a number of already established measurement tools (e.g., Bernstein, 1989; Fawcett, 1991; Gresham & Lopez, 1996; Kazdin, 1980), with adjustments being made to programs as needed based on their results. A recommended beginning to identifying social validity early on is to use person-centered planning.

*Person-Centered Planning*

Person-centered planning is a process designed to allow individuals with disabilities to participate more actively and directly in their transition planning including attention to the person's preferences for a life they would consider to be meaningful based on their individual strengths, abilities, aspirations, and preferences (Collings et al., 2019). Person-centered planning has been found to promote more positive adult outcomes for people with various disabilities labels (Robertson et al., 2007). Autistic youth, however, can experience difficulties in participating due to communication and social deficits (Hagner et al., 2014). As such, embedding instruction in self-determination skills within a curriculum is an important component of individualized, person-centered intervention, especially because these skills often do not develop without specific instruction for individuals with disabilities (Stancliffe et al., 2000; Wehmeyer et al., 1996). As Wehmeyer and Abery (2013) stated, "Self-determined people are, in essence, actors in their own lives, rather than being acted upon" (p. 399). Such individuals make their own decisions, set their own goals, and create plans to meet these goals (Martin et al., 2019). The critical skill of self-determination has been shown to improve the likelihood of meaningful outcomes in adulthood, specifically in the areas of employment, postsecondary education, and independent living (Field et al., 1998; Lachapelle et al., 2005; Powers et al., 2012; Wehmeyer & Schwartz, 1997).

Self-determined behavior, including making personally relevant choices, has also been identified as a core dimension of quality-of-life and happiness (Shalock & Verdugo, 2012, Wehmeyer & Abery, 2013). Any meaningful curriculum should therefore prioritize communication skills instruction while concurrently assessing various indices of happiness (e.g., smiling, laughing, yelling while smiling) as well as unhappiness (e.g., frowning, crying, yelling without smiling) to determine and honor preferences (Dillon & Carr, 2007; Green & Reid, 1996). Techniques rooted in the principles of applied behavior analysis (ABA) have demonstrated our ability to clearly define and systematically increase, a number of indices of happiness even for individuals with profound multiple disabilities and limited to no communication skills (Dillon & Carr, 2007; Green et al., 1997; Green & Reid, 1996; Ivancic et al., 1997; Lancioni et al., 2002). The fact that data support that practitioners can identify and promote the acquisition of behaviors associated with improved quality of life and happiness, supports an argument in favor of meaningful curriculum and intervention on a practical and professionally ethical basis.

*How to Teach: Effective Interventions for Meaningful Goals*

Instruction in meaningful curricula is provided in the environment in which the skill is most likely to be used (Gerhardt et al., 2013). Skills targeted for acquisition that appear to be meaningful, lose that designation when taught outside of the relevant context (Brown et al., 1976). Practitioners cannot solely teach skills in classrooms or school hallways and hope for the best. For example, teaching an individual to cross the street while in the classroom is unlikely to generalize to the community without additional instruction in the community. As individuals get older, the proportion of instruction delivered in schools and clinics should be reduced and replaced to the greatest extent

possible with instruction in the context in which the skill will ultimately occur (Bahry et al., 2022a; Gerhardt & Bahry et al., 2022; Gerhardt et al., 2013). Long-term planning is crucial because individuals will only be in the classroom for a finite number of years, but will be out in the real world for the rest of their lives.

Because adaptive behavior skills, in general, tend to be complex skills, they may require potentially complex intervention. In those cases, interventions based on the principles of ABA (Baer et al., 1968) represent a set of evidence-based strategies with documented effectiveness in promoting the acquisition of adaptive behavior skills. These interventions include, but are not limited to, modeling, chaining, shaping, differential reinforcement, token economies, behavioral momentum, self-management, and functional communication training (FCT; Gerhardt & Lainer, 2011).

*Respectful Intervention and Meaningful Curriculum*

A meaningful curriculum is an essential component of a future life of dignity and respect. As Brown and colleagues (1979) noted, "The more functional skills individuals with disabilities have in their repertoires, the more they can do for themselves, the more privacy, choice and dignity they have and the fewer social, emotional, financially and other pressures they place upon others" (p. 4). Continuously evaluating goals to promote the most independence possible by imposing the fewest restrictions necessary to maintain safety is, therefore, recommended. Winett and Winkler (1972) warned against, "a rigid preoccupation with order and control and where children are required to be still, to be silent, and to obey" (p. 499). This warning is of increasingly greater importance as individuals age across the school years. Individuals have a right to instruction and support in exercising these freedoms, such as the right to choose and refuse and to make decisions about their goals and instruction (Bannerman et al., 1990).

Respectful intervention also includes ensuring that practitioner behavior, including the language used during instruction, promotes dignity. The way practitioners speak and behave toward the individual they support is of central importance in the instructional process. Recommendations include using language that the individual and/or their family prefers (e.g., person-first vs. diagnosis-first language), speaking directly to the individual when in front of them instead of about them, avoiding pejorative language (e.g., "low-functioning"), and speaking about people in a normative way (e.g., using respectful language like Ms./Mr. if it is customary in a given context; Reid et al., 2017). The form of respectful intervention needs to continually evolve to reflect the age of the student or client.

Providing intervention that is respectful of the learner also includes obtaining assent to treatment. While assent is considered an ethical obligation of many professionals including behavior analysts (BACB, 2022), as well as within medicine (Olszewski & Goldkind, 2018; Bakić-Mirić & Bakić, 2008) it is typically not well studied and difficult to define. Assent may be defined using terms like therapeutic alliance (e.g., Goldiamond, 1974) or rapport, but however defined, assent should include both vocal-verbal measures as well as behavioral indicators of agreement to intervention. While there is much work to be done in the development of methods of measurement of assent (Morris, 2021), as well as recommendations regarding how often to obtain assent and how to manage dissent in required intervention, the increased focus on, and discussion about assent in intervention is important and encouraging.

*Dignity of Short-term and Long-term Risk*

Within the context of a meaningful curriculum, individuals on the spectrum should be afforded what is known as the dignity of risk. Appropriate and reasonable risk-taking can and should be incorporated into a meaningful curriculum. For example, an individual will not acquire the skills necessary to independently navigate a mall if the instructional opportunity is never provided under the guise of personal safety or the absence of any advocacy for the skill to be taught. For some individuals with disabilities, concerns about balancing risk and benefit may be minimized when staff are well-trained in the assessment process (e.g., Driscoll et al., 2022). However, not providing instruction in meal preparation due to the possibility of the person burning themselves on the stove fails to take into account the frequency that neurotypical peers burn themselves or their food during cooking. Withholding access to risk is a way of infantilizing individuals with disabilities (Perske, 1972). As individuals move through school and, eventually, enter adulthood, practitioners need to include instruction in the competencies associated with managing dignity of risk to whatever extent possible while minimizing the possibility of harm or trauma. Clinical judgment (e.g., Leaf et al., 2019; Leaf, et al, 2016) including an in-depth understanding of the individual's learning history, family concerns and preferences, and individual preferences should be used as a guide.

Currently, the majority of adults on the autism spectrum remain dependent on their families and/or providers for the management of their hygiene, medical care, finances, home, and living, and daily living tasks (e.g., Howlin & Magiati, 2017; Roux et al., 2015; Shattuck et al., 2020). Adults with disabilities who live in staffed residences and attend day programs have less emphasis placed on highly qualified staffing support (Lowe et al., 1998; Gerber et al., 2011; Smidt et al., 2007;

Gormley et al., 2019) and some studies have shown that psychotropic drugs are frequently and excessively prescribed to manage challenging behaviors of adults diagnosed with autism with comorbidity of intellectual disabilities in residential settings (Robertson et al.2000; Deb et al., 2015; Bowring et al., 2017; Lim et al., 2021; Felce et al., 2011). Unfortunately, adults with disabilities are not often making decisions for themselves due to their perceived capacity, which is described by McSwiggen and colleagues (2016) as a judgment about the intellectual, decisional, effective, and practical skills to make a particular decision for a person's life, health, and wellbeing. When capacity is determined to be insufficient, a legal guardian is often tasked with making decisions on the behalf of the individual (Dudley & Goins, 2003).

Increasing independence in skill areas such as communication, safety, medical interventions, hygiene, meal planning and preparation, budgeting, and other useful skill domains can help support individuals to lessen or completely avoid dependency on others to make decisions for them in adulthood (i.e., build their capacity to make decisions themselves). In building these skills, individuals in supported environments can begin to take back independence and subsequently reduce relinquishment of decision-making to guardians, residential care providers, staff in workspaces and/or day programs, and even family members.

*Systems-Based Approach to Meaningful Programming*

Creating meaningful programming requires a sometimes significant shift in the current practices of a given learning environment. Significant changes in organizational settings often require a systems-based approach for success (e.g., Standen, et al, 2020). In order to develop a process that can support this, intentional moves generally need to be made at a myriad of levels of a school or school district (i.e., classroom, teacher, administration)

The administration level training on meaningful curriculum, including the practices discussed in this paper, should focus on school principals and/or executive directors. Gaining buy-in from director-level professionals is critical to promote a top-down implementation process. These strategies can help to develop a positive and inclusive school culture that prioritizes long-term outcomes.

The teacher level may be one of the most important pieces, given that this is the level where goals are written. Coaching and feedback can help to improve and shape behavior in teaching practices (Gavoni & Weatherly, 2019), which reasonably could include practices related to a focus on meaningful programming. The educational team supporting the teacher needs to play a role in identifying meaningful goals and the development of systems for data-based decision-making.

At the classroom/direct-care level, there are many practitioner (e.g., assistant teachers, paraprofessionals) behaviors that contribute to the practice of meaningful programming.

When instructors have the perception that they are effective in their teaching practice, this has been shown to have a large effect size related to positive outcomes for students (Hattie, 2013). Instilling the perspective that programming developed is going to meaningfully affect individuals' lives long-term can be a helpful addition to this perception.

**Summary**

The goal of any meaningful curriculum is to increase the student's personal independence across multiple environments. Personal independence can be defined as the degree of congruence (or match) between the skills in an individual's repertoire and the social, communication, social, safety, and mobility demands of the environment in which they live, work, or play. Typically developing individuals acquire these skills through a combination of in vivo modeling, shaping, chaining, trial and error, etc. Some more "specialized" skills (e.g., riding a bike, playing an instrument, doing the backstroke) may require a degree of formalized instruction combined with ongoing practice. For most people with autism, however, that naturalistic combination of processes is generally insufficient to acquire even basic skills.

Research (e.g., Dell'Armo & Tasse, 2019) indicates that individualized instruction in skills collectively referred to as adaptive behavior is associated with more positive outcomes in adulthood. Adaptive behavior, however, is an incredibly complex and diverse array of skills and behavioral competencies, the boundaries of which are defined by the intersection of age in years and the physical, geographic, socio-cultural, economic, personal, and health-related demands of the environment. This is at the core of meaningful curriculum and respectful intervention.

Various aspects of a meaningful curriculum and respectful intervention have been laid out in some detail earlier in this paper. However, there is a meaningful curriculum "hack" that has not been discussed, and that is the use of the phrase "in order to." When writing instructional goals or objectives end the goal with "in order to" and then complete the sentence. For example, Jeremiah is a fictional 13-year-old who lives in a rural community. Jeremiah has co-occurring diagnoses of autism and an ID. An instructional goal for may be "Jeremiah will independently ride a 2-wheeled bicycle for a minimum of 60-minutes." As that stands it would appear to be a very time-intensive instructional

goal. However, if we add a completed "in order to," we end up with, "Jeremiah will independently ride a 2-wheeled bicycle for a minimum of 60-minutes in order to join his family on long bike rides and promote a healthy lifestyle as he ages." This addition explains in plain language why this goal could be considered meaningful to Jeremiah.

On the other hand, if Jeremiah had the goal, "Jeremiah will balance his checkbook using the bank provided ledger and a calculator in order to..." In order to what? To do something in the most difficult way possible when using an app or downloading an account statement online would provide the same outcome much more quickly and easily? Just as importantly, assume Jeremiah masters the calculator goal, where does the skill go next? Does he report a negative balance to a parent? Does he advocate at the bank to correct their error? Or, maybe, he then transfers money from one account to another to cover the deficit? In any case, the addition of "in order to" works to assist parents, teachers, and other educational professionals to identify initial goals and propose the long-term application of the goal in a meaningful way. As was stated earlier, this is presented as a hack and not a fool-proof method. Neither should it be considered a substitute to the recommendations provided earlier in this paper.

Effective intervention requires the merging of evidence-based practice and intervention with individualized, meaningful curriculum applied in the right context. While the concept of meaningful curriculum has significant face validity (i.e., it makes sense), the research base in support of this approach remains at an early stage. However, until that research is available, it is probably worth repeating that "teaching the wrong skills well is no better than teaching the right skills poorly." In general, the field of education and related services is good at increasing skill proficiency. Now we need to be proficient with targeting the right skills.

**Footnotes**

[1]A note about terminology: throughout this paper, the terms "autism," "on the autism spectrum," "ASD," "person with autism," and "autistic person" are used interchangeably. While the authors recognize that amongst the clinical, medical, and neurodiverse community there are preferences and conventions in terminology use, the selection of terminology in this paper is based on grammar and stylistic needs and does not reflect a particular terminological intent.

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# Leading with Compassion: A Discussion and Steps Forward for Behavior Analysts

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## Abstract

The provision of applied behavior analytic (ABA) services is a highly efficacious intervention approach most often used to improve the lives of individuals with autism spectrum disorder (ASD)/Autistics. Given the advancement of the field, more nuanced skill sets of behavior analysts, such as compassionate care skills, are emerging as the focus of intervention as measurable, observable, and essential. As the field progresses, the identification, refinement, and assessment of more nuanced skills become crucial to the success of our interventions. Leading with a compassionate approach that balances habilitation with client happiness, assent, and engagement is of the utmost importance. This paper discusses the current trend in existing compassionate care literature and how those evaluations may potentially be extended to direct interventionists and Registered Behavior Technicians. In this paper, we argue that a behavioral framework should be used to conceptualize, train, and evaluate the demonstration of these skills in front line ABA practitioners.

**Keywords:**

Compassion, Autism, Happiness, RBT, Interventionist, ABA

## Introduction

Applied behavior analysis (ABA) can be described as inherently compassionate (Baer et al., 1968). It is important to recognize that the science of behavior analysis is compassionate. However, the implementation of interventions informed by the science requires measures of social validity to verify social significance of the interventions. Measures of compassion in the provision of ABA-based services can aid in the evaluation of the social validity of interventions. Compassion has been defined as a direct action that is delivered to alleviate the suffering of another individual (Taylor et al., 2018). The provision of ABA-based intervention is a direct action (i.e., service) that may potentially alleviate perceived challenges of the individual or family and improve the lives of those we serve. While the idea of compassion in service delivery is not a new concept (e.g., Bannerman et al., 1990; Leaf & McEachin, 1999; Taylor et al., 2019; Wolf, 1978), there has been an increased focus and discussion on embedding it further into practice related to ABA-based interventions for individuals with autism spectrum disorder (ASD).

In an effort to better serve clients and families as well as improve collaborative relationships, compassionate care has taken a front seat in behavior analytic discussion, training, and research (Chadwell et al., 2018; LeBlanc et al., 2019; Taylor et al., 2018). Individuals most frequently responsible for the direct implementation of ABA-based interventions for individuals with ASD or intellectual disabilities (ID) are Registered Behavior Technicians (RBTs; Behavior Analyst Certification Board, n.d.). The RBT is an individual who has met the knowledge and competency requirements for certification from the Behavior Analyst Certification Board (BACB). These individuals are often the face of ABA-based intervention for autism (BACB, n.d.). It is imperative that these individuals are compassionate, caring, technical, and collaborative. In this paper, we will discuss broad issues of RBT certification and training that lead to future areas of improvement in the field of behavior analysis. We will also suggest potential remedies for contexts in which there is a deficit in compassionate care. We also propose that all behavior analysts must first lead with compassion to better serve our clients and families, as well as to improve the broad perception of the application of our science. At the same time, it is important to identify how practitioners, especially RBTs can balance compassionate care with habilitation and how effective instruction can co-exist with humane and compassionate intervention.

Perhaps one of the most recent examples of leading with compassionate care has been the work of Hanley and colleagues as it relates to the Practical Functional Assessment (Hanley et al., 2014), Skills Based Treatment (Ghaemmaghami et al., 2015; Iannaccone & Jessel, 2021), and the use of Universal Protocols (Ghaemmaghami et al., 2016; Rajaraman et al., 2022). These procedures are described as ways to implement behavior analytic principles while being guided by compassion and trauma-informed care. Happy, Relaxed, and Engaged (HRE) is a concept and practice used as a way to measure the child's enjoyment and assent with the program that is incorporated into skill-based treatment (Ghaemmaghami et al., 2021). HRE requires that the staff member operates in ways that produce reinforcement for the individual, thus engaging in direct actions to alleviate the suffering of that individual, which gets to the heart of compassion. There has also been an increased focus on how our interventions may impact individuals with ASD. For example, Rajaraman et al. (2022) outline ways in which behavior analysts may conceptualize and incorporate trauma-informed practices into the daily implementation of ABA. They discussed future recommendations for BCBAs to incorporate trauma-informed care into practice by 1) acknowledging that potential trauma exists, 2) creating environments rich in reinforcement that promote safety and trust, 3) including potential opportunities for choice as much as possible, and 4) creating intervention programs that focus on the building of adaptive skills that will have a meaningful impact on the individual's life (Rajaraman et al., 2022). Not only are these strategies helpful in the potential reduction of trauma, but they also may help foster a compassionate relationship between the therapist and the individual.

Additionally, Ramey et al. (2022) sought to define "happiness" in individuals with ASD by replicating a previously established procedure by Parsons et al. (2012). Ramey et al. demonstrated that while it may often be a difficult concept for behavior analysts, happiness and unhappiness can be defined and agreed upon by observers. Ramey et al. defined indices of happiness and unhappiness for each participant based on questionnaires and validated those by creating happy and unhappy conditions. Percentages of idiosyncratic happiness and unhappiness were measured in each condition. The results highly correlated with the results on the questionnaires. This is a wonderful step in the right direction for the operational definition and measurement of emotional states for individuals with ASD. With these tools readily available in the literature, it is now time to add them to daily practice to ensure the social validity of our procedures.

The Circumstances View of Behavior as described by Friman (2021) is a description and/or explanation of how the field of behavior analysis is rooted in compassion. Friman explained that behavior, as viewed through the eyes of radical behaviorism, is a function of the circumstances of the individual. Often, other explanations of behavior would describe behavior as a part of the person and place blame on an individual when they engage in a behavior that is undesirable by society (e.g., commit a crime). However, behavior analysis would explain this behavior as a function the environment and the past reinforcement and punishment histories for that individual. Behavior analysis does not blame individuals, but rather, explains the behavior in the context of the individual's experience of the environment. Thus, behavior analysis by its very definition exemplifies compassion.

Behavior analysts place a high value on the use of evidence-based treatments and are committed to effective intervention. The commitment to effective intervention may have led to some challenges when working in interdisciplinary teams, and thus behavior analysts have faced criticism regarding collaboration (Leaf et al., this issue; Rohrer et al., 2021). Allied professions have expressed that behavior analysts can seem arrogant, dismissive of other perspectives, or rigid (e.g., Gaswieski et al., 2021; Gerenser & Koenig, 2019; Koenig & Gerenser, 2019; Schiebel & Walting, 2016; Welch & Polarajko, 2016). A primary related concern has

been the use of behavioral jargon; members of allied disciplines may not understand technical terms such as the terms such as tact and intraverbals (Critchfield, 2017). There are often dual uses of other terms, such as punishment. In either context, there may be a gap in understanding for nonbehavioral professionals. Additionally, behavior analysts must adhere to the Ethical Code for Behavior Analysts (BACB, 2020; Cox, 2019) which requires, amongst many other things, that behavior analysts support and only recommend evidence-based practices and procedures. This often leads to issues with non-behavioral colleagues, who may feel that their recommendations are dismissed because the procedures they are recommending are not yet evidence based. Behavior analysts may be attempting in these interactions to adhere to the ethical code; however, they may not possess the nuanced interpersonal skill set that would enable meaningful dialogue and effective compromises. Alternate certifications and allied professions also mandate adherence to ethics codes (e.g., American Psychological Association, American Speech/Language Hearing Association, American Occupational Therapy Association, Council for Exceptional Children). The complexities of autism require the expertise of multiple disciplines, and outcomes are enhanced through a multidisciplinary model (e.g., LaFrance et al., 2019; Slim & Rueter-Yuill, 2021). The importance of enhancing collaborative skills among behavior analytic practitioners has been strongly emphasized within the field, especially recently (Brodhead, 2015; Bowman et al., 2021). Such skills are important for all collaborative relationships, including those with families, allied professionals, and clients (Weiss et al., 2022). The discussion around compassionate care in ABA has mainly been focused on the master's level clinicians. Given that RBTs/practitioners likely encounter families and children frequently, we will outline how the provision of compassionate ABA can be extended to the RBT/practitioner level.

### *Direct Implementation of ABA-based Interventions in Autism Treatment Settings*

RBTs are most often the direct, client-facing, interventionists responsible for the implementation of ABA-based interventions with individuals diagnosed with ASD/Autistics (BACB, n.d.). These professionals are required to complete, at minimum, 40 hr of training, pass a competency assessment, as well as pass a standardized knowledge exam (BACB, n.d.). RBTs are also required to be supervised for at least 5% of working hours to ensure accurate and precise implementation of the treatment program and to maintain certification. Early in the development of the field of ABA, practitioners were few and the field was very small. Given the extensive growth of the field, there has been a drastic and almost exponential increase in credentialed professionals (BACB, n.d.). Today, the RBT credential requires a high school diploma and the previously listed criteria. It should be noted, however, that some have suggested that these minimal standards may result in insufficient competency and knowledge of our most forward-facing interventionists responsible for implementing behavior analytic procedures (Leaf et. al., 2021).

The role of the RBT is multi-faceted as they are crucial to the outcomes produced for learners. They must build rapport with the individual, implement various teaching protocols (e.g., functional communication training, discrete trial teaching, naturalistic teaching), collect various forms of data (e.g., antecedent-behavior-consequence, rate, interval), navigate mealtimes, toileting procedures, and more all while responding to all of the child's needs. When learning various protocols, it may be easiest for the staff member to implement clearly outlined procedures to increase procedural fidelity. Arguably, the best implementation of all above listed procedures involves clinical judgement on the part of the RBT (Leaf et al., 2016). For example, consider the application of differential reinforcement. This concept and practice require that one does not reinforce undesired behaviors or only reinforces desired behaviors (Vladescu & Kodak, 2010). Differential reinforcement, when implemented precisely, leads to great gains in skills and improvement in overall functioning (Vladescu & Kodak, 2010). Quality application of differential reinforcement requires that the staff member analyze the behavior of the individual and respond accordingly with varying amounts/levels of reinforcement contingent on various responses. However, without clear oversight, feedback, and a solid understanding of the implementation of differential reinforcement, the RBT may be prone to a variety of errors. For example, they might miss opportunities to reinforce better articulation or social bids that are especially clear to peers. In the context of challenging behaviors, they may exhibit "cold" reactions when the child engages in emotional behavior, which could disrupt rapport. As an illustration, when given the instruction, "do not reinforce that behavior," the RBT may rigidly interpret that as an instruction to ignore the child completely without regard for the behavioral function or emotional state of the individual. This could lead to a rigid interpretation of the behavior plan and result in less in-the-moment assessment and responding compassionately to the child across various situations. Rigid implementation of ABA can potentially lead to less compassionate responses (e.g., staff simply following plans rather than responding to the child and altering their own behavior). Implementation at a high degree of treatment fidelity does not need to be mutually exclusive to the application of compassionate care. The RBT is the

primary interventionist can respond compassionately and flexible to the child while applying the required underlying behavioral principles.

*Compassionate Care as a Soft Skill*

Board Certified Behavior Analysts (BCBAs) commonly receive little instruction on soft skills and how those may interact with the relationship between stakeholders (Rohrer et al., 2021). One potential reason for this may be that traditionally these skills have been viewed as challenging to operationalize and, thus, teach. No professional tools nor guidelines exist to support behavior analysts work in this area. Further, coursework and other formal education in behavior analysis historically has placed great emphasis on a technical understanding of the science. The field has begun to address these gaps and to look to remedy any lack of training or behavioral deficits (LeBlanc et al., 2019, Rohrer et al., 2021). Most of this work has focused on the interactions between professionals and/or professionals and caregivers. For example, Rohrer et al. (2021) suggested a checklist to evaluate the interaction between the BCBA and caregiver during interactions. The Compassionate Collaboration Tool utilized a 3-point Likert scale to assess the interactions that included both compassionate interactions married with collaborative behaviors. The need for advancement in this research and skill set is vast and essential. The field of behavior analysis will be greatly improved by the development of instructional approaches that target these skills. Alongside this effort, we must begin to develop measures of the direct interaction of therapists (RBTs or otherwise) with the recipient of the service. As the ultimate beneficiary of service and as the primary focus of intervention, the clients served must be consistently met with humane and compassionate care. At the present time, there is a paucity of published literature that focuses on interpersonal skills and other soft skills that may be important for RBTs to demonstrate. Further, there are very few resources on evaluating the extent to which compassion is integrated into their training.

*From Identification to Practice*

It has been noted that some practitioners in the field of behavior analysis are lacking in compassionate care behaviors or skills (LeBlanc et al., 2019, Rohrer et al., 2021; Rohrer & Weiss, 2022; Taylor et al., 2018), especially in the context of the parent-professional relationships. It is important that this work is also extended to client-instructor interactions. Practitioners must continue to lean on previous research (e.g., Baker, 2013; Harris & Weiss, 1997) and continue to develop behavioral measures of these interactions as well as develop behavioral measures of authentic or genuine interactions. Measures of authenticity will allow professionals to make better decisions regarding efficacious training techniques as well as improve our intervention quality.

Given that behavior analysts should evaluate compassionate interactions using a behavioral framework, they should also train RBTs to use a behavioral framework when working with individuals with ASD (Leaf et al., 2021). This will better inform the RBT on how, when, why, and under what circumstances to flexibly respond to the individual during times of high stress or concern. Compassionate behaviors are just that, behaviors. These behaviors are measurable, observable, and trainable; similarly, interventions can be evaluated to increase or decrease those behaviors. While measuring aspects of behaviors such as the extent to which a behavior is genuine or authentic may prove to be quite challenging, it is imperative that we do so to achieve best outcomes and high consumer satisfaction.

Rapport building between clinicians and caregivers of people with ASD may be facilitated through training in compassionate care (LeBlanc et al., 2019; Taylor et al., 2018). For example, Marchese (2021), in an unpublished dissertation, developed and evaluated seven instructional modules to support training graduate students in compassionate care skills. A modified behavioral skills training package was implemented across each module that included a pre-test, online PowerPoint presentation (i.e., sample of the literature, modeling on how to display various compassionate care skills), active rehearsal of target skills via homework assignment, feedback on the assignment, and a post-test. The modules were delivered via a class wide training format. Results were compared to a second control group of students who did not access the training module nor the homework assignment. The control group only completed the pre- and post-tests. Overall, students in the experimental group demonstrated statistically significant increases in knowledge (i.e., post-test scores across modules) and performed well on the behavior component of the instructional modules. This study provides a preliminary demonstration that compassionate care training can be integrated within a class wide training format.

Assessment tools may also be used to support the application of compassionate care skills within clinical environment. Marchese (2021) undertook a multi-step approach to develop the Parent Partnership Questionnaire (PPQ), a tool to support collaboration between parents of children with autism and their clinician. The development included a content creation phase that involved conducting semi-structured interviews with parent of children with autism, an online survey for parents to give feedback on the clarity and understanding of questions within

the draft tool, and finally procedural integrity checks and reliability testing were conducted on the final version of the tool. The PPQ outlines various open-ended questions for clinicians to ask parents to gain an understanding of their priorities, values, and potential logistical considerations that may ultimately facilitate parent engagement. It is hypothesized that the administration of this tool allows clinicians to gather information from parents while developing rapport between both parties. The PPQ may offer clinicians a structure to support the application of compassionate care skills in clinical setting. The development of tools like the PPQ will offer the field more ways to better operationalize, measure, evaluate and teach skills relating to therapeutic relationships and compassionate care.

We are hopeful that the BACB will expand consideration for soft skills on the next task list for RBTs. The current task list outlines that the RBT adheres to all elements of the Ethics Code which includes behaviors like compassion and elements of soft skills. One potential consideration for expansion is to include fluency or demonstration of soft skills in the current 5th edition task list (BACB, 2021). This may facilitate the advancement of our field, the general perception of our practice and most importantly client and family outcomes. There have already been steps toward this in the research as evidenced by Rohrer and Weiss' (2022) preliminary investigation. Specifically, Rohrer and Weiss first identified empathetic and compassionate skills, then subsequently divided them into three categories that could be measured, observed, and evaluated. The skills identified were interviewing skills, interest in the family, and joining the family. Using behavior skills training, the researchers taught four master's students in behavior analysis these skills via telehealth. The results were promising in that all participants improved in engagement, social validity measures, and other standardized forms of measurement from other fields (e.g., the Jefferson Scale of Physician Empathy). All participants in this study had bachelor's degrees and were earning master's degrees in behavior analysis (Rohrer & Weiss, 2022). An important extension of this research would be to expand this research to the RBT level. Specifically, such training could target areas of interaction between the RBT and the family and/or child. It is essential as the field that this concept be extended to interactions between the client and the instructor/RBT.

Table 1 provides a suggested process for the evaluation and analysis of compassionate interactions when incorporated into in-the-moment decision making by BCBAs and RBTs. When using this approach to every interaction, the BCBA or RBT may be better equipped to analyze and alter their behavior given various situations. This is not a new concept, as this closely resembles the antecedent-behavior-consequence evaluation procedures (Cooper et al., 2019). This is a hallmark of ABA intervention and is easily applied to situations that would improve compassionate behaviors on the part of the RBT. This simple framework could aid the RBT in evaluating their own behaviors relating to the nature of the interaction between child and therapist and in identifying how their behavior is impacting the emotional state of the child. The therapist could then more thoroughly respond to the child in a way that is intentional and leading with a compassionate approach. When using this approach, the RBT can learn how to best answer questions in times of calm interactions (e.g., the child is engaged, assenting to learning opportunities, seems content with interactions from the therapist) and when to alter responses in times of crisis (e.g., severe problematic behaviors, refusal to complete tasks, minor problematic behaviors).

Table 2 provides an expansion of Table 1 that outlines some potential examples of situations the RBT may encounter. In the example of the calm situation, specific behaviors are listed that lead the therapist to believe the child is in a calm state. The response is outlined, as well as an analysis of how the therapist response did or did not change the behavior of the child. In the crisis, clear behavioral descriptors are present, the response is clearly described, and the analysis of the response allows the therapist to observe that the behavior was improved. Often, RBTs are provided only with consequence procedures and not with the analysis of how that response impacted the child's behavior. In addition, RBTs may not be trained in analyzing antecedent conditions at this level. Indeed, the skill set should include understanding indices of unhappiness (Ramey et al., 2022), and identifying when the client is no longer happy, relaxed, and engaged. This is not to suggest that practitioners should abandon consideration the function of the challenging behavior nor function based treatments. That is, careful consideration of the potential contraindicative intervention strategies must be included in application of compassionate care skills. Effective intervention can include both the application of compassionate care and what is needed to facilitate meaningful skill building. One is not mutually exclusive of the other. This framework includes evaluation of both the response to the client within the framework of compassionate care and what is therapeutically appropriate to build skills while reducing challenging behavior. For example, the RBT can learn how to embed learning opportunities, progressively shift schedules of reinforcement, and differentially respond to the client while ensuring the client well cared for both emotionally and physically.

**Table 1**

*A process for evaluation and analysis of compassionate interactions.*

| Situation | Behaviors | Response | Analysis |
|---|---|---|---|
| Identify the situation that is potentially causing stress or enjoyment to the individual | What behaviors are you seeing that lead you to believe this? | What are some potential acceptable responses to this behavior provided the behavior plan and training? | How does my behavior improve or worsen the condition of the individual? |

**Table 2**

*A process for evaluation and analysis of compassionate interactions - Examples*

| Situation | Behaviors | Response | Analysis |
|---|---|---|---|
| Identify the situation that is potentially causing stress or enjoyment to the individual | What behaviors are you seeing that lead you to believe this? | What are some potential acceptable responses to this behavior provided the behavior plan and training? | How does my behavior improve or worsen the condition of the individual? |
| Examples | | | |
| Calm: playing with the RBT | Steady eye contact; approaching therapist; occasional smiling | Continue with activity; increase learning opportunities; | My response led to the continuation of calm behaviors; reassess if any behavior changes |
| Crisis: provided task demand, removed play materials | Crying; avoidant of task materials; flat affect | Preference assessment; label potential emotional state; provide additional choices | My response improved the state of the child; child began approaching me calmly |

## Summary

To date, the literature addressing the improvement and refinement of compassionate care skills in behavior analysis has largely been limited to that of parent/caregiver and professional (e.g., BCBA) interactions. We strongly believe this focus must also include addressing the soft skills of direct care interventionists at the RBT level. There has been significant growth in the identification of behaviors that may comprise a definition of compassionate skills (LeBlanc et al., 2020; Marchese, 2021; Melton et al., in press; Rohrer & Weiss, 2022; Taylor et al., 2018). Further research should refine and extend these investigations to direct interventionists. The field of behavior analysis at its very core is compassionate, and there has been a resurgence of interest in how this core value can be enacted consistently in practice (e.g., Baer et al., 1968; Bannerman et. al., 1990; Friman, 2021; Foxx, 1996; Rohrer et al., 2021; Taylor et al., 2019; Wolf, 1978). As the field progresses, the identification, refinement, and assessment of more nuanced skills is crucial to the success of our interventions. Leading with a compassionate approach that balances habilitation with client happiness, assent, and engagement is of the upmost importance. A compassion-based approach will advance the partnership between professionals and clients and will ensure that we are held accountable in making socially significant differences that are validated by those we serve.

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# A Summary of the Recommendations to Increase Cultural Responsiveness in the Field of Applied Behavior Analysis

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## Abstract

Cultural contingencies help shape the development of an individual's behavioral repertoire. Researchers within field of behavior analysis have, within the past decade, reiterated the importance of connecting behavioral principles to a client's cultural practices. The incorporation of cultural preferences within behavioral services is paramount to the effectiveness and sustainability of those services. The present paper summarizes the guidance of researchers for practitioners beginning to develop this repertoire and apply it to their clinical practice. This paper begins by acknowledging that the foundation of the field of applied behavior analysis set the stage for understating how cultural considerations make the field applied. Different themes related to increasing the cultural responsiveness of the field are summarized by reviewing the supporting literature. The research is further summarized into guiding principles for practitioners as they begin to sharpen this skill. The paper ends with a call for scientist practitioners and researchers to capture data related to culturally responsive service provision to inspire efforts in empirical evaluation of the recommendations provided.

**Keywords:**

Cultural Responsiveness, Cultural Humility, Cultural Awareness, Applied Behavior Analysis

## Introduction

Culture is the backbone of the science of behavior analysis. Differentiation in cultures forms as the result of interactions between individuals which result in specific specific repertoire being shaped by social consequences (Glenn, 2004). These interactions are responsible for a large portion of human learning and the combination of consequences over time within a specific context is what makes a culture unique (Glenn, 2004). The cultural identity of specific group of individuals will determine behavioral nuances that are considered appropriate or inappropriate (e.g., shaking hands as a greeting, avoiding direct eye contact, hugging when welcoming a grandparent). Understanding the existing cultural repertoires of a family, community, or social group gives a behavior analyst a starting point to develop a client-centered intervention plan. An emphasis on culture is a necessary component of behavior analytic intervention because cultural responsive

intervention practices can more readily support the naturalistic reinforcement of beneficial behaviors (Neely et al., 2020).

Researchers have given the field a foundation upon which to start developing culturally responsive repertoires to serve diverse populations (Arango & Lustig, 2022; Beaulieu et al., 2019; Conners & Capell, 2021; Fong et al., 2016; Fong et al., 2017; Fong & Tanaka, 2013; Gatzunis et al., 2022; Jimenez-Gomez & Beaulieu, 2022; Kirby et al., 2022; Mathur & Rodriguez, 2021; Najdowski et al., 2021; Wright, 2019). The recent adoption of the new Ethics Code for Behavior Analysts (referred to as "the ethics code" here after) outlines that incorporating cultural considerations into clinical practice is not only recommended, but required if a certified behavior analyst is in compliance with this code (Behavior Analyst Certification Board {BACB}, 2020). Arango and Lustig (2022) identified specific areas within the ethics code that pertain to cultural responsiveness. Within the Core Principles section, the code requires the equitable treatment of clients and stakeholders, "regardless of factors such as age, disability, ethnicity, gender expression/identity, immigration status, marital/ relationship status, national origin, race, religion, sexual orientation, socioeconomic status, or any other basis proscribed by law" (BACB, 2020, p. 4). Also, within the Core Principles the ethics code outlines that certified behavior analysts should continuously make efforts to increase their own scope of competence related to serving clients of diverse backgrounds (BACB, 2020). The same themes are reflected in the ethical guidelines for members of the American Psychological Association (APA) and the American Occupational Therapy Association (AOTA; AOTA, 2020; APA, 2017). The ethical guidance from both organizations places an emphasis on making efforts to understand and preserve an individual's cultural identity when providing services. The focus on cultural components across fields that often interact with one another affirms the importance of these considerations. As Arango and Lustig (2022) remind us, an ethical approach to serving multi-cultural clientele is one that takes into consideration the relevant contextual variables within a family's environment as well as the family's treatment preferences.

While practitioners await further recommendations within this area, they also anticipate the empirical evaluation of these suggestions. Specifically, identifying the suggestions that are most valuable for supervisors, practitioners, researchers, and organizations to invest resources into. This paper will reflect on the foundations of applied behavior analysis (ABA) and how those who were present during the field's inception set the precedent for exploring this important issue. Main themes and recommendations surrounding cultural responsiveness will be outlined with supporting articles identified for each theme. A review of the few empirical demonstrations of developing a culturally responsive repertoire will be discussed and recommendations for future researchers will be given. Finally, the recommendations of some of the most cited articles which focus on cultural considerations will be combined to give practitioners guiding principles as they begin developing this repertoire. It is the intention of this paper to serve as a starting point for practitioners who recognize the importance of developing a culturally responsive practice but are unsure where to start within the literature. An additional goal is to encourage scientist practitioners and researchers to conduct empirical investigations on this topic to further guide the field of applied behavior analysis in these efforts.

The terms used throughout this paper as well as other terms related to cultural responsiveness are outlined in Table 1 to assist readers in discriminating between terms. Articles that describe these terms are cited within the Table. Differentiation between terms is found throughout the published literature on the topic of cultural responsiveness (Gatzunis et al., 2022; Mathur & Rodriguez, 2022); therefore, for the sake of clarity, the terms used frequently within this paper are clearly outlined. Cultural responsiveness will be used when discussing overall incorporation of family preferences, values, and cultures into clinical work (Mathur & Rodriguez, 2022; Miller et al., 2019). When referring to verbal behavior surrounding one's own biases and how this might affect practice, the term cultural awareness will be used (Arango & Lustig, 2022; Fong et al., 2016; Gatzunis et al., 2022; Martinez & Mahoney, 2022). Cultural humility will refer to the ongoing development and improvement of an individual's cultural awareness (Gatzunis et al., 2022; Jimenez-Gomez & Beaulieu, 2022; Kirby et al., 2022; Martinez & Mahoney, 2022; National Institute of Health, 2020).

### Connection to the Origins of ABA

The science of ABA has long been one that values client input and incorporates client preferences (Baer et al., 1968; Wolf, 1978). An emphasis on embracing the preferences of those we work with is not new for the field of behavior analysis. Baer and colleagues' (1968) seminal article describes that the behaviors chosen for intervention should be important to the individual affected by intervention. Baer and colleagues (1987) updated and expanded this original call for socially significant behavior change by reminding readers that social significance can be determined by both the individual experiencing intervention as well as those who support them throughout the experience (i.e., those who have likely helped shape the individual's cultural identity). Several current publications have linked the foundational dimensions described by Baer et al. (1968, 1987) to a culturally responsive approach

**Table 1**

*Common Terms Used in Discussions of Cultural Responsiveness in Human Services, Behavior Analysis and the Medical Field*

| Term | Definition | References |
|---|---|---|
| Culture | "The extent to which a group of individuals engage in overt and verbal behavior reflecting shared behavioral learning histories, serving to differentiate the group from other groups, and predicting how individuals within the group act in specific setting conditions" (Sugai et al., 2012, p. 200). | Sugai et al., 2012 |
| Cultural sensitivity | Recognizing and embracing differences between the practitioner's cultural background and that of their clients. Understanding how this background can create biases and working these realizations into clinical practice and interactions. This process takes place both at an individual and organization-wide level. This term is often used to reflect verbal behavior that tacts cultural differences as well as overt behaviors that incorporate accommodations for those differences in service provision. | Arango & Lustig, 2022<br>Gatzunis et al., 2022<br>Martinez & Mahoney, 2022 |
| Cultural Competence | The repertoire of behaviors, policies, and values that are combined within an organization to allow professionals to work effectively across culturally diverse situations. This term is often used to describe the group of actions an individual or organization has taken to create systematic change. When discussed, authors describe culturally competent organizations as those that impact large, community systems by creating policy change, systems changes, and advocating for disadvantages populations. This term has not been used recently to reflect an individual's behavior as it conveys an idea of reaching a level of "mastery". | Arango & Lustig, 2022<br>Fong & Tanaka, 2013<br>Miller et al., 2019 |
| Cultural Awareness | Often describes as verbal behavior. An individual can tact the differences between their cultural backgrounds and that of their clients and can also name the ways that these two backgrounds may be different and how those differences could affect services. | Arango & Lustig, 2022<br>Fong et al., 2016<br>Gatzunis et al., 2022<br>Martinez & Mahoney, 2022 |
| Cultural and Linguistic Diversity | "(T)he social (cultural) differences between groups that may control verbal behavior" (Brodhead et al., 2014, p. 76). | Brodhead et al., 2014, p. 76 |
| Cultural Humility | Describes ongoing process of evaluating and modifying one's own behavior following interactions with individuals of backgrounds different than one's own. Continuously increasing openness to different viewpoints. The process of continuously improving upon one's own cultural awareness. | Gatzunis et al., 2022<br>National Institute of Health, 2020<br>Jimenez-Gomez & Beaulieu, 2022<br>Kirby et al., 2022<br>Martinez & Mahoney, 2022 |
| Culturally Responsive Teaching | Incorporating the diverse experiences of both a student and faculty population into a program's curriculum to ensure equitable educational experience for all students, regardless of background. | Gatzunis et al., 2022<br>Jimenez-Gomez & Beaulieu, 2022, Miller et al., 2019 |
| Cultural Reciprocity | The process of evaluating ongoing interactions between individuals of differing cultures. Making changes and compromises in line with each party's values as needed. | Kirby et al., 2022 |
| Cultural Responsiveness | The process of collaboration with clients and stakeholders to ensure intervention is reflective of the client's values and goals. Involves combining a cultural awareness repertoire with actively listening to the values and preferences of clients. | Mathur & Rodriguez, 2022<br>Miller et al., 2019 |
| Culturally and Contextually Relevant | Used when discussing educational curricula and materials and describes designing these supports to ensure that each student can experience the maximum amount of benefit from what is developed and taught | Sugai et al., 2012 |

Note: The terms above have been defined based upon either direct quotes from authors studying a specific topic or from a combination of authors describing a specific term. The terms used most often throughout the current paper will include cultural responsiveness, cultural humility, and cultural awareness.

**Table 2**

*Content Areas Related to Cultural Responsiveness and Relevant Citations*

| Area of Interest | Publications that Offer Recommendations |
|---|---|
| Developing One's Own Culturally Responsive Repertoire | Arango & Lustig, 2022<br>Dennison et al., 2019<br>Fong et al., 2016<br>Fong et al., 2017<br>Gatzunis et al., 2022<br>Machalicek et al., 2021<br>Neely et al., 2019<br>Wright, 2019 |
| Developing Culturally Responsive Educational and Organizational Systems | Fong & Tanaka, 2013<br>Mathur and Rodriguez, 2021<br>Nadjowski et al., 2021<br>Sugai et al., 2012 |
| Cultural Considerations in Supervisory Relationships | Gatzunis et al., 2022 |
| Guidance for Cultural Sensitivity in Family Interactions, Assessment, and Protocol Development | Beaulieu & Jimenez-Gomez, 2022<br>Dennison et al., 2019<br>Jimenez-Gomez & Beaulieu, 2022<br>Martinez & Mahoney, 2022<br>Rohrer et al., 2021<br>Neely et al., 2020<br>Tereshko et al., 2022 |
| Cultural Considerations in Research Procedures | Ruzycki & Amhed, 2022<br>Syed et al., 2023 |
| Commentaries on Culture in Behavior Analysis | Arango & Lustig, 2022<br>Brodhead et al., 2019<br>Conners & Cappell, 2021<br>Fong et al., 2017<br>Hayes & Toarmino, 1995<br>Miller et al., 2019<br>Lechago, 2022<br>Wright, 2019 |

Note: A sampling of literature across different areas related to cultural responsiveness in behavior analysis. This table is meant to serve as a guide for practitioners/researchers beginning to develop repertoires related to cultural responsiveness.

to services (e.g., Beaulieu et al., 2019; Brodhead, 2019; Fong et al., 2016; Jimenez-Gomez & Beaulieu, 2022; Mathur & Rodriguez, 2021; Neely et al., 2020; Sugai et al., 2012; Syed et al., 2023; Wright, 2019). Baer and colleagues described that what sets the science of behavior analysis apart from similar ones is its applied nature which aims to make behavioral changes that are significant for the learner in their natural environment. An efficient and collaborative way of determining the importance of goals is to discuss them in collaboration with the client and take into consideration the client's specific context and the ongoing contingencies that will support whether the goals are likely to maintain. Baer and colleagues (1968, 1987) also identified that behavior analysts are analytic in their work. Culturally aware practitioners demonstrate this dimension by understanding the variables within a client's environment that sustain behaviors and might support behavior change (Baer et al., 1968; Brodhead, 2019). If client context is not taken into consideration, a behavior analyst might miss the influence of these variables. Not including a family's cultural background into behavior analytic decisions would be, as Brodhead (2019) describes, "incongruent with our core value of being analytic" (p. 828).

The importance Baer and colleagues (1968, 1987) placed on social significance in ABA has not recently been reflected in the field's published work. Ferguson and colleagues (2018) conducted a review of the Journal of Applied Behavior Analysis that assessed whether studies evaluated social significance in research by collecting measures of social validity. The results indicated that, from 1999-2004 only between 3-7% of articles assessed for social validity in some form. This number increased only slightly from 2007-2016 with an average 13% of articles reporting social validity measures. One dimension of social validity that closely aligns with culturally responsive intervention is the selection of goals based on their importance for the learner. Ferguson and colleagues reported that this dimension was the least likely evaluated throughout the articles reviewed. This lack of focus on input from clients and stakeholders could lead the

non-behavior analytic community to believe that ABA has strayed from its original intention of putting clients at the center of services.

This potential stray from incorporating client preferences and cultural differences into practice may stem from an over-generalization of the understanding that behavioral principles are universally applicable (Hayes & Toarmino, 1995). This might mean that practitioners create goals based on responses they see as socially concerning, but do not follow through by discussing these goals with the individual or their family. The goal is targeted because the analyst is confident that the behavior can be changed given the universal principles of behavior. However, Hayes and Toarmino (1995) explain that the most thorough analysis of a specific behavior will include analysis of the relevant components of the individual's cultural identity. An understanding of a client's culture can inform practitioners of a myriad of details important to programming (e.g., existing environmental arrangements, cultural norms, existing sources of reinforcement). Goldiamond (1974) described a constructional approach to the field of behavior analysis as one in which the learner's current repertoire is always the starting point in goal development. A culturally responsive program would take this same approach in incorporating a family's priorities and existing repertoires into intervention and building skills from there (Goldiamond, 1974).

The importance of considering the diverse background of families is amplified by the immense changes occurring in the cultural makeup of countries. The most recent United States Census reflects the rapidly changing demographics of the country. The 2020 census estimates that non-White individuals make up 38.4% of the country's population (United States Census Bureau, 2022). This is a nearly 9% increase from the previous decade's data. It is an enormous increase from the census conducted in 1970, soon after the release of Baer and colleagues' (1968) seminal publication which put an emphasis on goal relevance for clients. The 1970 census reported that individuals of color represented only 12.6% of the total population (Singer, 2022). This is especially important given the mismatch between the racial makeup of the United States with the racial makeup of certified behavior analysts with only 21.5% of BCBA or BCBA-D certificants identifying as Black, Indigenous, or people of color (Syed et al., 2023). The national conversation is going through a long-overdue shift on listening to the preferences people of color who represent almost half of the country's population. In response to this cultural shift, other fields have start to prioritize cultural responsiveness training for early professionals (Jernigan et al., 2016). The field of behavior analysis is just beginning to accomplish the same training for professionals implementing the science.

**Current Recommendations**

*Start with Self*

The recommendation from numerous publications on building a culturally responsive repertoire is to begin by evaluating one's own cultural background and biases (Arango & Lustig, 2022; Dennison et al., 2019; Fong et al., 2016; Fong et al., 2017; Kirby et al., 2022; Lechago, 2022; Mathur & Rodriguez, 2021; Neely et al., 2020; Wright, 2019). The new ethics code calls for practitioners to carefully evaluate their own cultural awareness before beginning a professional relationship by identifying areas of strength and opportunities for growth (BACB, 2020). Practitioners can evaluate their own competence by reflecting on interactions with families, determining the appropriateness of those interactions, and making decisions about whether the relationship is a good cultural fit or if a colleague might better serve the client (BACB, 2020). This might be done by taking notes on an interaction with a family following an intake meeting that describe language used during the interaction, reactions observed, or comments made by the family. These notes could be reviewed before the next interaction and modifications made based upon the family's responses. A practitioner could review these notes with a mentor they rely on for developing a culturally responsive repertoire. Determining whether interactions are improving in terms of cultural responsiveness should be assessed by checking in with families and asking whether language used, family education strategies, and recommendations are in line with their preferences. This should be done frequently throughout a therapeutic relationship. Recognizing and acknowledging one's own biases can aid in a practitioner's understanding of how their own environment may affect their approach towards a clinical case. Reflecting on these biases can also help a practitioner see how their own circumstances differ from the circumstance of the family or client they are working with. Identifying biases could also include a practitioner covertly labeling any assumptions that are made before and after interactions with potential clients. For example, when first arriving to a family's home, the practitioner can ask themselves how the neighborhood the client lives in, the vehicle they see in the driveway, or even the report written by the diagnosing physician is influencing their assumptions about a family. Tacting these assumptions and recognizing them as biases might lead to differences in overt behaviors displayed during interactions with the family.

An evaluation of this type of bias might lead practitioners to create interventions that are more in line with a family's cultural identification. In a brief example, a clinician who grew up eating dinner in a dining room, at a table with at least one other family

member, with sparse back and forth conversation might assume that a family's goal of "eating a meal together" takes place in the family home in a similar manner. However, the family they are working with may have a full schedule and the ideal exemplar of eating a meal together for this family commonly resembles going to a busy restaurant, engaging in loud conversation, and laughing together at the end of the day. Mathur and Rodriguez (2021) warn that families might be hesitant to offer goals counter to the behavior analyst's recommendations because the behavior analyst is seen as the "expert" and the family would not want to risk losing clinical support. A self-examination of bias could help the clinician create a protocol that, from its beginning, takes family preferences into consideration. Fong and colleagues (2016) eloquently outline ideas on how professionals can embark upon this process. A sampling of these ideas includes discussing diverse client interactions with mentors or in small professional groups to gain feedback. Fong and colleagues remind us that self-reflection and talking about one's own behavior can help bring awareness to interactions that may have been inappropriate. Fong and colleagues also emphasize the importance of being an active listener and recommend that, "practitioners hone their ability to attend closely to clients and self, in context" (p. 86). Gatzunis et al. (2022) provided similar recommendations to those supervising mentees of diverse cultural backgrounds. Gatzunis and colleagues offer a comprehensive checklist that supervisors can use for self-evaluation. The checklist, called the Culturally Responsive Supervision Self-Assessment (CRSS) Tool, reminds supervisors to self-reflect on how individual biases may influence interactions. The tool combines the cultural background of the supervisor, the supervisee, and the clients being served to make a respectful interaction for all parties more likely. The ubiquitous recommendation of self-reflection supports the idea that to truly learn about how other cultures might impact programming, one must first understand how their own background creates bias.

*Creating Culturally Responsive Systems*

Several papers have emphasized the importance of beginning to teach cultural awareness at the inception of behavior analytic careers (e.g., Beaulieu et al., 2019; Fong et al., 2016; Fong et al., 2017; Mathur & Rodriguez, 2021; Najdowski et al., 2021). Training cultural responsiveness from the beginning of a behavior analyst's familiarity with the field would support simultaneously learning the importance of cultural identity and that behavioral principles are universally applicable. As an example, an early career behavior analyst learning about functional-assessment procedures while simultaneously being taught the importance of cultural considerations in assessment procedures (Dennison et al., 2019) would be better situated to choose an assessment the client is comfortable with. Initially teaching behavior principles through the lens of cultural humility could prepare practitioners to incorporate these considerations more readily into intervention decisions.

Mathur and Rodriguez (2021) provide specific components that could be involved in the implementation of a culturally responsive curriculum. The curriculum outlines competencies that are specific to client interactions such as creating treatment goals as a result of collaboration with a family. Also included are repertoires that reach beyond the impact that a clinician can have on a single family. Mathur and Rodriguez (2021) suggest behavior analysts engage in educational events specifically focused on the cultures within their community. Further, actions to help develop equitable supports for individuals with disabilities within their community are outlined as competencies. These actions include outreach to local pediatricians, collecting data on referral demographics, and actively advocating for those experiencing oppression (Mathur & Rodriguez, 2021). The curriculum created by Mathur and Rodriguez was inspired through a review of similar curricula from other disciplines. The medical field, for example, has begun the process of evaluating the results of a culturally responsive curriculum specific to training of medical residents (Jernigan et al., 2016). Although there remains no empirically evaluated training on cultural responsiveness for behavior analytic practitioners (Lechago, 2022), it is encouraging to see that thoughtful consideration of cirricula components is beginning.

*Cultural Considerations in Supervisory Relationships*

Once a behavior analyst enters the workforce, the responsibility of continuing to develop a culturally aware skill set lies with the individual, their supervisors, mentors, and the organizations that employs them. Additionally, it is the supervisor's responsibility to understand the differences between their own as well as their supervisee's cultural backgrounds. Gatzunis and colleagues (2022) outlined the importance of culturally responsive supervision and developed the previously mentioned tool that could be used during a supervisory relationship to evaluate whether the guidance of the mentor is sensitive to the background of both the supervisee as well as the individuals receiving services. The tool incorporates ongoing evaluation throughout the supervisory relationship to detect changes in bias and culturally responsive behaviors (Gatzunis et al., 2022). As with the first recommendation, this tool begins with the supervisor's self-evaluation of their own cultural background and how this evaluation could potentially affect services. The ethics code (BACB, 2020) also acknowledges the importance of cultural responsiveness in supervision

by outlining that supervisors evaluate their own scope of competence when supervising it is also required that supervisors incorporate topics related to diversity, equity, and inclusion into supervision experiences. Further, it is the supervisor's responsibility to ensure that their mentees are familiar with the current ethical code (BACB, 2020). This holds the supervisor responsible for contributing to the development of their mentees own cultural awareness (BACB, 2020; Gatzunis et al., 2022).

*Guidance for Protocol and Assessment Development*

Guidance has also been given to practitioners in developing specific interventions that incorporate the cultural preferences of clients. Several commentaries begin by suggesting an open conversation and listening to individuals and the communities who support them throughout services (Beaulieu & Jimenez-Gomez, 2022; Kirby et al., 2022; Lechago et al., 2022; Mathur & Rodriguez, 2021). Hayes and Toarmino (1995) describe the importance of understanding the functionality of behavior both from an individual as well as a community (i.e., cultural) perspective. Following information gathering, clinicians should ensure that the goals selected for intervention are aligned with the values of the client as well as their stakeholders and are appropriate given the client's context (e.g., workplace, community, family dynamic; Fawcett, 1991). A clinician's ability to collect this information will vary across the different skill sets of individuals being served. If a clinician is working with an individual with limited communication skills, specific assent procedures could be discussed with the family to ensure that client preferences are being prioritized during intervention. If a client or family disagrees with a clinician regarding the implementation of protocol that would be detrimental to the client's ultimate goal, practitioners should take the time to discuss these contingencies collaboratively. In an example, if a client is hesitant to begin an intervention to decrease facial skin picking in public settings but has an ultimate goal of going on a few successful dates, the clinician could discuss the interaction between the proposed goal and the ultimate goal to give the client more context regarding the clinician's recommendation. Beaulieu and colleagues (2022) reiterate the importance of considering the feasibility of the maintenance and generalization of skills within the client's natural environment. Determining whether the program would sustain should be a key factor in considering whether it should be started.

*Implementing Culturally Responsive Strategies at an Organizational Level*

Fong and Tanaka (2013) provide focused recommendations for how behavior analytic organizations can support the effort to increase the cultural responsiveness of the field. These standards include practices to support the diversification of the work force by mentoring and supporting candidates from diverse backgrounds. Recommendations for workplace activities such as ongoing training and clearly stated goals surrounding culturally responsive efforts were suggested. One recommendation Fong and Tanaka provide that has been echoed through clinical and research publications (e.g., Brodhead et al., 2014; Fong et al., 2016; Jimenez-Gomez & Beaulieu, 2022) is that demographic data surrounding the cultural and ethnic makeup of the individuals an organization serves are imperative to capture. Organizations should be thoughtful regarding the allocation of time and funds towards these initiatives, given their importance and the amount of time and effort that will go into creating systems-wide changes. Fong and Tanaka's suggestion of creating and adhering to organization-wide goals surrounding diversification and cultural education can help ensure that the time taken in the process of developing these strategies is not placed solely on the individual clinician. Fong and Tanaka's recommendation to, "ensure that staff at all levels and across all disciplines receive ongoing education and training in culturally and linguistically appropriate service delivery" (p. 18) would mean a giant organizational shift for those who do not already have similar systems in place. However, organizations can follow Goldiamond's (1974) advice, once again, and start with the current organizational repertoire to build towards an overall goal in incremental, meaningful steps. This could mean that an organization begins by adding culture-specific content/trainings to already scheduled meetings. After feedback is collected, the organizations could plan for future meeting time to increase the training opportunities for their staff. Providing staff with resources and support in this effort should be considered part of an organization's long-term continuing education commitment.

**A Call for Empirical Investigation**

*Getting Started*

A decade has now passed since Fong and Tanaka's (2013) call for building stronger cultural alliances through behavior analytic services. An empirical question that remains to be determined is how these recommendations are impacting the repertoire of today's behavior analysts and the clients they serve. Research in this area will be difficult as the process of identifying and measuring relevant behavior change associated with the development of a culturally responsive repertoire can be a difficult undertaking (Mathur & Rodriguez, 2021). Is it possible to measure and capture the shifts in a bias? How can we ensure that the actions taken by practitioners are seen from the family's perspectives as genuine, rather than just a box to be checked (Rohrer et al., 2021)? We might start with evaluating the suggestions provided in

the articles mentioned throughout this paper and determining those that make the strongest impact.

We can also examine the example of another current issue within behavior analysis that is interdependent to cultural humility, that of compassionate care (Lechago et al., 2022; Rohrer et al., 2021). Rohrer et al. (2021) summarized the status of the field of behavior analysis as it relates to compassionate care and suggested a checklist, called the Compassion and Collaboration Tool, that could be used in guiding practitioner behavior in this area. The Compassion and Collaboration Tool was informed by publications that taught compassionate care skills to those within health care and other human services fields. The checklist's publication was followed by Rohrer and Weiss (2022) who evaluated whether these skills could be taught to pre-certification masters students. The researchers delivered behavioral skills training to teach different skill sets outlined by the Compassion and Collaboration Tool. These skill sets included basic skills (e.g., nodding while listening, providing a positive introduction at the beginning of the interaction), showing interest in the family (e.g., asking about preferences, incorporating the caregiver's feedback into the intervention), and joining in with the family (e.g., providing empathy statements and statements that demonstrate the practitioner will join in the family on therapeutic efforts; Rohrer & Weiss, 2022). Rohrer and Weiss had only four participants, but the results showed excellent progress within a multiple baseline design across skill sets. This study set the stage for continued research within this and similar areas. The same type of work has just recently begun around cultural responsiveness, providing hope to potentially inspire researchers and encourage this line of work to gain momentum (Neely et al., 2020).

Neely and colleagues (2020) conducted one of the first assessments of a culturally responsive curriculum implemented by educators in a classroom setting. The curriculum described observable actions a teacher could make to support a classroom's inclusion of cultural differences. These components included environmental details such as displaying classroom rules in the primary languages of the students and using diverse representations of authors and individuals included in pictorial prompts. Additionally, teacher responses to students were evaluated as well as whether these responses were in the student's primary language. A multiple-probe design evaluated the effects of training on the specific components of the curriculum. All teachers increased the percentage of curriculum components implemented in their classrooms following the training and satisfaction with curriculum implementation was generally high. Neely and colleagues' study serves as a good starting point for researchers to begin empirical evaluations using similar methods. Continued conversations and updated research methodology regarding culture will always be needed as cultures continually shift (Lechago, 2022). Commentaries and advice from experts in this domain should keep coming, but as it is generated, researchers should purposefully evaluate recommendations to guide and improve future efforts.

*Operationalizing and Measuring Success*

Specific behavior change would be the goal of the aforementioned research, but how can it be determined that the time committed to this effort has made a difference? The ultimate indicator should be intervention sustainability. Families often have a variety of obligations within their daily lives and practitioners should make sure that an intervention is worth the response effort committed. If a family sees the value in the results of an intervention, it is aligned with their values, and able to be implemented with the resources they have available, the intervention is more likely to be sustained. Additionally, evaluation should frequently be conducted as to the acceptability of the procedures. Alai-Rosales et al. (2022) suggest that clinicians frequently ask themselves, "Do the people the clinician is working with feel happy about the progress that was made? Are the families involved and did they participate throughout the process?" (p. 161). These questions asked throughout the duration of intervention can help guide the practitioner as to when reevaluation and adjustments are needed.

To ensure that clinician and organization success in cultural responsiveness is not siloed to one demographic, several publications recommend categorizing social validity data collected according to the demographic data of clients (e.g., Beaulieu et al., 2019; Dennison et al., 2019; Lechago, 2022). Doing so would allow for satisfaction to be evaluated across client cultural identities to identify areas in which additional training may be needed. Data could also be collected on referrals from other providers or families. This data may be helpful in determining if families or providers of certain cultural backgrounds are recommending an organization's services to others more or less often. An additional suggestion when conducting social validity surveys is to ensure that the questions asked are those that will inform clinicians with respect to cultural responsiveness. For example, asking questions such as, "Does this program reflect a goal that you and your family prioritizes?" or "Do you feel comfortable implementing all aspects of this program?" would be more beneficial in the evaluation of cultural responsiveness when compared to, "Are you satisfied with the level of behavior decrease/increase?" These surveys should also be prioritized for translation to the family's primary language. Families should be given opportunities within these surveys to anonymously reflect upon the clinician's demonstration of respect for their preferences and culture. As previously mentioned, specific behavior change to support cultural responsiveness is a good

start, but not the end goal. The goal of all services should be to make a socially valid change. Families who feel a practitioner has taken the time to understand their preferences and values are more likely to continue with implementation of recommendations (Beach et al., 2006). Services that incorporate culturally responsive practices give the best chance for family satisfaction and sustained behavior change (Jimenez-Gomez & Beaulieu, 2022).

**Guidance for Practitioners**

The articles mentioned throughout this paper offer a variety of methods that could be used as guidance in developing a culturally responsive repertoire. When combining ideas from the foundation of the field of behavior analysis with the current theme of cultural consideration, five themes emerge that practitioners should consider as they embark on the process.

*Be a Behaviorist*

The first recommendation is that the guidance from a behavior analyst must follow the principles of the science. Above all, it the duty of practitioners to adhere to the principles of behavior analysis and to be effective (Baer et al., 1968; Dennison et al., 2019; Kirby et al., 2022). This does not mean that benign non-behavior analytic recommendations are not tolerated, but that the practitioner is a behavior scientist with respect to their careful evaluation (Bowman et al., 2021; Newhouse-Oisten et al., 2017). Pseudoscientific methods are commonly found among suggested interventions designed to support individuals diagnosed with autism spectrum disorder (Normand, 2008; Travers et al., 2016). Normand (2008) describes the importance of being skeptical in the evaluations of interventions suggested or preferred by a family. Skepticism, in this sense, means carefully considering the research supporting suggested interventions and evaluating those interventions in a systematic way (Normand, 2008). Travers and colleagues (2016) describe skepticism as, "a repertoire of behavior that is developed gradually and in lockstep with scientific literacy" (p. 268). Behavior analysts should listen to the preferences and suggestions of families from varying cultures, but also be skeptical in their acceptance and application of these recommendations.

There are several publications that offer guidance in evaluating non-behavioral treatment preferences expressed by families. Bowman and colleagues (2021) provide standards for transdisciplinary collaboration that include actions such acknowledging and avoiding pseudoscientific suggestions. Newhouse-Oisten et al. (2017) guides practitioners through an ethical decision-making matrix that evaluates the use of evidence-based and non-evidence-based treatments. Brodhead and colleagues (2015) highlight the importance of translating recommendations from parents and colleagues to the behavioral principles that might make up the intervention. A translation to behavioral principles can allow the behavior analyst to better understand the variables that could affect behavior. Using this approach provides a behavioral lens for evaluating recommendations suggested by families and others. This is the lens through which all additional recommendations should filter.

*Be Flexible*

Thanks to almost decades of research, there are a multitude of options for the selection of procedures that utilize behavior analytic principles. Sticking to only a prescribed way to conduct a specific intervention is not a practice that reflects cultural responsiveness. Families will rarely be familiar with the behavior analytic literature, and their confidence in the field's effectiveness will likely not be as strong as their practitioners' (Rosenberg & Schwartz, 2019). Competent professionals should also be comfortable in evaluating the work of another discipline through a behavioral lens as previously mentioned. This is, no doubt, a skill set that will need to be honed. The translation and evaluation of procedures that may not be well established within the behavioral literature could go a long way in demonstrating to a family that their recommendations are taken seriously (Brodhead et al., 2015; Jimenez-Gomez & Beaulieu, 2022). Bowman and colleagues (2021) provide general guidance in this area and outline that overall, treatments to be implemented, "do not put the client in any danger and will not cause harm", "are empirically supported,", and "are effective" (p. 1201). Developing a repertoire for evaluating and translating the research of other disciplines could help increase the flexibility of practitioners in collaborative intervention efforts with families.

The suggestion of flexibility might seem antithesis to what the research supports. After all, some of the most well-regarded behavior analytic publications are those that suggest specific decision-making models that guide practitioners to select interventions given specific contexts (Geiger et al., 2010). This does not mean that these tools are obsolete when working with families with different cultural backgrounds. Rather, when using them, practitioners should overlay a family's values and preferences onto the decision making matrices. Preferably, a practitioner could conduct this decision-making process with the family to make a collaborative decision regarding protocol implementation (Geiger et al., 2010). This will help ensure the intervention not only reflects the clinician's observations and recommendations but also those variables that are important in sustaining the intervention in the client's natural environment.

*Be Humble*

In the effort of increasing cultural awareness, mistakes will be made and each of them is a learning opportunity. Neuringer (1991) gave the first guidance to the field of behavior analysis in the importance of professional humility. Neuringer reminds the field that behavior analysts should be comfortable admitting and correcting mistakes. A humble behaviorist is one that admits ignorance, and this should be applied within the context of cultural humility as well (Neuringer, 1991). Practitioners that adopt a position of humility will help to advance the field and can aid in the dissemination of the science to more diverse communities (Kirby et al., 2022). When working with a family who offers a suggestion a practitioner is unfamiliar with, they should admit the limitation in knowledge (Kirby et al., 2022). An appropriate response to the family might be "I'm not well-versed in that. Let me do some research and get back to you."

Taking a truly scientific stance embraces the concept that knowledge is provisional, which is also the case with cultural knowledge (Neurenger, 1991). As Lechago (2022) describes, "culturally responsive behaviors must be trained such that they are sensitive to the constantly changing contingencies and interactions within and across the multiple consumers that we serve" (p. 15). A culture that a practitioner thought they were familiar with might present differently across different families, leading an action to cause offense. This means that the ultimate goal is not to fully understand a culture, but to be good at graciously admitting mistakes when they occur and acting to correct them.

*Be Brave*

Conversations surrounding cultural preferences might initially be awkward for a clinician as they first start to develop their own repertoires. It is important that the clinician weighs the importance of these conversations with the temporary discomfort of having them. Dennison and colleagues (2019) make a wonderful suggestion to take time and talk about past experiences and hardships that the family has faced as intervention begins. If this type of conversation seems awkward or disingenuous at first, role play with a colleague and solicit feedback on questions or comments that came across inappropriately. Above all, behavior cannot be shaped if it is not emitted. Clinicians cannot learn from mistakes that they were too worried to make. It may be helpful to solicit the support of a supervisor or colleague when these types of conversation are upcoming and to let them know the conversation is happening. This would allow the supervisor to hold the practitioner accountable for having the conversation and reporting back regarding how it went. When beginning these conversations, take the advice of Alai-Rosales et al. (2022) and "do the best you can with great care" (p. 159).

*Commit Time to the Effort*

Many have suggested making efforts to understand the diverse cultural backgrounds of families that will be receiving services (e.g., Arango and Lustig, 2022; BACB, 2020; Dennison et al., 2019; Fong et al., 2016), which has now been formally incorporated in the updated ethics code (BACB, 2020). This type of activity might not come naturally as our environments generally support the perpetuation of the cultures of which we are a member (Miller et al., 2019). Machalicek et al. (2021) describes the importance of putting in time and completing measurable activities to begin engaging with different cultures. This could seem like a daunting task for practitioners with full caseloads and little personal time, but Machalicek et al. give recommendations for small tasks that can be built upon to make meaningful changes. Incorporating culturally relevant topics into supervision meetings, listening to podcasts, reading books by authors of a culture that differs from one's own, or following social media accounts that focus on issues in diversity are just a few suggestions that could be incorporated into a practitioner's busy schedule (Machalicek et al., 2021). To say that the lives of practitioners are busy is an understatement. The idea of finding time for this type of activity might seem difficult, but it is necessary. Additionally, organizations that employ behavior analysts should take time to prioritize this type of training and self-reflection. Trainings could be offered that educate interventionists and supervisors regarding the unique cultural landscape of a community where a clinic is located. A standing agenda item in supervision meetings could be to discuss the biases that a clinician identified during sessions that week. Larger companies could identify experts or members of specific cultures who are available to review protocol development. Time during parent training activities could be dedicated to talking with families about family background, previous therapy experiences, or how they have used the procedures that week. These are just a few ideas that might help practitioners incorporate the development of this repertoire within already existing professional activities.

## Conclusion

Those who practice behavior analysis compromise culture that is uniquely its own (Glenn, 1993). Just as an alumni group, members of the same church, or members of a specific community would conduct themselves when around their own members, so too do behavior analysts. Different cultures are not always siloed and must work together towards common goals. In this way, the culture of behavior analysis interacts with the cultures of the clients that they serve. It is the behaviorist's responsibility, not the families, to make changes to allow for behavior analysis to fit into each

family's culture. It is understood that the best way to establish lasting change is to build from an already existing repertoire, and a family's culture is the place to start and learn from (Goldiamond, 1974).

For a young field, behavior analysis has come far but also has much more work ahead of it. Many of the research ideas presented previously are already in progress by colleagues, meaning that the empirical support for culturally responsive recommendations is well on its way. Vargas (2022), summarizing Skinner, suggests that "a culture increases its survival when it is sensitive to collateral and deferred effects" (p. 8). The satisfaction of those who experience intervention are the field's collateral effects. It is the incorporation of the cultural preferences of others that will help bolster the acceptance of applied behavior analysis and solidify its survival.

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# The Contingencies Associated with Certification and Licensure

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## Abstract

The science of behavior began in the laboratory setting, focusing on the direct measurement of behavior-environment relations. The field of applied behavior analysis (ABA) is relatively new with the first publications in the flagship journal, The Journal of Applied Behavior Analysis, appearing in 1968. Soon the application of the science was applied to the treatment of autism and, due to its tremendous success, the number of professionals claiming to use behavioral procedures increased exponentially. It became obvious that some sort of systemic oversight needed to be created to protect both consumers and practitioners, and difficult questions had to be raised concerning licensure, certification, which was more advantageous to pursue, and with what consequences. The purpose of this paper is to explore the historical roots of behavior analysis and provide commentary and context to the movement of certification up to the current day. Current challenges within the field of ABA will also be reviewed, along with recommendations to ensure that ABA-based intervention in the future is high in quality.

**Keywords:**

Licensing, Certification, Autism, Behavior Analyst

## Introduction

In 1987, Lovaas published a groundbreaking study, documenting unprecedented outcomes with children with autism receiving intensive behavioral intervention services. Roughly half of the children were labeled as indistinguishable from peers after two-plus years of intensive (i.e., 40 hr or more per week) intervention (Lovaass, 1987). In 1993, Catherine Maurice published a book outlining her two children's journeys through autism, which illustrated the remarkable outcomes that had been demonstrated in the Lovaas study. The book highlighted the contribution of a treatment, referred to as applied behavior analysis (ABA), which had contributed to their progress and remarkable outcomes. ABA is a branch of behavioral science that focuses on socially significant behavior; while it has been known best for autism intervention, it is the grounding in science that defines the field. Suddenly, parents of newly diagnosed children searched for ABA-based interventions (Maurice, et al., 2001). Soon, waiting lists were long, providers were overwhelmed, and a clear supply-demand issue arose (Roane et al., 2016).

This unfilled demand created an opportunity for practitioners within the field of ABA and showcased the potential of behavior analytic services for children diagnosed with autism. At the same time, this opportunity created a vulnerability for the field's reputation. In the absence of any identified criteria for competence, many uncredentialed practitioners claimed to be able to provide ABA-based services, leading to problematic varied quality of treatment (e.g., Stolz et al., 1975). Parents and school districts alike employed practitioners to guide ABA programs, many of whom did not have adequate professional training to treat the wide range of the population of individuals with autism (Bailey & Burch, 2022). This 'wild west' of clinical intervention had the unfortunate consequences of children being under served by a lack of sensitivity to the concerns of parents, families, and the child themself, goals not being met, and procedures being used without necessary buy-in. It became clear that standards needed to be identified for professional competence in behavior analysis.

The movement for certification began in Florida in the early 1980s (for more historical details see Bailey & Burch, 2006; Dorsey et al., 2009). The early motivation for certification stemmed from the abuses that had occurred in the name of behavior modification, particularly at state hospitals (Goldiamond, 1975). The documentation of such treatment at Southland and Willowbrook, for example, offer a revealing glimpse into this dark past of behavior analysis. Eventually, certification moved to the national level and clarified the skill set associated with professionals in behavior analysis. With this clarification, parents and employers could identify individuals with at least the minimal requisite skill set to meet the needs of individuals with autism. Some earlier discussions of licensure had expressed ambivalence in the field, with some highlighting possibilities and others urging more merging with other fields (Agras, 1973; Alessi, 1979). Certification was the first step toward standardizing the expertise required to professionally practice as a behavior analyst, and was designed to protect consumers from inhumane care and ineffective treatment (Starin et al., 1993).

The purpose of this paper is to review the rise of certification, the changes in certification that have transpired, and the practice challenges that face practitioners today. Some current challenges include the interest of businesses in ABA-based intervention which is leading to changes in business models applied within service intervention. Suggestions for blending clinical expertise and business acumen to ensure high quality, sustainable intervention will be discussed.

*Movement for Licensure and Mixed Opinions*

Discussions ensued about whether certification's strength could be augmented with state licensure (e.g., Bailey, 1991; Green & Johnston, 2009a). Some argue that such licensure would lead to additional benefits, including insurance reimbursements and further oversight of the individual practitioners. Furthermore, licensure would not only expand the number of autistic individuals who would have access to ABA-based services, transforming the landscape of autism intervention (Hassert et al., 2008), but also provide protections to the consumers in the form of disciplinary procedures that would deliberately enhance gatekeeping and quality control (Dorsey et al., 2009). Dorsey et al. (2009) highlighted several additional strengths of licensure, including defining a scope of practice and distinguishing the field as separate from psychology.

Green and Johnston (2009a) highlighted several areas of risks as well as benefits to professional licensure. Benefits included legal protection of a right to practice and third-party reimbursement (e.g., insurance funded services; Green & Johnston, 2009b). However, licensure was impacted by individual state laws (Green & Johnston, 2009b). Risks included limiting the types of activities a practitioner may engage in under their license and overlap with other professions (e.g., psychology and social work, which may create competition to limit scope of practice particularly when other professions claim to utilize ABA in their practice). In addition, the public process of professional licensure had an inherent risk of alerting other fields who use behavior analytic principles in their practice (Green & Johnston, 2009b). For example, such fields, including psychology, might advocate for behavior analysts to receive supervision under their discipline rather than within its own clinical framework. Given these considerations, and the then-current status of licensure of applied behavior analysts, the field was divided about how to ensure that the sustained movement continued (Dorsey et al., 2009; Green et al., 2009a; Green et al., 2009b). Although there were some advocates of licensure, there were also advocates of certification who did not think licensure was the best path. Indeed, the landscape was difficult to predict, and differential outcomes across states did play out (Dorsey et al., 2009).

In 2014, the Association of Professional Behavior Analysts (APBA) published a position statement on government regulation of practice as well as on potential benefits, risks, and recommendations. It indicated that government regulation for professional licensure in the United States commonly included the development of statutes, typically adopted and developed at the state level, and regulated in an ongoing way by state agencies (APBA, 2014). "Statues and regulations

may mandate that ABA services be provided only by individuals who hold a government-issued credential" (APBA, 2014, p. 1). Additionally, government regulation may protect ABA practitioners' right to practice from intrusion by other professions, help ABA practitioners qualify for third-party payments for services (but national or international certification may suffice) and other types of laws and regulations typically govern third-party payments, afford ABA practitioners parity with other professions, and provide for enforcement of standards of professional practice by government regulatory bodies (e.g., licensing boards) to protect consumers (APBA, 2014).

> *Several risks of pursuing government regulation were also highlighted.*
>
> *Obtaining a statute to regulate professional practice is a complex, resource-intensive political process. Ideally, the legislative effort should be led by an autonomous local (e.g., state or provincial) behavior analysis organization supported by a national or international organization that has public policy experience. Even then, the legislative process may yield unsatisfactory outcomes, and may leave ABA practitioners worse off than before. Other interest groups may oppose policy initiatives by behavior analysis and create statutes and regulations that impose undesirable restrictions on the practice of ABA. Government regulatory boards may not include people who are trained in ABA. Fees may be relatively high Statutes and the regulations or rules to implement them will vary across jurisdictions, which may limit portability of government issued credential (APBA, 2014, p. 2)*

Given the complexity of the regulatory process, which includes considerations of local regulation including the creation and composition of licensing boards and the funding of such initiatives, APBA's (2014) position statement cautioned the field on a variety of issues. APBA (2014; 2020) recommended consideration of several factors regarding government regulation. Specifically, they identified several key potential vulnerabilities (APBA, 2014; 2020). First, they noted that licensure is a resource-intensive political process. This necessitates the mobilization of a professional guild with public policy experience. Second, they noted that others may oppose the initiatives, and may lobby to restrict the practice of behavior analysts. This actually did occur in several states. For example, in North Carolina, behavior analysts were made to operate under the supervision of licensed psychologists. In New York, behavior analysts were restricted to working with the population of individuals with autism only. Additional risks included that boards may not include those who are trained in ABA, licensing fees may be high, and the recognition of the credential across states could be limited, making it difficult for practitioners to move or be recognized in different locations.

As such, local jurisdictions were encouraged to consider whether regulation was feasible. Additionally, local jurisdictions were encouraged to ensure that Board Certified Behavior Analyst (BCBA®) certification was the foundational requirement of licensure and that behavior analysts were included in the regulation of ABA practice (APBA, 2014). In addition, while behavior analysis was a relatively "young" field (compared to allied, well-established fields such as psychology and education), local groups were encouraged to continue their efforts to maintain and build high level standards (APBA, 2014).

### *An Analogous Process in Psychology*

Licensure was new to the field of behavior analysis. The field had to act quickly to learn about credentialing, licensure, insurance reimbursement, and the business aspects of these changes to service delivery models (Green & Johnston, 2009a). With 50 states facing this issue, and international applicants for certification, it became difficult to envision a message that would universally apply to different regions. Allied fields had more history and expertise in this area, and there were lessons to be learned in their processes (Kaslaw et al., 2004).

First and foremost, establishment of a credential requires defining and outlining competence of the practitioner. The National Council of Schools and Programs of Professional Psychology (NCSPP), incorporated in 1985, outlined the core competencies for training and practice in psychology (see Table 1). Additionally, psychology has developed a system of foundational as well as functional competencies (Kaslaw et al., 2004). To develop agreement throughout various domains of professional psychology and to develop tools moving beyond curriculum to a competency-based approach, representatives from several areas including education, practice, research, and public interest, were selected to participate in a Competencies Conference, held in Scottsdale Arizona, in November of 2002 (Kaslaw et al., 2004). The goal of the conference was to identify and make recommendations for the identification, training, and assessment of competencies in the field of psychology. A major shift away from core curriculum and toward identification of core competencies was recommended (Kaslaw et al., 2004). In psychology, training methods used are specified to meet levels of competence as well as to generalize competence across domains (Kaslaw et al., 2004). Although the specific training methods and areas of specific competence were not described by the committee, it was suggested that future efforts should be directed at determining the specific areas in which to build and measure skills (Kaslaw et al., 2004).

Similar concerns and processes related to the evolution in behavioral science. The addition of functional competencies provides not only an educational but a practical requirement for the practice. Foundational competencies for those credentialed by the Behavior

**Table 1**
The National Council of Schools and Programs of Professional Psychology Core Competencies in Graduate Training

| Number | Competency |
|---|---|
| 1 | Develop standards for the education and training of professional psychologists. |
| 2 | Monitoring and providing input into public policy with regard to education and training of professional psychologists. |
| 3 | Providing a forum for the exchange of information about the functioning of schools and programs of professional psychology. |
| 4 | Providing a liaison with others involved in the education and training of professional psychologists. |
| 5 | Providing consolation of the development and maintenance of schools and programs of professional psychology. |
| 6 | Fostering research, development and application in appropriate areas of psychology and to the solution of significant problems of human welfare. |
| 7 | Developing quality assurance methods based on an empirical evaluation. |
| 8 | Gather and disseminate information regarding schools and programs of professional psychology. |

Analysis Certification Board (BACB) such as Registered Behavior Technicians (RBT®s), Board Certified Assistant Behavior Analysts (BCaBA®s), and BCBA®s must meet criteria based on Task List items (BACB, 2022). Task List items are frequently reviewed and altered, based upon priorities discussed within the field. The 6th edition of the Task List has been released, and the areas outlined include:

A. Behaviorism and Philosophical Foundations

B. Concepts and Principles

C. Measurement, Data Display, and Interpretation

D. Experimental Design

E. Ethical and Professional Issues

F. Behavior Assessment

G. Behavior-Change Procedures

H. Selecting and Implementing Interventions 20

I. Personnel Supervision and Management

As can be seen in this list, Task list items include competencies that are foundational as well as those that require the application of the principles of ABA. This practical requirement for BCBA® certification includes fieldwork supervision by an approved, trained BCBA® supervisor. Clinical supervision must meet certain requirements as outlined by the BACB. Additionally, some state licensure boards also include supervision by a BCBA®, especially for certain tiers of the profession or for those who are relatively newly credentialed.

Additional requirements are needed for certification at other ranks of the profession. The BCaBA® credential also requires both coursework and supervised fieldwork in order to obtain the credential. In addition, BCaBA®s must be supervised by BCBA®s in their clinical work. RBT® certification requires competency assessment for initial certification and requires ongoing supervision at the level of 5% of hours worked. These guidelines are designed to ensure quality control in both the certification and the ongoing service provision of the RBT®.

*BACB Changes and Alternative Credentials*

Over time, the BACB became internationally relevant. The BACB was established in 1998 and first began credentialing outside of the United States in 2001 (BACB, 2019). In 2002, the BACB began implementing several initiatives for international expansion, including course sequence approvals, translating exams, adding international members to the Board of Directors as well as in subject matter working groups, and providing financial support to assess degree requirements for international certification applicants (BACB, 2019). However, it became increasingly difficult to ensure equal access worldwide. Issues were noted in the ability to serve an international community and to provide appropriate levels of guidance in geographically diverse regions (BACB, 2019). In 2019, the BACB indicated the need for a change to international certification, citing several areas impacting the viability of maintaining a global credential. Several areas considered included ensuring secure testing facilities, compliance with varying privacy laws, ensuring eligibility and maintenance as well as ethics requirements are legally enforced, and enforceable regulatory authority in each country (BACB, 2019).

Ultimately, the BACB stepped back from credentialing individuals except in North America (BACB, 2019). As previously noted, issues in equal access to materials was an issue, given the diversity of worldwide certificants. In addition, regional issues created a need for different models for training and for credentialing. It became clear that individual countries or regions were in the best position to advocate for, design, and implement the credentialing systems in their parts of the world. While this was understandable in terms of global considerations, it also created some confusion about how competence can be identified in the absence of the BACB credentials.

While the BACB's decision to end credentialing individuals except in North America created some uncertainty for the internal behavior analytic community (Keenan et al., 2022), it also created opportunities for countries and regions to consider the development of national or regional credentials that better reflected their systems and cultures. For example, higher education systems vary by country, and some requirements did not easily align with pre-existing structures within their educational systems. The paucity of available, local supervisors also created logistical challenges to meeting the requirements outlined by the BACB. Despite stepping back from the international credential, the BACB demonstrated commitment to supporting the global community with its mission "to protect consumers of behavior analysis services worldwide by systematically establishing, promoting, and disseminating professional standards (BACB, 2019, p.3). In the wake of these changes, a variety of alternative certifications arose. For example, the Qualified Applied Behavior Analysis Credentialing Board (QABA; https://qababoard.com/about/) credentials focused on the application of the science of ABA with individuals with autism and marketed itself as internationally accredited. The International Behavior Analyst Association (https://theibao.com/) credentials specifically targeted the international behavior analytic community serving individuals with autism. These alternate certifications have created some genuine confusion on the part of practitioners, as well as on the part of third parties.

*Evaluating Credentialing Bodies*

The Association of Professional Behavior Analysts (APBA), in response to requests for information on the various types of credentials within behavior analysis, has established a set of guidelines for evaluation of such credentials (Green, 2015). The guidelines include a series of questions to ask regarding credentialing programs. The evaluation includes a series of questions in two key areas: 1) the credentialing body and 2) the credentialing program(s). Some key features to consider in the credentialing body included: time in existence, who makes decisions for the organization, evaluation of the organization by standards for nonprofit organizations, and evaluation of the senior leadership's training in behavior analysis. Key features highlighted for assessing the credentialing program included ensuring the accreditation by the National Commission for Certifying Agencies (NCCA) or the American National Standards Institute (ANSI), assessment of job analysis studies, incorporation of a comprehensive outline of competencies, a comprehensive, well-designed exam, continuing education requirements, and the incorporation of ethical and disciplinary standards (APBA, 2018; Green, 2015).

It should be noted that using time in existence as a key indicator of quality is dangerous; presumably, all credentials begin as new, and changing times may necessitate the development of targeted credentials. While the international market has been a catalyst for some of the newer credentials for the autism sector, concerns about quality ABA have also sparked new credentials. The Progressive Behavior Analyst Autism Council (https://progressivebehavioranalyst.org/) is designed to ensure high level training of autism interventionists. Their Certified Progressive Behavior Analyst - Autism Professional certification denotes a high level of content knowledge and expertise in the application of ABA to autism, and the pending Interventionist and Supervisor credentials will extend the certification to those who implement and oversee intervention.

*What Has Been Achieved?*

One of the major accomplishments of certification in behavior analysis was the identification of critical skills for practicing behavior analysis (Moore & Shook, 2001). Until the development of professional certifications, there were no standards by which consumers could judge competency (Baily, 1991). Certification resulted in the development of lists of knowledge, skills, and competencies that then served as a guide for professional competency (Johnston & Shook, 1993). Certification began the process of empowering consumers to identify providers that have met a set of established competencies and served as a gateway for licensure. When first introduced in the United States, licensure laws were focused on insurance reimbursement eligibility (Unumb, 2015). This had a tremendous impact on families of children with autism, who were able to get vital treatment covered through medical insurance. It created a seismic shift in the industry, greatly increasing demand and forcing new models of service delivery. It was unquestionably this insurance reimbursement entitlement that created a multi-tiered model of service delivery, with RBT®s providing direct instruction under the supervision of other tiers of the profession, notably BCaBA®s and BCBA®s (Council of Autism Service Providers, 2014, 2020).

*What Are Other Unintended Consequences?*

Perhaps the largest unanticipated consequence of licensure and insurance reimbursement has been the monetization of the field (Fry, 2022; Jennings, 2022; Perna, 2022). Business professionals have realized that they can make a profit doing ABA-based therapy with insurance reimbursement (Fry, 2022), with interest in acquiring ABA businesses growing, and many service providers selling their businesses to larger conglomerates and to big equity firms (Matthew, 2022). Major shifts in service delivery have resulted from financial and logistical barriers. Specifically, in several instances, providers have opted to simply discontinue service in certain states. This can leave clients without services, in danger of skill loss, and can leave families clamoring for services. Short of this, some companies increase caseloads for behavior analysts and/or reduce supervision for RBT®s. They may also restrict activities that cannot be billed to insurance companies, which include vital services such as parent training. Some highly publicized examples of these decisions have shed light on some of the unanticipated negative outcomes associated with business's interest in ABA.

Naturally, this is a circumstance with both potential positive and potential negative impacts. On the positive side, the influx of business expertise may be helpful; indeed, some say that the expertise of business professionals is sorely needed. As the field has rapidly expanded, and as more documentation is expected by funders, business practice updates are sorely needed. There is a deep need for the expertise of business professionals in examining expenditures, in streamlining processes and evaluating room for improved efficiency. These are skills that are generally not emphasized in the training of practitioners of behavior analysis, and there is room for improvement in the business aspects of ABA intervention.

At the same time, there is a need to commit to the maintenance of high-quality intervention. When adjustments are made for efficiency purposes that reduce quality of care, an ethical dilemma arises for practitioners. This creates inherent tension between the clinicians and the business partners. Clinicians have been trained to act in the best interests of clients, to provide best practice interventions, to train staff to mastery, and to closely supervise staff in an ongoing manner to ensure high fidelity and effective intervention. These values are deeply embedded. They are also expensive.

A business professional is concerned about quality, of course, but is also charged with ensuring the health of the business. Hence, they examine trends in spending, in waste, and inefficiency. They suggest alternatives to streamline such processes. It may be that there is a suggestion for reduced supervision, for truncated training, or for the expansion of caseloads. A behavior analyst hearing these suggestions will focus on their obligations to clients, primarily, and to trainees, secondarily. The impact on services to the individual will be examined, and potential negative impact will be flagged as problematic. In the same way, inadequate training and supervision will be flagged as potentially leading to ineffective intervention and to poorer outcomes for the client.

On a broader level, the business partners may assess a context as unsalvageable, and may pull services from a region. This has been reported by several companies in multiple regions recently (e.g., Matthew, 2022). This is considered highly unethical by clinicians, who see this as abandonment of clients.

How can we build bridges between the clinicians and the business partners in these scenarios? This is the part of the story that is not yet written, as it is a current and ongoing developing story. It remains to be seen how behavior analysts and business professionals can partner to deliver behavior analytic services. Issues of effectiveness, quality control, efficiency, shared governance, and training abound. Such a partnership could work under certain conditions that have yet to be identified.

Challenges include identifying how to ensure quality intervention, balancing the need for efficiency with the commitment to quality, and ensuring that training programs prepare practitioners for the real-world challenges in today's ABA practice context. Many hopeful signs have been noted. A number of organizations are certifying (or plan to be certifying) organizations, including the Behavioral Health Centers of Excellence (BHCOE; https://www.bhcoe.org/) and the newly formed Autism Commission on Quality (ACQ; https://autismcommission.org/), offer standards for quality care and a mechanism for identifying providers who meet them. In this new era, it is important for behavior analysts to partner with business professionals to find ethical and effective ways to efficiently deliver services. A heightened interest in efficient business models may help behavior analysts contribute to the solutions; increasingly, knowledge of the organizational behavior management arm of the science of ABA is crucial for behavior analysts to possess. There are indications that both practitioners and students of ABA are being increasingly supported in learning about the practice challenges facing providers of ABA. All of the professional organizations associated with ABA now highlight practice issues substantially in conference offerings. It will also be important for universities to include practice challenges in their course content; they are especially relevant in courses such as ethical conduct and supervision, both of which are required for certification by the BACB.

It may also be necessary to identify models of shared governance and decision making within organizations devoted to serving the autism community. Some of the present-day challenges seem to stem from the loss of the clinical perspective in leadership and management. The complex needs of individuals with autism require highly specialized expertise; models of service delivery must be vetted by those who best know the needs of this population. It will be vital to create some shared governance models (in which behavior analysts and business professionals jointly manage organizations), and to assess how well these models do in providing quality care.

**Conclusion**

Ultimately, the priority of the behavior analyst should always be the best interests of the individual served. This has been a foundational value (Bailey, 1991), is embedded into the Ethics Code (2020), and should always be the purpose of any intervention. Certification advanced this priority by outlining key competencies essential for professional behavior analysts (BACB, 2022). Certification created a road map that inspired training programs (Pastrana et al., 2018), supervision requirements (LeBlanc et al., 2016), and standards of practice (BACB, 2020). Certification professionalized behavior analysis. It also highlighted behavior analysis as a professional guild. Behavior analysts were seen as vital members of interdisciplinary teams (Brohead, 2015). Importantly, certification also linked behavior analysis with autism service provision (Zhang & Cummings, 2020), since much of the increased demand was for individuals who could serve individuals with autism.

Licensure expanded the extent to which behavior analysis became a business. Business became interested in the profits available in behavior analysis, and began buying small companies at a high rate. The consequences of insurance reimbursement were far-reaching, and included the expansion of services, an increase in training programs, and an increase in the purchasing of ABA organizations (Matthew, 2022).

Much of history can only be understood in retrospect. While some consequences can be anticipated, many arrive unexpectedly. Behavior analysts were unprepared for the consequences of insurance reimbursement and licensure. Many practitioners have limited knowledge of business practices (e.g., Critchfield, 2015); it is generally not covered in coursework for the profession. While some individuals may have gleaned this information from mentorship or work experience, many are largely unaware of business practice issues. Educational programs that train students in behavior analysis rarely cover issues of business ethics (Ventura & Bailey, 2016). As the field expanded and practices were bought by businesses, a whole new world of challenges arose (Fry, 2022). The field faced issues never before experienced such as fraudulent billing, inadequate supervision, and clinical cost cutting at levels (e.g., Matthews, 2022). These challenges are being identified, and effective solutions will be found.

Certification and licensure remain vital to the field and continue to protect client and practitioners alike. It is still true that certification created a road map for the identification of competencies, and licensure created consumer protection. The field has been improved by these processes and consumers have had access to lifesaving care because of the existence of the profession and the credentials associated with it. The challenge is to gain control of the contingencies that result in poor services and unethical conduct. The good news is that analysis of contingencies is the heart of the science of ABA; we must now apply this defining skill set to resolve the current challenges and to protect the field.

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# Is Accreditation, Like a Colonoscopy, Good for You?

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## Abstract

Accreditation is typically a voluntary process that involves a thorough evaluation of an organization's policies, procedures, and practices. Much like a colonoscopy, the evaluation process probes deep and can be uncomfortable. With the discomfort, time, cost, and effort it takes to undergo evaluation for accreditation, the natural question is whether it is worth doing. In this paper, I will review the history of accreditation and the results of systematic literature reviews focused on the impact of accreditation. I will also discuss how accreditation may help provide quality control in behavior analysis and safeguard against service providers' behaviors being solely shaped by funding sources, such as insurance providers. Lastly, I will provide critical questions consumers can ask to assess accrediting bodies' transparency, objectivity, and fairness when they are seeking accreditation.

**Keywords:**

Accreditation, Healthcare Quality, Behavior Analysis Accreditation, Applied Behavior Analysis Quality, ABA Quality, Behavior Analysis Standards, ABA Standards

## Introduction

Accreditation is usually a voluntary process that involves a thorough evaluation of an organization's policies, procedures, and practices against a set of pre-established standards. Once standards are established, typically, trained, and objective external peer reviewers evaluate an organization's compliance by comparing what they review to the pre-established standards. The process is methodical and reiterative such that as a profession matures, the standards and evaluation process are revised to keep up with the changes in the profession. Accreditation programs can be developed nationally, by the government, by independent agencies authorized to do so by governments, or by independent (for profit, nonprofit, or not-for-profit) national or international agencies contracted by health care organizations (World Health Organization [WHO], 2022).

Accreditation differs from certification and/or licensure even though the aim of all these professional and regulatory organizations is consumer protection (Litvak & Sush, 2023). Certification and licensure hold individual practitioners accountable to a code of ethical conduct. They also set minimum criteria for competency to practice, usually through an examination for entry into the profession and

supervised experience hours. Once certified and/or licensed, the individual practitioner must update their status by providing evidence of continued education in the required subject areas and continued adherence to legal and ethical guidelines. However, licensure and certification do not manage the behaviors of organizations. From a behavioral system perspective, the direct environmental contingencies surrounding the behavior of organizations have the most influence on organizational behaviors. With behavior analysis services, the most immediate contingencies contacted by service providers are what the insurance companies approve or deny and the corresponding insurance requirements (e.g., assessments, reporting). Additionally, many funders have compliance requirements specific to aspects of clinical practice. It then makes sense that clinical practice may be shaped by funder contingencies, which may or may not be aligned with best practice. Service providers may focus on aspects of their service delivery that influence the livelihood of their organization, such as the likelihood of future patient referrals, compliance with insurance requirements to avoid audits, and compliance with authorizations to ensure payment for services. Unfortunately, the requirements set forth by insurance providers are not necessarily in line with best practice recommendations and quality behavior analytic services. Therefore, it makes sense to have a specific set of standards and a process in place for shaping organizational behavior to adhere to best practice recommendations. Accreditation arranges contingencies for service providers to demonstrate that they adhere to standards of excellence and best practices in behavior analysis. For example, service providers are not specifically paid by insurance and funding entities to provide ongoing training to their clinical staff. What is worse is that investment in training staff may inadvertently be punished by the high staff turnover. However, the efforts and investment of organizations that continue to provide sufficient training to their staff are acknowledged through the accreditation process. For another example, see the section on ethics, integrity, and professionalism in the Standards of Excellence (Behavioral Health Center of Excellence [BHCOE], 2022).

The concept of accreditation in the United States is more than a hundred years old and emerged from concerns to protect public health and safety. Accreditation is carried out by private, not-for-profit, or nonprofit organizations designed for this specific purpose. In 1917, the "Minimum Standard for Hospitals" was developed by the American College of Surgeons (ACS). It was a set of guidelines establishing minimum standards for hospitals in the United States. To develop the guidelines, a committee of 21 surgeons, hospital administrators, laboratory workers, statisticians, and leading hospital superintendents met for two days in Chicago to formulate a set of questions that would enable them to obtain hospital data to consider a "minimum standard." These standards were designed to ensure that hospitals were equipped and staffed to provide safe and effective care to patients. The "Minimum Standard for Hospitals" included guidelines for hospital size, equipment, and staffing levels, as well as recommendations for the types of services that hospitals should provide. The standards also established requirements for the training and education of hospital staff, including doctors, nurses, and other healthcare professionals (for more information regarding ACS's efforts, the minimum standards, and historical images of the notes, see Wright, 2017).

The "Minimum Standard for Hospitals" was a groundbreaking effort to improve healthcare quality in the United States, laying the foundation for developing more comprehensive accreditation standards. The ACS was pleased to find an immediate interest in compliance with the standards, even though compliance was entirely voluntary and sending out college staff to conduct evaluations and provide consultations was labor-intensive and costly. The immediate adoption of accreditation was likely because hospitals had an opportunity to help formulate the standards, and their competitors were doing it (Wright, 2017). Today, hospitals in the United States must meet a wide range of standards to be accredited, including standards related to patient safety, quality of care, and healthcare outcomes.

The ACS hospital standardization project was an essential framework for hospitals for three decades before evolving into The Joint Commission on Accreditation of Hospitals in 1951, which was renamed The Joint Commission on Accreditation of Healthcare Organizations in 1987, and The Joint Commission in 2007. In the decades since its establishment, the Joint Commission has become one of the country's most widely recognized accrediting bodies for healthcare organizations. Other accrediting organizations have also been established over the years, including the Commission on Accreditation of Rehabilitation Facilities (CARF), Utilization Review Accreditation Commission (URAC), the National Committee for Quality Assurance (NCQA), and Council on Accreditation (COA).

In healthcare, the movement toward standardization and accreditation was to question the status quo and to improve patient care (Lenaway et al., 2007). Today, accreditation for healthcare services is most often required by payers, such as insurance providers, as a condition for reimbursement. In cases when it is not required, some healthcare organizations seek accreditation to renegotiate or obtain higher reimbursement rates from funding entities. Also, some organizations choose to seek accreditation voluntarily to demonstrate their commitment to quality and to improve their own performance. In

line with this movement in healthcare, educational institutions, licensure boards, and certification bodies have all moved toward requiring accreditation as a means of quality control (Eaton, 2015; Ibrahim, 2014). The accreditation process, however, is costly, and it involves much time and effort from the accrediting body, the evaluators, and the organizations seeking accreditation. It is no wonder that accreditation evaluation can be compared to a colonoscopy because an organization must allow an objective third party to look at all its intimate parts, including its procedures, policies, and practices. The question is, does this cumbersome and costly process increase the quality of care?

*First, what is Healthcare Quality?*

Healthcare quality is a broad concept that has been defined by the National Academy of Medicine as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Centers for Medicare & Medicaid Services [CMS], 2021, What is quality improvement? section). Like the seven dimensions that define applied behavior analysis proposed by Baer et al. (1968, 1987), a physician by the name of Donabedian (1990) proposed the seven attributes of health care that define healthcare quality. These dimensions were later adapted by the Institute of Medicine (2001) and included safety, patient-centeredness, timeliness, equity, access, efficiency, and effectiveness. Accurate assessment of healthcare quality is challenging, but the CMS has proposed various frameworks for improving outcomes and conducting quality measurements (see CMS, 2022;). In the meantime, as efforts to improve measurement continues, hospital accreditation which incorporates adherence to the seven dimensions has become adopted worldwide to assess and improve healthcare service quality (Lam et al., 2018).

*What Has Been the Impact of Accreditation on Healthcare Quality?*

Accreditation methodologies vary across accrediting bodies and typically rely on the organization seeking accreditation to provide documentation of procedures and policies. Therefore, the research evidence in the published literature evaluating the effectiveness of accreditation for patient outcomes is mixed, and the results should be interpreted with some caution (Araujo et al., 2020). Additionally, accreditation takes a bird's view of an organization; thus, it does not guarantee that best practices will be followed daily (Hinchcliff et al., 2012). One long-standing challenge to producing robust research evidence on the impact of accreditation has been the absence of patient-level data on both accreditation status and patient outcomes (Bracewell & Winchester, 2021). A more appropriate mechanism for evaluating patient outcomes seems to be value-based care (VBC) and payment models whereby service providers are incentivized to submit patient-level data for quality measurement and patient-level analyses (see Litvak, 2023).

Despite the challenges in evaluating the impact of accreditation, the results of systematic literature reviews suggest that healthcare accreditation may have a positive impact on several important aspects of healthcare (see Araujo et al., 2020). In their literature review, Araujo et al. (2020) initially reviewed 943 citations from eight different databases. Araujo et al. only included 36 studies in their final review that used quantitative methods to compare accredited vs. nonaccredited hospitals on the seven healthcare quality dimensions. They found that accreditation had a positive impact on five of the seven dimensions, including efficiency, safety, effectiveness, timeliness, and patient-centeredness. Some earlier systematic literature reviews have also found that accreditation programs improve the process of care and clinical outcomes of a wide spectrum of clinical conditions (Alkhenizan & Shaw, 2011). In the field of education, the literature also suggests that accreditation of educational institutions may have a positive impact on educational services by cultivating accountability, encouraging continuous self-reflection and improvement, and increasing access to educational opportunities (e.g., Ülker, 2020).

In a recent survey conducted by NORC at the University of Chicago for The Public Health Accreditation Board (PHAB), 98% of applicant health departments expected the accreditation process to increase quality improvement processes and 76% reported continued engagement in quality improvement activities four years after accreditation (Gonick et al., 2020). The World Health Organization (WHO) suggests that healthcare accreditation should be recognized as an ongoing process of quality improvement vs. simply a status (e.g., whether an organization is accredited) and thus supportive of the perpetual process to improve the quality of care provided. Furthermore, it is recommended that accreditation standards and subsequent reaccreditation processes systematically measure improvement over time (WHO, 2022).

In general, the results of literature reviews and recommendations of organizations such as the WHO suggest that accreditation impacts health quality in a positive way. However, it is unclear how accreditation directly impacts the quality of care and achieves improved outcomes for patients and organizations. Some of this may be easy to infer. For example, in their review, Cabana et al. (1999) found that there were about 300 potential barriers physicians reported when asked about adherence to clinical practice guidelines.

Bracewell and Winchester (2021) suggested that one of the ways accreditation may improve outcomes is by reducing some of these types of barriers. That is, physicians' lack of awareness of newer practice guidelines because of a fast pace evolving literature may be overcome through discussions about accreditation standards and requirements to pass. Additionally, the accreditation evaluation process itself may set the occasion for open discussions and change the focus to improvement (Hovlid et al., 2020).

Outside of patient data, however, there is evidence that accreditation is valuable and pays off both financially and non-financially in terms of higher quality care, improved client outcomes, and increased compliance. In 2021, the Joint Commission contracted with the ROI Institute (see https://roiinstitute.net/) to conduct an evaluation of a sample of behavioral health organizations to report on the ROI of accreditation. The key findings, based on 180 behavioral health organizations, were that the ROI was 623%, which is a benefit-cost ratio of 7.23. In other words, for every dollar spent, the dollar is returned plus an additional $6.23. The main areas of impact included improved competencies of staff and supervisors, reduced staff turnover, improved reimbursements, increased revenue, risk reduction, and improvements in operational efficiencies (ROI Institute, 2022).

*What are some Pros and Cons of Accreditation?*

Accreditation can be valuable in several ways. It is a process through which an organization is evaluated against a set of standards to ensure that it meets certain criteria and is adhering to best practice standards. This process is designed to help ensure that the organization is operating at a certain level of quality and demonstrates that the organization is open to being reviewed and receiving and acting upon external feedback from a third party.

One of the possible benefits of accreditation is that it provides assurance to patients, parents, and other stakeholders that the accredited organization meets certain standards of quality. Second, accreditation can help an organization to improve continuously by providing a framework for self-assessment and the identification of areas for improvement. Third, accreditation can help reduce the risk of errors and improve patient safety by ensuring that organizations have processes in place to identify and mitigate potential risks. Fourth, accreditation often sets the occasion for conversations that lead to the standardization of processes, procedures, terms, and titles, which reduces redundancies and ambiguity and increases efficiency and transparency in a profession. Fifth, accreditation can promote professionalism within an organization by encouraging staff to adhere to best practices and guidelines, just as the organization sets an example by adhering to them for accreditation. Lastly, it can increase the credibility and reputation of an organization by demonstrating that it has met certain standards of quality. If the organization is an internship site or offers supervised experiences for students, accreditation can provide greater recognition that the organization meets certain standards for training and supervision, which can improve the quality of the fieldwork supervised experience for individuals accruing hours to sit for certification and/or licensure. This can be especially important for students who are seeking to gain valuable clinical experience and build their professional careers.

Accreditation can also have some possible downsides. First, one of the disadvantages of accreditation is that it can be a costly process. A thorough evaluation of an organization's policies, procedures, and practices takes time and resources from the accrediting body. Therefore, accreditation involves application fees for the organization seeking an accreditation evaluation. Additionally, the organization must invest time and resources to prepare for the accreditation process and respond to the evaluation feedback. Second, the accreditation process, like a colonoscopy, is thorough and may be uncomfortable as a third-party observes some of the most intimate parts of an organization, including internal documents, correspondences, grievance procedures, training logs, supervision materials, leadership guidelines, and more. Third, accreditation does not guarantee quality because it is a snapshot in a moment in time and may miss day-in and day-out activities for specific clients or staff. Fourth, accreditation is not always recognized by all organizations or may not be required yet, which minimizes the potential of accreditation to help establish credibility. Lastly, there is a price to standardization, especially if the standards and the accreditation evaluation process do not leave room for flexibility and clinical judgment. There is a fine balance to strike with standardization to ensure appropriate customization and person-centered, individualized care. If that balance is off, accreditation may place barriers for small and innovative organizations and tip the balance toward a one-size-fits-all approach in patient care.

Just as with anything else in life, including consenting to a colonoscopy, there are always pros and cons. It is crucial that service providers and stakeholders interested in accreditation are aware of the pros and cons to help shape the accrediting bodies' standards and evaluation process to minimize the cons and strengthen the pros.

*Is Accreditation Right for Applied Behavior Analysis?*

As previously discussed, accreditation is a process by which organizations demonstrate that they meet certain standards of quality and safety. Therefore,

it makes sense for each healthcare profession to have specialized accreditation to ensure that the organizations seeking accreditation adhere to quality care as per the specific industry regulations and the profession's best practices. For example, for colonoscopy, the primary accreditation bodies are the America College of Gastroenterology (ACG) and the American Society for Gastrointestinal Endoscopy (ASGE). Both accrediting bodies have the same goal of ensuring that providers meet specific standards for patient care and safety, as well as for the technical quality of the procedures. Although a general healthcare accreditation would ensure patient safety, it would not include specific best practice guidelines and the technical aspects of the field of Gastroenterology. Similarly, organizations providing behavioral healthcare can pursue general healthcare accreditation, which would help assess and improve the organization's general patient safety and organizational policies. However, an accreditation specific to behavior analysis would also include profession-specific evaluations of best practices (e.g., use of non-harmful reinforcers, supervision caseload, care coordination, collaboration). One of the advantages of a profession-specific accreditation for behavior analysis is that it would set the occasion for discussions and agreements about profession-specific titles and terminology. Another benefit of profession-specific accreditation for behavior analysis is that stakeholders such as patients, parents/caregivers of patients, and patient advocates would be able to have a source to refer to when they are trying to identify quality service providers. Usually, accrediting bodies provide information to the public that also promotes awareness of quality service provision (e.g., https://www.bhcoe.org/parent-autism-quality-aba-providers/; BHCOE, n.d.). Lastly, stakeholders interested in evaluating best practices in behavior analytic care can review published standards, which have been developed specifically for behavior analytic services; for example, see BHCOE/ANSI 201: Standards of Excellence for Applied Behavior Analysis Services, which have been adopted by ANSI as an American National Standard (BHCOE, 2022). Also, see the Autism Commission on Quality Accreditation program Standards and Guide (version 1; https://autismcommission.org/standards/) and Standards for Interprofessional Collaboration in Treatment of Individuals with Autism (Bowman, Suarez, & Weiss, 2021).

*What are Some Things to Look for in an Accreditor?*

Overall, it seems clear that accreditation in behavior analysis would provide oversight of behavior analytic services at the organizational level and improve patient care. However, it is important to note that not all accrediting bodies are equal. Below, I have outlined some important questions consumers should ask as they consider accreditation (for a brief summary of these questions, see https://www.bhcoe.org/2022/08/top-questions-for-aba-providers-to-ask-when-choosing-an-accreditation-program/, or https://accreditationguru.com/10-steps-to-selecting-an-accrediting-body-2/) (ANSI, 2022; BHCOE, 2022).

*Does the accrediting body hold accreditation or receive feedback from an independent body that reviews its performance?*

From a behavioral perspective, every organization that potentially has control over contingencies that shape service providers' behaviors is at risk for abuse of power. It is important to have a checks and balances system in place to ensure that power is shared and there is oversight. For a balanced approach, it is important that the accrediting body is overseen by independent parties informed of the accreditation process and best practices in standard development and evaluations. For example, a hallmark of a credible accreditation program is that they hold accreditation by the American National Standards Institute (ANSI), which promotes transparency in how standards are developed and how public comments and feedback are incorporated (Litvak & Sush, 2023). ANSI is a private organization that administers and coordinates the U.S. system of voluntary professional standards and evaluation. Although ANSI itself is not a standard developing organization, it provides a framework for fair standard development and quality evaluation systems. ANSI safeguards the integrity of organizations that develop standards and is a neutral venue for coordinating standards and promoting collaborative efforts in standard development. In addition to including stakeholders whose lived experiences are invaluable insight for developing standards, the accrediting body must guide standard development by providing the commission with results of thorough literature reviews and best practice recommendations.

*Is the evaluation methodology valid?*

Large-scale evaluation of an organization's procedures, processes, and practices is not an easy feat. Thankfully, there is a literature base to guide large-scale program evaluation to ensure reliability and validity regarding measurement and accreditation decisions. In fact, there are empirical journals solely dedicated to quality, comparability, and evaluation for accreditation, but many of these journals are profession specific. For example, The Journal of Accreditation and Quality Assurance provides information on all aspects of quality, transparency, and reliability of measurement results in chemical and biological sciences. The journal also includes fields such as nutrition, consumer protection, pharmacy, forensics, and laboratory medicine. Science and Engineering Ethics focuses on education, research, and practice in engineering. Quality Assurance in Education focuses on education

at all levels (e.g., primary, higher, professional). Joint Commission Journal on Quality and Patient Safety focuses on the quality and safety of healthcare.

Taken together across the literature, commonalities exist in what is considered good measurement science and program evaluation. Some best practice recommendations include employing leadership services with experience in quality assurance and evaluation methodology. With the evaluation process itself, it is important to involve all stakeholders (e.g., patients, technicians, supervisors, and leadership) and to incorporate all voices using a multi-informant approach. Furthermore, a multi-dimensional approach to evaluation helps increase assessment validity (Cumming & Miller, 2019; Shryock & Reed, 2009). For example, an accreditation evaluation based on self-assessment and self-report is much more limited than an evaluation based on self-assessment, direct observations of therapy/treatment, open-ended interviews, and surveys. The multi-dimensional approach to assessment increases the acceptability of the accreditation decision, thereby increasing the validity of the results when there is reliability across dimensions and informants. At a minimum, it is best to include both direct and indirect assessment methods for evaluating if an organization's practices, policies, and procedures adhere to the profession's standards. Lastly, there are many key players within accrediting bodies, it is essential that the individual(s) responsible for overseeing the accreditation program, including but not limited to standard development and maintenance, evaluation methodology, compliance, procedures, and processes, have educational and professional experience in quality assurance, quality measurement, and evaluation methodology.

*Is the accreditor an independent neutral entity, which helps make the accreditation decision fair?*

In any profession, there are a limited number of professionals, and it is difficult to develop neutrality and independence when the limited number of professionals shift and change positions in their careers. However, it is imperative for accrediting bodies to be neutral, objective third parties that do not personally benefit from setting the professions' standards and accreditation evaluation methodology. To have credibility, the accrediting body should not be owned or operated by an organization representing a specific group of stakeholders such as payors, service providers, or patients. Furthermore, the evaluators cannot be employees from other organizations who provide services to the same population or work for a competitor. Such practices protect the evaluation process and limit any influence of potential biases and conflicts of interest. Lastly, it is crucial for the accrediting body not to have dual relationships or organizational biases toward certain trade organizations, certification or licensing bodies, or professional associations.

*How long has the accreditor been evaluating organizations?*

It is important for the accrediting body to have demonstrated a history of viability for continued successful operation and stability. Any reader who has taken some time to develop tools for measuring behavior can relate to the time and experience it takes to develop a behavior measurement system that is reliable and valid. Developing evaluation tools for accreditation, similarly, requires time and experience in large-scale evaluations. Additionally, developing tools that enable trained evaluators to reliably make high stake decisions of pass/not pass requires piloting and obtaining a representative sample, several revisions to tools based on the results, and revisions to the tools and/or methodology based on stakeholder feedback. It can take years to develop reliable evaluation tools that are informative, fair, and socially acceptable. Organizations should ensure that accrediting bodies have spent years developing and self-assessing and revising their tools.

*Does the accreditor have an independent disciplinary review or compliance committee?*

When a credentialed clinician does not adhere to the credentialing board's code of ethics, the witness of the violation can submit a formal complaint outlining the clinician's behaviors alleged to violate the code of ethics, documentation for the alleged violation, and documentation of attempts to bring the issue to the clinician (for example see https://www.bacb.com/ethics-information/reporting-to-ethics-department/; Reporting To The Ethics Department, 2023). What about when the violation is conducted by individuals who are not clinicians or credentialed? Who oversees grievances or complaints against service organizations, sometimes owned or operated by leadership who are not certified or licensed behavior analysts? The role of the disciplinary review or compliance committee of an accrediting body is to process compliance concerns received from the general public, patients, parents/caregivers, and staff to assist accredited organizations to remedy any problem areas as well as provide continued support to allow for growth and quality improvement. Although it may not be at the forefront when choosing an accreditation program, it is essential that the accrediting body has a committee to oversee organizations' adherence to the standards under which they have been evaluated. As noted before, accreditation evaluation only provides a birds-eye view from a mere snapshot in time; therefore, a compliance review department enables the accrediting body to promote accountability and adherence to the standards across time (for example, see https://www.bhcoe.org/become-a-bhcoe/report-a-compliance-concern/; BHCOE, 2022).

*Does the accreditor demonstrate good customer service?*

It may not seem important initially, but good customer service is crucial. The organization undergoing the accreditation process may have questions or concerns throughout the evaluation. It is important that they can receive answers promptly. It is also important for customer service personnel to consist of standards experts, a support team, resources, specific examples, and someone who oversees their account. Another key component to an accrediting body demonstrating good customer service is a modality for organizations to be able to provide ongoing feedback throughout and following the evaluation process. Furthermore, it is crucial that the accreditor not only solicits and encourages feedback but also can demonstrate how the feedback has been utilized to promote improvements.

*Has the accreditor been considered or approved by federal and/or local/state authorities?*

Lastly, organizations should seek out an accreditation body whose standards align with their applicable federal, state, and local mandates in the regions that they operate to ensure compliance and consistency with both mandates and best practices.

## Summary and Conclusions

The answer to the question of, "is accreditation, like a colonoscopy, good for you?", is yes, absolutely! Accreditation will provide a contingency for organizational behavior and allow the profession of behavior analysis to shape the quality-of-service delivery instead of funding organizations. Accreditation will also catapult discussions between behavior analysts to standardize terms and come to some consensus regarding how they reference common procedures, much like the BCBA Task List from Behavior Analyst Certification Board (Behavior Analyst Certification Board [BACB], 2017). Accreditation will also provide transparency into the profession and what the profession itself considers best practice. Ultimately, transparency regarding best practices in service delivery will influence patient outcomes and quality of care. Currently, there is no way for a consumer, or a funding agency, to differentiate between service providers outside of personal relationships and anecdotal data (e.g., testimonials, word of mouth). However, just as an accrediting body can hold service organizations accountable, it is equally important that service providers hold the accrediting bodies to standards of excellence to mitigate potential negligence and abuse of power.

In conclusion, like a colonoscopy, accreditation allows for the assessment and identification of problems, which can prevent the widespread growth of problems through intervention. Most organizations providing behavior-analytic care are highly patient-centered and focused on delivering excellent treatment. However, the rare bad seeds influence the public's perception of behavior analysis and cultivate widespread criticism. Unfortunately, bad news and reports of poor behavior spread quickly, like cancer, undermining the efforts of organizations that provide excellent services. Although undergoing accreditation may not feel pleasant, it can prevent the spread of cancer, and I would argue that it is good for the profession of behavior analysis and its future vitality.

## Author Note

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## RETRACTION

We would like to inform you that the article titled "Private Equity Investment: Friend or Foe to Applied Behavior Analysis?" published in volume 15, issue 3, pages 267-275 (https://doi.org/10.26822/iejee.2023.299) of our journal has been retracted by the authors and the special issue editors.

The author, Sara Gershfeld Litvak, has decided to retract the article due to her commitment to scientific integrity and ethical values. The decision to retract the article was made after a rigorous review process by the authors.

In line with our responsibility to the scientific community, we aim to ensure transparency and accuracy in knowledge dissemination by sharing this retraction notice. Retractions of this nature are an important step in maintaining the quality and reliability of the scientific process.

We apologize for the need to inform you about the retraction of this article and want to emphasize our sensitivity to any potential misunderstandings that may arise. It is crucial for scientists and researchers to acknowledge their errors and take necessary corrective actions to ensure the healthy progression of scientific knowledge.

Our journal remains committed to supporting the scientific community and upholding transparency and ethics in such processes.

Best regards,

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# Improving the Methodological, Analytical, and Cultural Impact of Behavior Analysis Via Utilization of Group Design Methods and Statistical Analyses

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## Abstract

The multi-decade debates within the field of behavior analysis as to the possible value and threat of group design methodology and statistical analyses on the purity of the field have weakened the discipline's maximal impact on the world. This paper rebukes the concerns and suggests that through such adoption behavior analysis may likely better achieve its world-changing ideals, and pragmatic initiatives. We begin with a historical trace of the current debate and describe the pros and cons to design/analysis inclusion, frame such matters within the context of contemporary issues which applied behavior analysts find themselves concerned, and ultimately put forward means by which broader, and perhaps more impactful, research questions can be asked and interpreted.

**Keywords:**

Group Design Methodology, Research Design, Statistics, Single-Subject Design

## Introduction

One of the most distinguishable characteristics of the field of behavior analysis is its reliance on a research method approach entitled "single-subject design" (Cooper et al., 2007; DeRosa et al., 2019). This exploratory approach is not to be confused with a case study (Bolgar, 1965) whereby a single individual is studied in an uncontrolled manner and simply reported upon afterwards. Single-subject design (SSD) approaches to research questions instead systematically analyze the repeated effects of an independent variable on a dependent variable across one or more individual subjects (Cooper et al., 2007). This cluster of techniques are employed within the field because of the concerns that many of the field's founders had regarding the limitations of traditional research methods – often described as group or statistical research methods (Sidman, 1960; Skinner, 1956). In the early days of behavior analysis, B. F. Skinner himself recommended this departure from traditional psychological statistical methods and analysis because:

> *You cannot easily make a change in the conditions of an experiment when twenty-four apparatuses have to be altered. Any gain in rigor is more than matched by a loss of flexibility. We were forced to confine ourselves to processes which could be studied with the baselines already developed in earlier work. We could not move on to the discovery of other processes or even to a more refined analysis of those we were working with. No matter how significant might be the relations we actually demonstrated, our statistical Leviathan had swum aground (Skinner, 1956, pp. 113-114)*

Essentially, Skinner was concerned that the analysis of the group did not provide meaningful analysis of any of the group members, and as such little could be discerned about the behavior of the single subject. And to Skinner, that single subject mattered as it was the level of analysis that appeared to be necessary for evaluating and changing behavior. Today the utilization of SSD reaches far beyond behavior analysis into other clinical and helping professions such as social work and health care (see Bloom et al., 2009 for a textbook length treatment).

There is no debate we wish to have over the utility of the SSD as a method within the field of behavior analysis, as the approach has been of great utility for decades in crafting a precise analysis of the controlling variables on an individual's behavior. Furthermore, we make no dismissal over clear discoveries that such a research tradition has allowed for in the field's history (e.g., functional analysis and intervention; see Beavers et al., 2013 for a review of literature of functional analysis). We do, however, have concern that the overreliance on SSD and omitting the inclusion of more traditional research designs has marginalized the impact the field is having on matters of great concern to behavior analysts. For our work to be taken more seriously beyond the walls of our own discipline, we may need to start writing, speaking, and describing our results in broader non-technical language, and look carefully at what is gained and lost by the specific research design chosen by the researcher. This approach is not meant to imply defeat or suggest minimizing of our research endeavors, but rather simply to greatly embrace the very core elements of what it is to be a pragmatic behaviorist – functional utility.

Beyond the initial proclamations by Skinner regarding research methods, many well-known scholars have spoken out against the incorporation of group designs into the field. In the late 1990s, a group of presenters at the annual Association for Behavior Analysis convention debated the adoption of these "non-behavioral" methods, and their views were eventually assembled within a special section of one of the field's peer-reviewed journals. In this special section of papers, a range of opinions are presented with repeated concerns being made about loss of understanding the behavior of the individual person (Branch, 1999; Perone, 1999), and inferencing beyond the data (Ator, 1999; Branch, 1999; Davison, 1999), and the additional distraction that statistical analyses create (Perone, 1999) as a drift away from SSD could have for the field. Only an occasional pro-group design approach was presented (Crosbie, 1999), and statements as such hinted at a potential fractioning that might be underway even within the field of behavior analysis. More recent discussions on the superiority of SSDs have echoed similar sediments (Kyonka et al., 2019). Examples of group design methods and statistical analyses will occasionally appear in behavior analytic journals today (e.g., Dixon et al., 2022; Jang et al., 2012, Sutton et al., 2022; Silverman et al., 2007; Yi et al., 2022), yet they are a minority compared to the continued use of SSDs throughout. Even with such examples appearing within our own collection of scholarly journals, most behavior analytic textbooks fail to describe the rationale and usage of group methods and analyses for behavior analysts (Cooper 2007; Mayer et al, 2019; Sidman, 1960; yet see Belisle et al, 2021 as an exception) – thus potentially limiting an awareness of value and an understanding of how to construct research questions utilizing group designs.

The current social and political environment often has placed the field of behavior analysis in its crosshairs. We are increasingly being described as a field of insensitive determinants of client autonomy (Kirkham, 2017; McGill & Robinson, 2021), responsible for the development of alleged trauma in former clients (Kupferstein, 2018), insensitive to racial injustices (e.g., Čolić et al., 2022; Zarcone et al., 2019), and behind trends of interest that need to be more fully addressed and analyzed (e.g., DeFelice & Diller, 2019; Fontenot et al., 2019; Kornack et al., 2019; Morris et al., 2021; Wang et al., 2019). Even our most heavily dominated applied appendage – autistic care – is being challenged as non-effective (United States of America Department of Defense, 2021). Critics from within and beyond the field itself seem to believe that perhaps behavior analysis has not aged well in a fast-changing and culturally evolving society. We are clear of the risks that any field of inquiry may encounter when it too quickly drifts from historical roots because of modern themes and current interests. Yet on the other hand, a field which ignores the critique of itself by its own members suggests that a possible reappraisal may be indeed necessary. And furthermore, if the field's reaction to such criticism is with rhetoric and not data, increased dismissal of the utility and value of the overall field may result. Even those who speak up about creating change in the discipline (e.g., Jaramillo & Nohelty, 2022; Mathur & Rodriguez, 2022; Pritchett et al., 2022; Wright, 2019), doing better than in the past (e.g., Baires et al., 2022; Li et al., 2019), or improving inclusivity (e.g., Deochand & Costello, 2022; Levy et al., 2022; Lovelace et al., 2022) cannot and should not rest

after such assertions alone, but only after producing data by which to support such claims. We believe that only through data that change will occur at the magnitude of impact that appears desired, and most importantly the type of data that will yield the greatest change-making potential will be gathered using between group, large sample sized research designs and statistical analyses.

Many of the most impactful contributions in terms of scalability to improving the human condition have occurred when behavior analysts have adopted non-SSD approaches to demonstrating effects of the independent variable. One example involves the use of contingency management for the treatment of substance use disorders (e.g., Dunn et al., 2008; Higgins et al., 1994; Higgins et al., 1991; Ledgerwood et al., 2008). In many of these published studies, a comparison is made between groups of individuals assigned to either a traditional treatment condition in which participants receive drug treatment as usual (e.g., standard relapse prevention support, health risk education, group meetings, and individual counseling sessions), or a contingency management condition wherein abstinence behaviors resulted in payment in the form of vouchers exchangeable for community retail items (see Higgins et al., 2019 for a recent review of the literature). Related studies on analyzing the choice making of drug users have also centered around non-SSD methods and analyses (e.g., Heil et al., 2006; Nighbor et al., 2019; Thrailkill et al., 2022; Yoon et al., 2007). Another example of behavioral solutions that have been quite successful at achieving wide-scale acceptability and adoption is using relational framing techniques to treat mental and physical health conditions under the auspices of Acceptance and Commitment Therapy (Dixon et al., 2023). This treatment approach has almost exclusively utilized between-subjects research methods (see Twohig et al., 2007 as an outlier in its use of SSD), and gathered enough data to be deemed as effective enough for the World Health Organization (WHO, 2020) to distribute ACT self-help material in 21 languages "for anyone who experiences stress, wherever they live and whatever their circumstances" (p. 5). A final example comes from Positive Behavior Intervention and Supports (PBIS; Horner & Sugai, 2015) whereby social-culture and behavioral supports are implemented school-wide (Tier 1 and Tier 2) and at the level of the individual (Tier 3) to promote improved educational and social outcomes. Many documented successes of this work are presented with group designs speaking to comparisons made between non-PBIS exposed and PBIS exposed student groups of varying demographics, whereby the PBIS exposed students tend to fair better regarding social-emotional functioning, behavioral concerns, academic performance, bullying and peer rejection, and prosocial behavior (Bradshaw et al., 2010; Bradshaw et al., 2012; Horner et al., 2009; Waasdorp et al., 2012). Many more examples of behavior analytic researchers who have stretched beyond the SSD research tradition can be found in the context of functional analysis (Kurtz et al., 2013), gambling (Habib & Dixon, 2010), and The Good Behavior Game (Joslyn et al., 2019). All of this is not to suggest that SSD themselves do not yield utility for better understanding of human behavior. We completely agree that SSD has a crucial role to play in the behavior analysis of today and tomorrow. However, we also must accept that in order to advance beyond our current limited impact we have made to changing the world through behavioral science (Dixon et al., 2018), that we should look carefully at what many of our most successful endeavors all appear to have in common – group research designs.

Single-subject research designs have limitations related to the generalizability of the study findings as well as the methodological constraints that limit the use of inferential statistical methods. Conclusions can hardly be made regarding a group or groups of subjects, as the baseline logic (Cooper et al., 2020) underneath most SSDs fundamentally focuses on inferencing the likelihood that a procedure is responsible for producing the observed changes at an individual level. This does not speak to the likelihood that a similar effect can be observed when such a procedure is applied to the population, the group of individuals upon whom behavior analysts wish to bring socially significant changes. To a certain degree this limitation is mitigated through systematic replications. Population-level inference is usually drawn by first randomly sampling the target population to create a group of subjects and then using the changes observed in the group under the procedure to make inferences about the likelihood of whether the population will respond in similar ways. Additionally, the field of applied behavior analysis (ABA) takes pride in its continued use of technical terminology which has largely allowed behavior analysts to effectively communicate with other behavior analysts. However, this technical language may be a barrier preventing behavior analysis to reach professionals from other disciplines (Becirevic et al., 2016). Historically, this insular vocabulary and research approach were the very reason the field crafted its own scientific journals (e.g., Journal of Applied Behavior Analysis, Journal of the Experimental Analysis of Behavior) to combat the inability to publish its research using SSDs in more traditional psychology journals that were departing from a behavioral tradition (Gollub, 2002).

All the positive features of group design and analysis do not imply that shortcomings of the approach fail to exist. Issues of sample representation, clinical/practical significance, effect sizes, maintenance, functional control, and generalization all remain ripe for continued debate. In conclusion, we believe that the

benefits of incorporating group designs and analyses outweigh the limitations – and as such, behavior analysts can advance further towards having a positive impact on the world by incorporating these sorts of methods into the means by which they speak to matters of interest, react to critics, and advocate for behavioral solutions to non-behavioral audiences.

*Group Designs in Behavior Analytic Settings*

In contrast to single-subject designs, quantitative studies using group designs use variables among participants within one group or across multiple groups to examine the impact of independent variables on dependent variables. In order to aggregate these data, various descriptive and inferential statistical methods are used to provide a relatively objective interpretation. There are many nuances in how group design studies are categorized and the different optimal statistical methods that go with them, such as complex mixed designs better analyzed using structural equation modeling (Duncan, 1969) and time series designs (Gottman et al., 1969). In this section, though, we primarily focus on three types of group design in their basic forms: within-subject group design, between-subject group design, and mixed group design. We also provide a brief description of the design, common statistical methods used, a sample question that can be studied using this design, and how this research method can be used to address some contemporary issues surrounding our field.

*Within-Subject Group Design*

The concept of a within group research design is that individual subjects are evaluated multiple times during the experiment. Such a design is more similar to an SSD than other sorts of group designs, whereby the individual subject is only examined once and compared to other subjects. Here in a within group design, a group of subjects may be exposed to one same independent variable multiple times, a range of levels of an independent variable, or a combination of variables. For example, 20 children with attention-deficit/hyperactivity disorder (ADHD) may be exposed to behavioral interventions for 8 weeks, and also medication for 8 weeks. The order of delivery of treatment may be randomized across the entire 20 children, and after exposure to both (i.e., 16 total weeks), an analysis could be made as to which sort of treatment was better in terms of outcomes on a dependent variable (e.g., performance, attention in class, parent reports of homework completion). Variations of this basic framework could include comparing low and high doses of ADHD medication, comparing behavioral treatment alone to behavioral treatment with medication, a period of no-treatment to that of behavioral treatment, or even low and high doses of behavioral interventions alone.

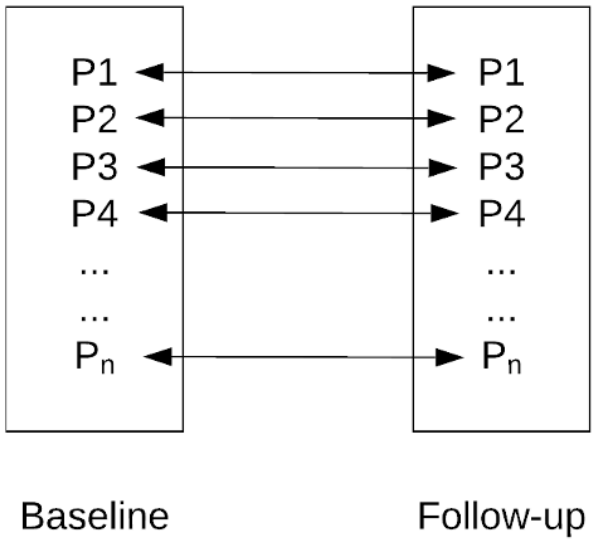
As these examples illustrate, in a within-subject group design, dependent variables are collected from participants within one same group assignment, sometimes across multiple time points. Participants are usually selected based on similar criteria (e.g., demographic compositions, existing conditions, exposure to similar interventions), and statistical methods are used to compare the relationships of group-level measures across multiple time points or to identify patterns and relationships among different variables. Using within-subject group design, behavior analysts craft purpose statements such as evaluating treatment progress over time for one group of participants, identifying relationships between outcome measures and potential predictors, and evaluating the extent to which measurements used are reliable and accurate. In contrast to SSD which heavily relies on visual inspection of the data obtained to determine effects of the intervention, group designs supplement the visual graphical differences that are plotted through the use of statistical procedures. Most commonly, these questions can be answered using the data obtained through repeated measure T-tests, simple linear regression, and correlation analysis. To comprehensively discuss these statistical methods is beyond the scope of the current paper, and interested readers are highly encouraged to reference statistics textbooks in psychology or education (e.g., Howell, 2012). Here we present examples with from published peer-reviewed articles to briefly discuss these study's conceptualization and statistical analysis process, as well as suggestions on how similar investigations can be made to address some emerging research questions and challenges the field faces.

*Treatment Progress Overtime*

Consider the following scenario: A behavior analyst is interested in evaluating whether a comprehensive treatment model (CTM) newly introduced at their clinic effectively produces measurable gains among a group of autistic learners. Although such a question can be examined by individually evaluating the outcome measures of each learner, it might be difficult to aggregate such data due to insurance reimbursement or comparisons across agencies when some learners are showing improvement in outcome measures, and some are showing decreases. Furthermore, with varying baseline measures, it is difficult, if not impossible, to control for the potential differing effect of the intervention on learners with varying abilities. Although interpretations can be made by categorizing learners into different groups and evaluating the change in the outcome measure's level, trend, and variability, as routinely done in visual analysis (Cooper et al., 2020), such interpretation is largely subjective in nature although some tools have been constructed to improve objectivity (Dowdy et al., 2022).

A within-subject group design will be a good fit in scenarios like this. In this case, the investigator will gather all learners' (i.e., population) or randomly select a subgroup of learners' (i.e., sample) data before and after the implementation of the CTM. Here we would compare each learner's follow-up measure against their baseline measures, and the most common will use repeated measure T-tests to detect whether there are statistically significant changes between the two time points. For example, Yi et al. (2022) investigated the impact of ABA service embedded within the student's Individualized Education Program (IEP) using data obtained from a public school. A repeated measure T-test showed a statistically significant difference between students' performance at the beginning and the end of the school year. Figure 1 illustrates the comparison being made in this scenario.

**Figure 1.**
*Illustration for using within-subject group design to evaluate changes for a group of participants between baseline and follow-up.*




Within-subject designs using similar methods to evaluate participants' outcomes over time can have meaningful impact in the contemporary field of behavior analysis. There has been increasing attention in using behavior analytic principles to address social issues such as systematic racism (Shea et al., 2022), as well as critical reflections on the research and clinical practice of behavior analysis among the Black community (Čolić et al., 2022; Lovelace et al., 2022). Čolić et al. (2022) synthesized black caregivers' experience when it comes to autism care and provided specific accounts on racism manifested across its multiple stages. Čolić et al. provided multiple examples of how to address institutional racism and offered specific recommendations for ABA providers to combat racial bias. Sevon (2022) also proposed similar recommendations on increasing awareness on anti-Black racism. An important step the field should take is to diligently listen to the voice from the community, consumers, and stakeholders and act accordingly to design and implement the behavior-changing system to dismantle these issues. Such endeavor can be strengthened by using within-subject research designs. For example, as an extension to Čolić et al., researchers might design and implement an intervention package among service providers consisting of awareness training on Black cultural values and intersectionality between Blackness and autism. They could subsequently incorporate behavior skill training on strengthening partnerships among stakeholders. A study can be conducted by first gathering qualitative and quantitative data on Black caregiver experience within behavior analytic settings. After the implementation of the intervention package among service providers, multiple waves of follow-up measures can be taken. Using within-subject group designs, statistical analysis can be done to detect whether the intervention package produced measurable improvements on Black caregivers' experience. Surely a single-subject approach could also be crafted here, however external validity is inherently reduced.

*Predictors for Outcome*

Another area where within-subject group design can be used is to identify predictors for certain outcome measures. Consider the following scenario: A behavior analyst who works at a local school district is interested in exploring whether there is a relationship between the amount of ABA service received and students' progress. In order to advocate for more resources devoted to ABA, the education team needs to reasonably demonstrate a relationship between the dosage of ABA and the amount of progress. In this situation, SSDs cannot easily answer this question. The outcome of ABA is often measured across multiple weeks or months. With alternating treatment designs, the short exposure to each dosage condition is not powerful enough to produce meaningful changes that can be detected. With reversal designs across multiple dosage levels, the potential confound of sequence effect and carryover effect is so large that it is very difficult to attribute measured gains to a specific condition. An alternative is to visually inspect a scatterplot with the treatment dosage on the x-axis and the amount of progress on the y-axis. However, when the number of learners is low and with high variability in outcome measures, it might be difficult to visually interpret the trend of the progress as the dosage increases along the x-axis.

A within-subject group design would be a good fit in this situation. Instead of relying on SSDs or visual analysis of the scatterplot, a linear regression analysis can be done to identify whether the dependent variable can be reliably predicted by a single or

multiple independent variables. For example, Yi et al. (2022) was interested in identifying factors that could predict participants' gain in school readiness skills. Using a cohort of 17 autistic students within a public school, the researcher conducted a simple linear regression on the dosage of PEAK-based instruction on participants' gain in Bracken School Readiness Scale (BSRA; Bracken, 2007). Results showed that the amount of PEAK-based instruction was a statistically significant predictor for their gain on BSRA, $F(1,14) = 5.31$, $p = .036$. The dosage of PEAK-based instruction accounted for 27.80% of the variance observed in BSRA gain.

Studies and analyses like this can deepen our understanding among several issues regarding the training for the next generation of behavior analysts and ensuring high quality of care. Several recent studies analyzed data released by the Behavior Analyst Certification Board (BACB) on certification outcomes among accredited and verified course sequences in this field (Dubuque & Kazemi, 2022; Matson & Konst, 2014). By comparing certification outcomes among multiple applicant characteristics (e.g., program mode and accreditation status), researchers reported trends in the number of applicants in the last decade and differences observed among applicants experienced different modes of learning (e.g., in person, remote, hybrid). An extension of this body of work would be to use within-subject group designs and to use analyses such as linear and logistic regression models in identifying the environmental factors that are mostly likely to impact the educational outcome. Researchers need to first gather more comprehensive applicant data, such as demographic information, social economic status, educational information (e.g., program mode, curriculum design, faculty-student ratio), fieldwork and supervision experience, and continue education. Researchers also need to collect more comprehensive outcome measures besides the board exam pass rate, such as consumer satisfaction, and apply appropriate statistical tests to identify predictors of these outcome variables. Similarly, the field has become increasing aware of staff burnout and its detrimental impact on the quality of care (Plantiveau et al., 2018). By using similar group design method, researchers can identify predictors of staff burnout and develop corresponding strategies to improve the quality of care.

*Psychometric Properties*

Behavior analysts have a long history in designing measurement systems for behavior changes overtime. Focusing on the individual's learning history, the field has long cautioned against standardized testing due to concerns on the inability to individualize the assessment's process, which might more accurately reflect on the behavior observed (Ayllon & Kelly, 1972; Koegel et al., 1997). As the field continues to evolve and expand, concerns have been raised on the reliability of many assessments ABA providers use in clinical settings. The field of psychometrics studies the construction and application of assessment tools and an assessment's psychometric properties describe how well it measures what it claims to measure. Most commonly, researchers evaluate the instrument's validity and reliability, and, often time for a newly developed instrument, the extent to which the instrument yields similar outcome to established measures (Nunnally & Bernstein, 1994). In a systematic review conducted by Ackley et al. (2019), only four of the 18 ABA-based assessments reported data supporting its reliability. Evaluating psychometric properties of ABA-based assessment is not only a valid scientific objective, but also offers many benefits such as increasing the external validity of the field, simplifying assessment process, and increasing dissemination beyond behavior-analytic journals (Sutton et al., 2022). Issues like this cannot be answered by SSD, and within-subject designs can be useful in studying the psychometric properties of the instrument. For example, Sutton et al. (2022) evaluated the convergent validity and internal consistency of the PEAK Comprehensive Assessment. Lenoir et al. (2022) evaluated the convergent and age appropriateness of the Children's Psychological Flexibility Questionnaire.

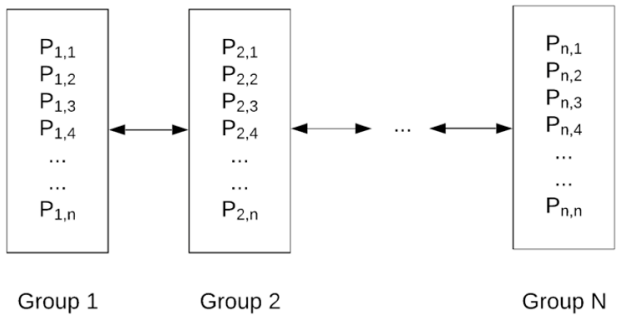
Research studying psychometric properties is critically important to our field. An inaccurate or skewed measurement system is likely to render whatever conclusions made based on the observation or whatever progress captures via data collection invalid. This need is further amplified as the field keeps expressing interests on social issues, such as cultural humility and cultural responsiveness (Kolb et al., 2022; Wright, 2019). The behavior being measured can no longer be limited to simple operant classes. When a measurement system is developed and used to capture a group of behavior constituting a dynamic behavior system, the lack of psychometric studies on these instruments is concerning. Luckily, researchers are beginning to pay more attention during the development process and often seek to obtain feedback to revise their early draft. For example, Gatzunis et al. (2022) developed a Culturally Responsive Supervision Self-Assessment (CRSS) tool for supervisors to self-reflect on their cultural responsiveness during supervisions. Gatzunis et al. gathered feedback on CRSS and collected social validity data for its final form. An extension of their work would involve rigorous psychometric analysis of CRSS. Using within-subject group designs, researchers can extend this work by collecting responses among a large number of supervisors. CRSS's three domains can be verified by calculating the internal consistency among all items within the same domain. Furthermore, factor analysis can be used to examine whether the construct of the instrument correspond

to its theoretical underpinning, with the rationale being that items measuring the same domain should converge while items from different domains should be relatively independent. Test-retest reliability can be examined by administering the CRSS twice with one same group of participants and calculating the correlation between the two outcomes. Convergent validity can be examined by comparing the outcome of CRSS with established measures. Content validity can be examined by synthesizing the input from a group of subject matter experts. And most importantly, researchers can compare whether the self-reported CRSS outcome corresponds to perceptions from the supervisee.

*Between-Subject Group Design*

In contrast to within-subject group designs, between-subject group designs compare dependent variables collected between two or more groups of participants. Participants are usually categorized into multiple groups based on conditions and demographic characteristics, or are intentionally assigned to different groups which, later on, are exposed to different conditions (e.g., treatment options, waitlists). Here, the analysis primarily focuses on detecting the differences between the groups, which in turn, speaks to the impact independent variables have on dependent variables. Researchers can answer questions such as whether an added component of ACT can increase parental adherence to an online ABA caregiver training program (Yi & Dixon, 2021), comparing the efficacy of relational training procedures on intelligence (May & St. Cyr, 2021), and whether autistic individuals perform differently during skill assessments compared with neurotypical peers (Dixon et al., 2017). Most commonly, these questions are answered using independent sample T-tests or analysis of variance (ANOVA), depending on the number of groups. Figure 2 illustrates the comparison being made in this scenario.

**Figure 2.**
*Illustration for using between-subject group design to compare differences among multiple groups.*




Compared with within-subject group designs, between-subject group designs have several methodological advantages and challenges. In a between-subject group design, one major concern is the inherited differences between the two groups. Suppose the researcher wants to compare two types of ABA intervention on participants skill gain across six months. Had two groups not being equal at the baseline condition, one can make the argument that any observed differences in skill gain might be attributed to the differing foundational learning skills between the two groups, rather than the different intervention. In within-subject group designs, differences among participants are less of a concern as participants are each compared against themselves, thus controlling for this difference. Another disadvantage for between-subject group designs is the requirement of the sample size. A between-subject group design using two groups of participants effectively double the number of participants required. This also leads to its potential insensitivity in detecting the treatment effect. More variability is inherently introduced with a larger number of participants. This variability often leads to smaller power in the statistical method used, decreasing its ability in detecting smaller changes. In other words, with all things being equal, studies using between-subject group designs need to produce a larger effect to avoid type-II errors.

At the same time, between-subject groups design also offer many methodological advantages. It is generally more flexible than within-subject group designs in the statistical methods used (Keppel, 1982), and can avoid sequence effects, which could be detrimental in certain within-subject design studies. When evaluating the differences across multiple treatment conditions using a within-subject research design, the order in which these conditions are exposed to participants might have a significant impact on the dependent variable. At the same time, a previously exposed condition might have carryover effects on the latter condition. This concern is similar to that of reversal designs used in SSDs. When using between-subject group designs, however, sequence effect is less of a concern since each group is independently exposed to its own condition.

*Comparing Treatment Outcomes*

A common application of between-subject group designs in behavior analytic settings is to compare outcomes of multiple treatment options. This is arguably one of the most important applied questions the field needs to answer: what works and what works better. Although SSDs such as alternating treatment designs and component analysis provide powerful demonstration on the impact of behavior-change procedures with an individual, and allows a direct comparison between different treatment conditions, aggregating such findings at a group level would better address the question on what is likely to work

when similar intervention is applied to a larger group of individuals.

For example Dixon et al. (2021) evaluated the impact of relational training procedures on participants' intelligence. The researcher randomly assigned a group of 17 autistic participants into two groups: a comprehensive ABA (C-ABA) group involving relational training procedures and a traditional ABA (T-ABA) group receiving instructions based on contingency-based learning and generalization, but not content that incorporated derived relational responding. In addition, 11 participants currently on the waiting list for ABA services served as a convenient waitlist control group. All participants' IQ was measured at baseline and after 12 weeks of intervention. A one-way ANOVA was conducted to compare the differences in participant's IQ change score. Results showed a statistically significant difference in participant's IQ change score among the three groups, $F(2,26) = 5.80$, $p = .008$. Post-hoc analysis indicated a statistically significant difference between participants in the C-ABA group and T-ABA group ($p = .042$), and participants in the C-ABA group and the waitlist control ($p = .009$). No statistically significant difference was detected between participants in the T-ABA group and those in the waitlist control ($p = .841$).

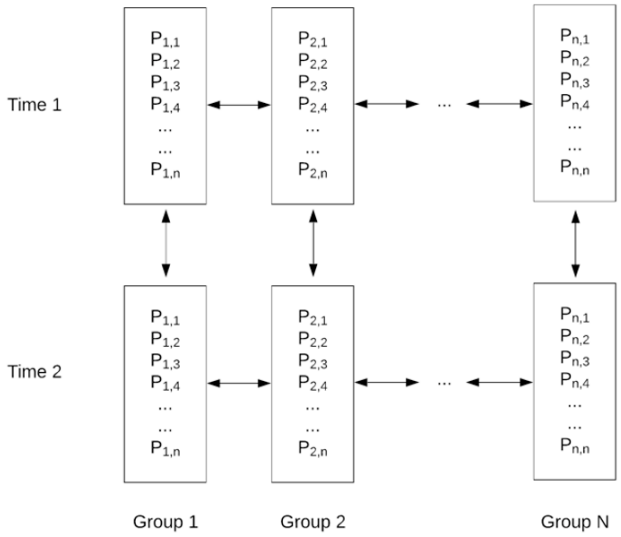
Studies like this using between-subject group designs are extremely important as functional utility is at the very core for a pragmatic behaviorist: questions concerning what works and what does not work to produce behavior change. With new intervention approaches and competing treatment options being developed daily, partitioners are ultimately tasked with providing the most appropriate and effective care. To answer the "what works" question requires using between-subject group designs. For example, there has been ongoing debate on optimal parameters of error correction and prompting strategies in discrete trial training. Yet often time, research remained at the individual level, with different studies reporting different outcomes. This speaks to the issue mentioned above, as it is difficult to synthesize outcomes from multiple or even a single study SSD with participants showing varying outcomes. An alternative would be to randomly assign participants into multiple groups, with each group exposed to one study condition. For example, participants in Group A will always receive errorless teaching procedures while participants in Group B will always receive least-to-most prompting. Researchers can then compare outcome measures between the two groups, such as trial to criteria, number of targets mastered, and social validity data. Often time, such analyses can be strengthened by introducing within-participants variables and this research design is called mixed group design.

*Mixed Group Designs*

Mixed group designs usually involve analyses that are conducted both at the within-subject level and at the between-subject level. They are often used in longitudinal studies involving multiple treatment conditions. Here participants are compared against their peers with different group assignments and against themselves across different timepoints. A wide range of statistical models can be used to detect the effect of group assignment and time, as well as to explore the interaction effect of the two independent variables. General linear models and mixed-ANOVA are often used in studies using group designs. Figure 3 illustrates the comparison being made in this scenario.

**Figure 3.**

*Illustration for using a 2 (Time 1 VS Time 2) x N (Group 1 VS Group 2 VS ... VS Group N) mixed group design to compare differences among multiple groups at both timepoints.*




*Randomized Controlled Trials*

Among the few studies in the field of behavior analysis that utilize mixed group designs, the majority of them fall under the category of randomized controlled trials (RCTs). RCTs are widely accepted as a good standard in conducting casual analysis on the treatment's outcome with agreed upon procedural safeguards in maintain its internal and external validity (e.g., the CONSORT Statement; Schulz et al., 2010). In an RCT, eligible participants are randomly assigned into multiple groups of conditions with dependent measures captured throughout the study at various timepoints. During the analysis, researchers analyze the trajectory of dependent variables within each group, as well as comparing them among all groups at various timepoints.

For example, Sanders et al. (2020) conducted a RCT evaluating the impact of a rapid ABA assessment and treatment protocol among hospitalized autistic

children. Sanders et al. randomly assigned 36 eligible participants into two conditions. Those in the treatment group received a latency-based functional analysis and corresponding function-based behavior reduction plan. Those in the control condition received no active behavioral intervention. Participants clinical functioning, length of hospitalization, and perception from the medical team were evaluated before and after discharge. Results showed preliminary support of incorporating ABA procedures in in-patient hospital settings as those assigned to the treatment group demonstrating more improvements at a statistically significant level. In another example, a re-analysis of the Dixon et al. (2021) study was conducted using mixed-ANOVA to explore the potential interaction effect between group assignments (C-ABA VS T-ABA VS waitlist) and time (baseline BS follow-up; Yi et al., 2021). Results showed a statistically significant main effect of time and a statistically significant interaction effect. RCTs can be one of the most powerful tools for applied researchers, especially in addressing concerns on ABA's overall effectiveness (United States of America Department of Defense, 2021). A longitudinal RCT with multiple waves of data tracking participants overall development will provide strong evidence on the intervention's effectiveness or the lack of.

## Conclusions

The exponential rise in the number of behavior analytic professionals signals an extremely bright future for the field of behavior analysis. The growth of the discipline alone is a metric of utility that our science has on saving the world around us (Dixon et al 2018). The time is ripe to couple this rise in popularity of the discipline with a rise of impact and verification that yes indeed – this field matters. We believe that a slight pivot from the reliance of SSDs to a greater adoption of group design methodology could produce great influences for our field to be taken seriously by outsiders. Training programs in behavior analysis should broaden their coursework in research designs to include some of methods noted here within. Clinicians should begin to more carefully examine how to optimize a blend of routine care with research techniques such as regression models, wait-list controls, and environmental comparison studies. Activists within the field wishing to champion a cause, should come forward with data – as such will more quickly alter cure idle hands and silent majorities. Our field has been defined as an enterprise deeply entrenched in pragmatic utilitarianism. Therefore, it is time to make peace with the pragmatic gains that can be accomplished via the occasional adoption of group designs into the field of behavior analysis at a more robust level than historically has occurred.

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# Supervision Strategies for Treatment Fidelity and Job Satisfaction in Applied Behavior Analysis Services

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## Abstract

Supervising behavior technicians in the implementation of services derived from the science of applied behavior analysis with children diagnosed with autism spectrum disorder (ASD) is a common practice for behavior analysts. However, there is limited training available on supervision strategies for those applying this model of services. Lack of training can lead to ineffective and inconsistent supervisory practices, resulting in low rates of job satisfaction for supervisees and variable fidelity in treatment implementation. The quality of supervision can improve job satisfaction and treatment fidelity. This study was conducted using a nonconcurrent multiple baseline design across participants to evaluate the effects of an evidence-based approached to supervision on treatment fidelity and job satisfactory for three behavior technicians providing services for a child with ASD. Each of the three technicians demonstrated improved levels of treatment fidelity and increased job satisfaction across several facets of their job during the intervention and maintenance phase. Implications of these findings, limitations of this study, and suggestions for future research are included.

**Keywords:**

Supervision, Job Satisfaction, Applied Behavior Analysis, Behavior Technician, Treatment Fidelity

## Introduction

Oftentimes behavioral treatment derived from applied behavior analysis (ABA) is delivered in a tiered model (Council of Autism Service Providers [CASP], 2020). This tiered model typically consists of a behavior analyst who is licensed (Association of Professional Behavior Analysts [APBA], 2022) and/or board certified (Behavior Analyst Certification Board [BACB], 2022), supervising the direct services of a behavior technician. In this model, the supervising behavior analyst is expected to provide the technician with training on treatment protocols specific to those receiving the services as well as ongoing supervision to ensure treatment recommendations are delivered with fidelity. For individuals receiving ABA-based services, a customized treatment plan is developed by the supervising behavior analyst to include skill acquisition as well as a behavior increase and reduction protocol when appropriate. The technicians are expected to implement the detailed protocol as outlined in

each treatment plan to assist the individual receiving treatment in achieving their individualized goals. The protocols include, but are not limited to, conducting teaching procedures, recording accurate data on client behaviors, delivering prompting strategies as outlined, and using potent reinforcers effectively (Cooper et al., 2019).

Within the field of ABA there are high rates of technician turnover (Sundberg, 2016). Turnover can inadvertently effect treatment fidelity as well as the progress consumers make (Mandell et al., 2013; Wine et al., 2020). Retaining trained technicians is a priority because of the specialized training and oversight invested by the supervising behavior analyst when working with individuals with autism spectrum disorder (ASD), not only for the employer funding the training but also for those receiving the ABA-based treatment.

Job satisfaction and intention to leave have been linked to the quality of supervision received (e.g., training received, communication, recognition received by the supervisor) and level of competency to do the job (Kazemi et al., 2015; Wilson, 2015). In traditional work environments a supervisor commonly refers to the person whom the employee reports and may complete employment reviews and determine promotions. In ABA-based services, the term supervisor is most often used to refer to the supervisor of a trainee (i.e., individual accruing fieldwork experience and seeking certification) or that of a supervisee (i.e., individual implementing behavioral services [BACB, 2020]). For the purposes of this paper, the term clinical supervision/supervisor will be used for the supervision of a supervisee delivering ABA-based services for an individual.

In the tiered model of services found in ABA, the clinical supervisor will often have the most direct and frequent exposure to the technician. There is a tremendous investment required of the clinical supervisor in training behavior technicians on their teams; each program is personalized for the individual receiving treatment, requiring specific training on protocols and ongoing oversight provided to a behavior technician by a Board Certified Behavior Analyst (BCBA; BACB, 2014; Odom et al., 2010; Volkmar et al., 2014). Having a tool that supports job satisfaction and retention of trained behavior technicians who can implement protocols with fidelity would provide meaningful change for organizations that offer ABA-based services for individuals with autism.

Employees who are provided with quality supervision and training are more satisfied with their job (Collins et al., 2008; Eisenberger et al., 2002; Mor Barak et al., 2009; Parsons et al., 2003; Reid et al., 2011). Studies show that there is a relationship between the satisfaction level of an employee and employee turnover (Kuo et al., 2014; Sageer et al., 2012). Research has indicated that improved treatment implementation can be achieved by providing specific goals, training to mastery, and giving direct feedback to implementers (DiGennaro-Reed et al., 2011; Miles & Wilder, 2009; Parsons et al., 2012; Sarokoff & Sturmey, 2004) and that job satisfaction can be improved as competency is built (Wilson, 2015).

*Importance of Treatment Fidelity*

A substantial challenge to intervention is behavioral drift on the part of the implementor in the application of intervention, resulting in protocols being implemented incorrectly or not to fidelity (Allen & Warzak, 2000). Even when the most effective procedure is being recommended by a clinical supervisor, if that intervention is not being implemented to fidelity it could be compared to an individual taking half of their prescribed medication (Miller & Rollnick, 2014). The importance of measuring treatment fidelity was illustrated by Rodriguez et al. (2009) whose findings showed a decrease in problem behavior for three children enrolled in school programs when their teachers scored higher on treatment fidelity measures. Teachers with lower fidelity scores showed minimal decrease in problem behavior. Although more research is needed on the effects of treatment fidelity, high quality implementation can impact results of an intervention (Thijssen et al., 2017). Many times, a behavior technician that has not mastered a skill can practice mistakes leading to problems with treatment outcomes (DiGennaro-Reed et al., 2011).

A key component of ABA-based services is delivering prompts and reinforcement at the rate defined by the clinical supervisor. The timing of delivery is important because the implementer risks missing an opportunity to prompt or reinforce the behavior of interest, inadvertently reinforcing undesirable behaviors (Cooper et al., 2019; Mayer et al., 2012). For example, when considering the target behavior of a child vocally stating the word bird at the presentation of the image of a bird on a picture card, the behavior technician will present the card and should provide a short delay (i.e., 2-3 s) to allow a response. If the child responds within the specified time with the vocal utterance bird, a prescribed reinforcer is delivered; if there is no utterance, a prescribed prompt can be delivered. If, in this example, the technician waits 10 s for a response and during the 10 s delay the child looks at their mother and then says the vocal utterance bird, receiving reinforcement for that vocal utterance, the behavior technician may have reinforced labeling the client's mother with the vocal utterance bird. In this example, latency in the delivery of reinforcement is critical to the fidelity of the intervention.

*Importance of Job Satisfaction*

Interventions derived from the science of ABA have been highly successful in helping to improve the developmental delays of children with ASD and studies show evidence of the significant benefits for improving quality of life (Ben-Itzchak & Zachor, 2007; Eldevik et al., 2012; Leaf et al., 2011; Lovaas, 1987; Rogers & Vismara, 2008). However, Grindle et al. (2009) discussed the limited research on parents' perceptions of the effects of ABA-based services for their children. Grindle et al. explored parent perceptions by interviewing parents (i.e., 32 mothers and 21 fathers) who received 2 years of ABA-based services about their experience in home-based services. Grindle et al. presented findings indicating most parents recognized the benefits of 2 years of ABA-based services for their child and their child achieved growth in developing new skills and reduced challenging behaviors.

Grindle et al. (2009) went further to offer a summary of frequently occurring concerns shared by parents. Difficulties with direct support staff were expressed by 91% of mothers and 100% of fathers. The difficulties included challenges with recruiting new therapists and high turnover rates, causing disruption to their program. Parents felt that the challenges related to recruitment and retention slowed progress for their child. In addition, parents of children receiving ABA-based services feel that maintaining a strong rapport with their intervention team allows for more successful outcomes (Grindle et al., 2009). Leach (2005) surmised that well-established positive rapport has a direct effect on outcomes of treatment. When a behavior technician with whom a family has a strong bond resigns, the family's trust could weaken for the entire organizations and its ABA-based program.

The behavior technician's role is oftentimes entry level; this means that many behavior technicians have little to no experience or training prior to starting in their first position. Although offering treatment in a tiered model helps to keep costs low for those funding treatments, it places a heavy burden on the employer to train those individuals (Wood et al., 2007). It is important to consider that the population receiving services can be vulnerable and requires skilled and carefully planned treatment implementation and oversight by the supervising behavior analyst.

Any level of turnover results in high costs for organizations. Sundberg (2016) asserted that the average cost of turnover for a behavior technician to the organization can be as high as $5,000 per person. In addition to the expected costs associated with turnover, such as advertising fees, recruitment, and orientation (Abbasi & Hollman, 2000), there are also hidden costs such as decreased morale, decreased consumer relations, and damaged organizational reputation. When a behavior technician resigns, there are direct consequences to the consumers, sometimes resulting in the decision to terminate services, submit complaints or find another provider to work with. Employees who are satisfied are more loyal (Sageer et al., 2012) and more likely to be retained.

Collins et al. (2008) found that employee retention is a catalyst to consumer satisfaction and relations. These findings are supportive of Geyer's (2005) argument that there is a need for improved training, through evidence-based supervisory interventions, to improve employee satisfaction. Collins et al.'s (2008) results showed that more satisfied employees do a better job and make their patients happier. Businesses should focus on preserving highly trained employees that they have within their organization by enhancing job satisfaction through the supervision and training programs offered to employees (Abbasi & Hollman, 2000).

Ganster et al. (2011) stated, "How individuals are rewarded at work is perhaps one of the most salient features of the work environment and can serve as a source of satisfaction, challenge and fulfillment or a source of uncertainty, mistrust and perceived inequity" (p. 224). It is essential that a model of reinforcement and reward be incorporated into supervision as part of maintaining satisfaction and staff retention for ABA-based service providers if those are desired behaviors to increase.

*Connecting Supervision, Job Satisfaction, and Treatment Fidelity*

Job satisfaction is a vital aspect of consideration for supervisors (Kazemi et al, 2015; Reid et al., 2021). The measurement of job satisfaction for human service providers directly correlates to employee effort, interactions with consumers, and even absenteeism (Reid et al., 2021). There are many factors that can contribute to employee satisfaction and retention, but a key controllable variable is the supervisor's efforts towards fostering a motivating work environment. Regrettably, opportunities for supervisors to provide immediate reinforcement (e.g., praise, support, training) to behavior technicians is commonly limited to supervision sessions. Additionally, many behavior analysts are not trained or fluent in supervisory practices and consequently those practices can be applied inconsistently. As such, behavior technicians may leave their position because of lack of supervisor-directed reinforcement, lack of effective training on interventions, or lack of motivation to keep them in their role.

Guidelines for effective supervision strategies are emerging (e.g., BACB, 2018; Reid et al., 2011; Sellers et al., 2016; Turner et al., 2016). When a supervisor does not have a structured model, there is room for variability and possibly inadequate supervision that could lead

to dissatisfied employees (Green et al., 2002). When an employee feels valued by the supervisor, there is a decrease in rates of turnover (Eisenberger et al., 2002). A positive relationship between employees and their supervisors is a strong indicator of employee productivity and retention (Kuvaas & Dysvik, 2010). As previously discussed, behavior analysts who are supervising the direct services of technicians are required to provide hands-on training of interventions. Kazemi et al. (2015) examined turnover of technician-level interventionists working with individuals with ASD through an extensive survey. Kazemi et al. evaluated several aspects of turnover in ABA-based services and found that 38% of the 96 respondents were likely to leave their position because they were not satisfied with their supervision, training, and pay. Notably, Kazemi et al. expressed that pay level was not indicative of satisfaction, meaning the amount the technician was paid varied and satisfaction with the amount was subjective.

Simply providing generic supervision to technicians is not enough to ensure they are supported and equipped to not only perform, but also to sustain their role. The BACB (2018) recently released an updated supervision curriculum. This is a great step and provides necessary guidance; however, there continues to be a need to build access to trainings and improve supervisory practices. To improve behavior technicians training, Reid et al. (2017) suggested that clinical supervisors not only supervise the direct services of assigned clients, but also have a collaborative approach with all aspects of the behavior technician's employment from the start of hire. Furthermore, Gibson et al. (2009) surmised that perceived supervisor support was connected to technicians strong or weak feelings of accomplishment and emotional exhaustion. When a technician perceives they are supported by the supervisor, there is less emotional exhaustion and a greater feeling of achievement in their work. The supervising behavior analysts must not only focus their time on the case supervision (i.e., ensuring programing is individualized and appropriate for the consumer), but also the relationship they have with their supervisees. It is a difficult challenge for behavior analysts, especially when considering all the duties involved in their role. Achieving treatment fidelity can be a challenge; therefore, strategies to ensure that there be consistent supervision that incorporate opportunities to evaluate and maintain skills are essential (Carr et al., 2013).

The findings in the literature suggest that supervisory methods are linked to improved treatment fidelity and job satisfaction. Essentially when an employee is doing a good job, they are happier at that job. When employees are provided with quality supervision, they are more loyal, less likely to quit, more productive in their work, and are better service providers. Moreover, job satisfaction and retention lead to consumer satisfaction and lower turnover costs for the employing organization. Much of the research in employee satisfaction and retention has mainly been derived by employee and supervisor reports via survey, such as that used by Collins et al. (2008). The purpose of the present study was to evaluate the effects of the Supervisor Training Curriculum: Evidence-Based Ways to Promote Work Quality and Enjoyment Among Support Staff (Reid et al., 2011) when applied to clinical supervision with behavior technicians as it relates to treatment fidelity and job satisfaction. The supervision training used was interpreted as an intervention package that included modifying the level, quality, and expectations related to the performance of a clinical supervisor who provided oversight to three behavior technicians.

## Method

### *Participants*

Three behavior technicians participated in this study. All potential candidates volunteering to participate must had worked at the research site for a minimum of 6 months to be eligible. Participants were offered an opportunity to volunteer and were selected at random by an administrative assistant. Any behavior technicians who volunteered but were not assigned to shared cases with the selected a selected clinical supervisor were excluded from participation. This exclusionary criterion was established because the study required that the clinical supervisor who was selected to implement the intervention have prior supervisory experience with the technician and the analyst and technicians had a shared case assignment at the time of the study. The three technicians were selected at random from those who volunteered and were not excluded. Participants were all females with an age range of 27-52 years, were employed at the site for a range of 8 months to 11 years, two participants identified as white, and one participant identified as black. Educational backgrounds varied, with participants holding bachelor level degrees in psychology and social work, and a master's degree in behavior analysis. Each technician was trained in the implementation of protocols written by a behavior analyst and using prompting and reinforcement delivery systems. Each technician met minimum competencies as required of their job, requiring a minimum score of 80% before beginning direct service with clients. The competency checklist was composed of 17 subject areas that required formal training related to the role of a behavior technician.

### *Setting*

This study was conducted at an agency in the Northeast providing home, school, and clinic-based intervention for individuals between birth and 21

years of age. The intervention was conducted with three behavior technicians delivering ABA services for a child diagnosed with ASD, aged 2.5 years, in the child's home setting under the clinical supervision of a certified behavior analyst.

*Dependent Variables*

One variable evaluated was treatment fidelity, the measure in which the behavior technicians implemented protocols as designed. For the purposes of this study, specific components of the treatment protocol were identified as the targets. The identified targets were the latency between the delivering a discriminative stimulus and the delivery of a prompt, the latency between the delivery of reinforcement between the prompted or independent behavior, and missed opportunities to deliver a prompt or reinforcement.

Another variable that was evaluated during the study was job satisfaction. This study used the Job Descriptive Index-Job in General ([JDI-JIG] Bowling Green State University, 2009) to measure the level of job satisfaction the behavior technicians had before and after the intervention. The JDI-JIG requires the employees to consider specific components of their job as well as their job in general and rate their level of satisfaction across each. The JDI-JIG components evaluated by the participants in this study were their level of satisfaction in their (a) work on present job, (b) pay, (c) opportunities for promotion, (d) supervision, (e) people on present job, and (f) job in general. For the section related to work on present job and supervision, the technicians were asked to think specifically about case that they were to be illustrating in the study and the supervision they are receiving from the assigned clinical supervisor on that case. All other responses related to pay, opportunities for promotion, people on present job, and job in general were to be reflection on their attitude in each area across all aspects of their job. This served not only as a tool for measuring job satisfaction, but also as a social validity measure of the intervention itself.

*Data Collection*

For the three phases in this study (i.e., baseline, intervention, and maintenance), trained observers recorded video samples of the latency of delivering prompts and reinforcement by the technicians across multiple. Data were recorded using a paper data sheet and the time stamp located on each video sample. The use of video samples allowed the observer to pause and rewind to increase the likelihood of accuracy in the data. The data sheet was designed to allow the observer to document the recorded latency or an absence of delivering a prompt or reinforcement by the technician. Delivering prompts was defined as the technician providing the client with one of the following teaching prompts during a teaching trial: full or partial physical prompt, full or partial verbal prompt, gestural or a model prompt.

Delivering reinforcement was defined as the technician delivering an item to the client that had been established as reinforcing through a preference assessment conducted at the onset of each session. Latency was defined as the amount of time recorded between the delivery of a discriminative stimulus by the technician and the delivery of a prompt or a reinforcer. During each video sample, there were several opportunities to deliver reinforcement or prompts. Each trial conducted by the technician offered an opportunity for delivery of prompts or reinforcement; an absence of delivering either was recorded as such.

During the baseline and maintenance phase of the study, the JDI-JIG was used to provide a measure of job satisfaction in numerical form with a top score of 54 for each facet. The percentage of job satisfaction was determined by measuring the actual score and dividing it by the total possible score to provide a percentage that was applied as level of job satisfaction for the specified facet across two phases of the intervention. The scores indicated the level of job satisfaction the participant had prior to receiving the intervention (i.e., during baseline) and after receiving the intervention (i.e., during maintenance).

*General Procedures*

The clinical supervisor completed 14 hr of group training across two days and was required to display mastery for each module. Attendees to the training received an individual trainee guide and handouts to keep as reference tools. All trainees attending were required to engage in role-play activities and be active in discussions related to each of the 11 modules. To confirm the attendees were able to correctly implement the evidence-based methods in the supervision intervention package, there was a required on-the-job competency assessment that evaluated generalization. A generalization competency assessment was used to evaluate the clinical supervisor implementing all relevant strategies with a supervisee in the natural setting, requiring a minimum of 90% accuracy to meet competency.

A nonconcurrent multiple baseline design across subjects was used to measure the effectiveness of the supervisor training intervention (Reid et al., 2011) on the behavior technicians' treatment fidelity. There were three phases (i.e., baseline, intervention, and maintenance) in this study across three participants. During the baseline phase, a measure of current performance was recorded for each participant prior to receiving the intervention. The intervention phase was staggered across all three participants to ensure

that the onset of the intervention phase occurred across different times. The maintenance phase began for participants once it was determined that mastery was achieved. During the maintenance phase, the clinical supervisor discontinued providing supervision for the established protocol, and fidelity continued for a minimum of four sessions across several weeks. The supervising behavior analyst provided a job duties checklist detailing expectations and reviewed progress and errors using diagnostic performance feedback during supervision sessions as well as formal and informal performance monitoring. The supervisor continued to train using the strategies outlined in the supervision training package until the technicians were accurately implementing the protocol as designed.

*Baseline*

During baseline, video samples were recorded of the behavior technician implementing a protocol designed to teach gross motor imitation skills and a protocol designed to teach matching skills with their client. The client and protocols were the same across all three participants. Both protocols called for a continuous schedule of reinforcement for all prompted and independent behaviors. The behavior technicians were expected to avoid missed opportunities and to prompt and reinforce responses. The video samples were reviewed, and a baseline measure was determined for each participant prior to the onset of the intervention measuring the latency between the delivery of a discriminative stimulus and the delivery of a reinforcer or the latency of the delivery of the prompt and reinforcer. The latency of the delivery of prompting and reinforcement was determined as the time in which it took for the technician to deliver the choice response (i.e., prompt or reinforcement) during a teaching procedure. Missed opportunities for the delivery of prompts or reinforcement were also measured using frequency of occurrence per video sample. During each session, a video sample was recorded to allow for more accurate measurement, opportunities to attain interobserver agreement, and were used during the feedback sessions in which the supervising behavior analyst was not present at the live session.

During the baseline phase, each participant was required to complete a survey that measured their level of job satisfaction, the JDI-JIG. The survey results were not shared with the supervising behavior analyst, and results did not have any bearing on the employment status of the participant. The purpose was to establish a baseline level of job satisfaction prior to the intervention and to measure job satisfaction again post intervention to compare results and evaluate any changes.

*Intervention*

The intervention phase was staggered across all three participants. Although the researcher preferred to have a minimum of three points of reference prior to termination of a baseline phase, it was determined by the supervising behavior analyst to begin intervention or Participant 1 after only having two data points for reference in baseline. Participant 1 was scheduled to implement sessions with the client a frequency of one time per week, whereas other participants had several sessions scheduled per week with the same client. The limited frequency that Participant 1 had sessions with the client was a potential challenge, as it was important to the behavior analysts that the protocol be implemented to fidelity as soon as possible. During baseline, behavior challenges were identified, and it was hypothesized that they could have been related to the lack of fidelity with the targets being measured. It was determined that, for the well-being of the client, Participant 1 begin the intervention phase no later than by the third session.

The latency of the choice response (i.e., prompt or reinforcement) and missed opportunities for delivering prompts and reinforcement during video sample was recorded in the same way they were recorded at baseline. During the intervention phase, the supervising behavior analyst began by providing each technician with a job duties checklist that detailed expectations of the delivery of prompts and reinforcement, reviewed the job duties checklist, provided modeling of the expectation, observed implementation, and provided diagnostic performance feedback during direct supervision sessions (Reid et al., 2011).

Diagnostic feedback included the written and verbal description of expectations on delivering prompts or reinforcement with immediacy and as designed. The clinical supervisor modeled the expected behaviors by implementing the protocols (i.e., gross motor imitation and matching using discrete trial training) and delivering reinforcement within the required 1-3 s or prompts within the required 2-5 s during sessions with zero missed opportunities. The technician was then observed in person and in a video sample implementing discrete trial training procedures with several opportunities for the delivery of reinforcement or prompts. The technician received ongoing feedback throughout supervision that included praise for correct action and a detailed description of incorrect action.

To ensure reliability, the same clinical supervisor provided the supervision across all three participants with the same client using the same teaching protocols. Each video sample was reviewed by two separate observers who were provided with the definition of the target behaviors. The evaluators collected data on the latency of the delivery of

prompts or reinforcement and missed opportunities for each videotaped session. The information was used to determine readiness for phase changes, behavior changes, treatment fidelity, and to attain a measure of interobserver agreement.

*Maintenance and Generalization*

To determine if the technicians maintained the skills acquired during the intervention phase, maintenance probes were conducted across a minimum of four and a maximum of nine sessions, where the technicians returned to baseline conditions and data were collected in the same manner as Phase 1 and Phase 2. Although it would have been ideal to have also included opportunities to probe generalization, the participants were unable to attain consent to collect video samples during sessions with clients other than the shared case assignment identified for the study.

*Interobserver Agreement*

To ensure reliability, data were recorded of the participants implementing procedures across numerous videotaped samples during each phase. Two trained observers viewed the video recordings and collected data on percentage of sessions. A total agreement-recording formula was used to calculate the percentage of agreement between observers (Gast, 2010). The mean percentage of agreement for latency to prompt across participants was 92% (range, 90-93%) at baseline, 97% (range, 92.4-100%) during the intervention phase, and 94% (range, 83-100%) during the maintenance phase. The mean percentage of agreement across participants for latency to reinforcement was 97% (range, 94-100%) at baseline, 97% (range, 91.2-100%) during the intervention phase, and 99% (range, 95.5-100%) during maintenance. The mean percentage of agreement across participants for missed opportunities was 98% (range, 93-100%) at baseline, and 100% agreement across both the intervention and maintenance phases.

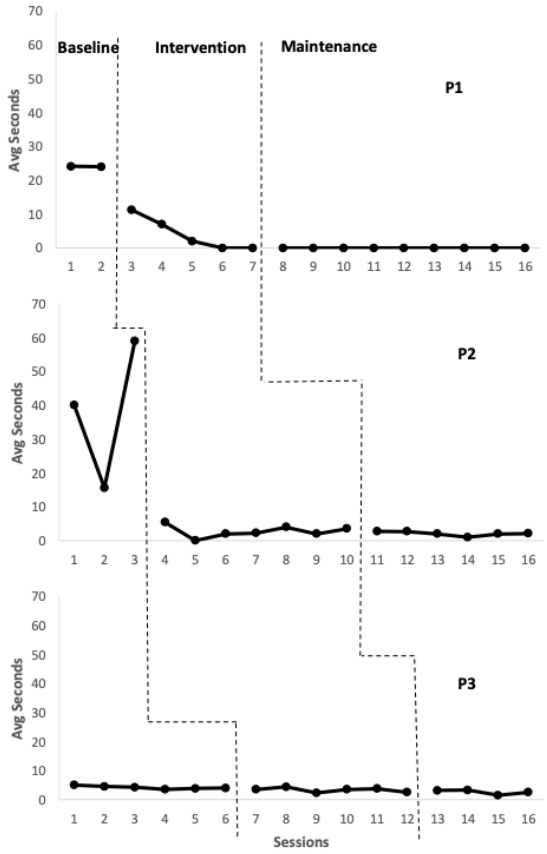
**Results**

*Data Analysis of Treatment Fidelity*

Each participant showed variability in the latency of the delivery of prompts or reinforcement at baseline. In addition, each participant showed missed opportunities beyond the expected threshold of three during baseline. Results for the latency of the delivery of prompts are presented in Figure 1. During the baseline condition, Participant 1 had an average latency of 24.07 s for the delivery of prompts, Participant 2 had an average latency of 38.02 s for the delivery of prompts, and Participant 3 had an average latency of 4.1 s for the delivery of prompts, indicating within criterion mastery at baseline.

**Figure 1**

*Latency to prompt*




Note: This graph depicts results for three behavior technicians and latency of the delivery of prompts. Data are reported as the average latency for each participant across session samples during three phases: baseline, intervention and maintenance.

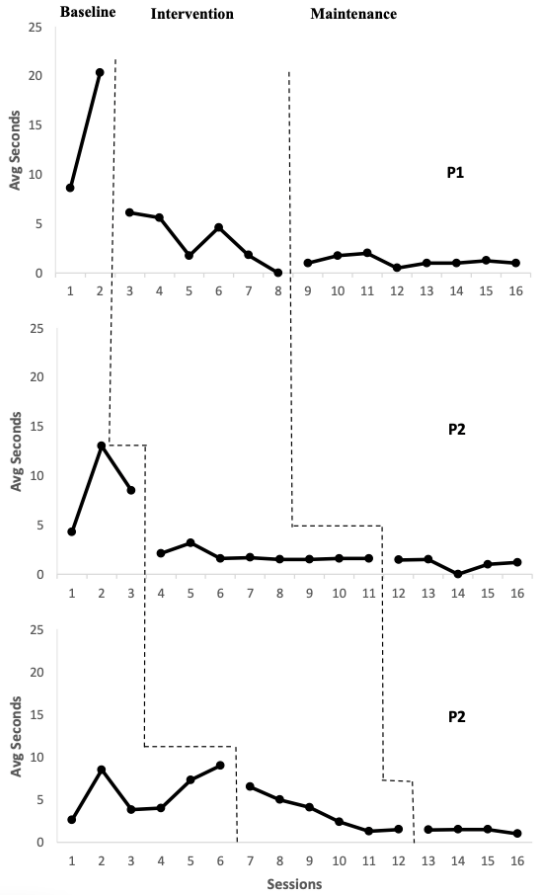
Participant 1 reached criterion for the delivery of prompts after three intervention sessions and continued to receive intervention for an additional two sessions before returning to baseline conditions at session eight; the average latency during the intervention phase for the delivery of prompts reduced to 4.05 s. Participant 2 reached criterion for the delivery of prompts after two intervention sessions and continued to receive intervention for an additional five sessions before returning to baseline conditions at session 10; the average latency during the intervention phase for the delivery of prompts reduced to 2.7 s. Participant 3 had already established achievement of mastery criterion for the delivery of prompts at baseline; however, to ensure consistency across all targets being measured, intervention was implemented for six sessions. The latency of delivery of prompts did show a slight reduction to an average of 3.3 s before returning to baseline conditions at Session 12.

Participant 1 had eight maintenance sessions over several weeks. The average latency for delivery of prompts maintained at or below the established criteria for all maintenance sessions. Participant 2 had six maintenance sessions. The average latency

for delivery of prompts maintained at or below the established criteria for all maintenance sessions. Participant 3 had four maintenance sessions. The average latency for delivery of prompts maintained at or below the established criteria for all maintenance sessions. Results for the latency of the delivery of reinforcement are presented in Figure 2. During baseline, Participant 1 had an average latency of 14.46 s for the delivery of reinforcement, Participant 2 had average latency of 8.5 s for the delivery of reinforcement, and Participant 3 had an average latency of 5.87 s for the delivery of reinforcement.

**Figure 2**

*Latency to Reinforcement*



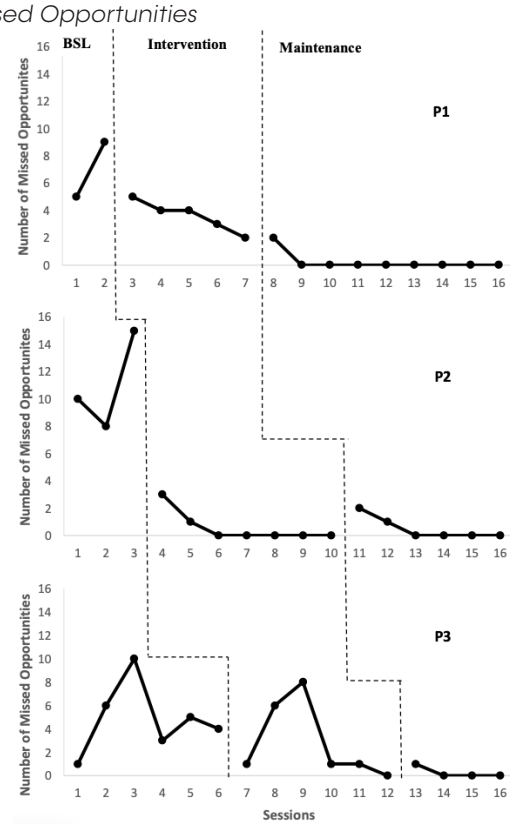

Note: This graph depicts results for three behavior technicians and latency of the delivery of reinforcement. Data are reported as the average latency for each participant across session samples during three phases: baseline, intervention and maintenance.

Participant 1 reached criteria for the delivery of reinforcement after two intervention sessions before returning to baseline conditions at session eight. The average latency for delivery of reinforcement reduced to 3.31 s from the 14.46 s recorded at baseline. Participant 2 reached criterion for the delivery of reinforcement after one intervention session before returning to baseline conditions at session 10. The average latency for delivery of reinforcement reduced to 1.85 s from the 8.5 s at baseline. Participant 3 reached criterion for the delivery of reinforcement after one intervention session before returning to baseline conditions at Session 12. The average latency for delivery of reinforcement reduced to 3.46 s from the 5.87 s recorded at baseline. The average latency of the delivery of reinforcement for all participants maintained at or below the established criteria of no more than a 3 s latency between the required response and the delivery of an established reinforcer for all maintenance sessions.

Results for missed opportunities to deliver a prompt or reinforcement are presented in Figure 3. During baseline, Participant 1 missed opportunities to provide reinforcement or prompts on an average of seven opportunities. Participant 2 missed opportunities to deliver prompts or reinforcement on an average of 11 opportunities. Participant 3 missed opportunities to deliver reinforcement or prompts on an average of five opportunities. During intervention, the average number of missed opportunities reduced to three per session sample for Participant 1, zero missed opportunities per session sample for Participant 2, and the average number of missed opportunities reduced to three per session sample for Participant 3. All participants were exposed to probes across several weeks. Participant 1 had eight maintenance probes, Participant 2 had six probes, and Participant 3 have four maintenance probes. The average number of missed opportunities maintained at or below the established criteria of no more than three per session sample for all maintenance sessions.

**Figure 3**

*Missed Opportunities*




Note: This graph depicts results for three behavior technicians and missed opportunities to deliver a prompt and/or deliver reinforcement. Data are reported as the number of missed opportunities for each participant across session samples during three phases: baseline, intervention and maintenance.

*Data Analysis of Employee Satisfaction*

Results for Participant 1 on the JDI-JIG are presented in Table 1. Results indicated a baseline level of 55% for work on present job, which increased to 78% during the maintenance phase. The percentage of job satisfaction for pay was 59% and increased to 70% during the maintenance phase. In the facet of opportunities for promotion, Participant 1 had a job satisfaction score of 48% that increased to 70% when measured in maintenance. The supervision facet score was 61% at baseline and increased to 93% when measured during the maintenance phase. The score under people on your present job for Participant 1 was 80% at baseline and increased to 87% during the maintenance phase. The general score under job in general was 87% for Participant 1 at baseline, and increased to 91% after the intervention in the maintenance phase. Data are reported as percentages of job satisfaction across six facets.

**Table 1**
*Results by Percentage for Participant 1*

| Item | Baseline | Maintenance |
|---|---|---|
| Work on present job | 55 | 78 |
| Pay | 59 | 70 |
| Opportunities for promotion | 48 | 70 |
| Supervision | 61 | 93 |
| People on your present job | 80 | 87 |
| Job in general | 87 | 91 |

Results for Participant 2 on the JDI-JIG are presented in Table 2. Results indicated a baseline level of 80% for work on present job which increased to 89% during the maintenance phase. The percentage of job satisfaction for pay was 67% and increased to 70% during the maintenance phase. In the facet of opportunities for promotion, Participant 2 had a job satisfaction measure of 78% that remained stable, scoring the same 78% when measured in maintenance. The supervision facet score was 63% at baseline and increased to 96% when measured during the maintenance phase.

**Table 2**
*Results by Percentage for Participant 2*

| Item | Baseline | Maintenance |
|---|---|---|
| Work on present job | 80 | 89 |
| Pay | 67 | 70 |
| Opportunities for promotion | 78 | 78 |
| Supervision | 63 | 96 |
| People on your present job | 85 | 96 |
| Job in general | 87 | 96 |

The score for people on your present job for Participant 2 was 85% at baseline and increased to 96% during the maintenance phase. The general score of job in general was 87% for Participant 2 at baseline, and it increased to 96% after the intervention in the maintenance phase. The JDI-JIG scale provided a measure of job satisfaction in numerical form with a top score of 54 for each facet. The percentage in this table was determined by measuring the actual score and dividing it by the total possible score to provide a percentage that was applied as level of job satisfaction for the specified facet across two phases of the intervention. The scores indicated the level of job satisfaction the participant had prior to receiving the intervention (i.e., baseline) and after receiving the intervention (i.e., maintenance).

Results for Participant 3 on the JDI-JIG are presented in Table 3. Results indicated a baseline level of 55% for work on present job, and the level increased to 77% during the maintenance phase. The percentage of job satisfaction for pay was 77% and increased to 85% during the maintenance phase. In the facet of opportunities for promotion, Participant 3 had a job satisfaction measure of 48% and increased to 77% when measured in maintenance. The supervision facet score was 62% at baseline and increased to 92% when measured during the maintenance phase.

**Table 3**
*Results by Percentage for Participant 3*

| Item | Baseline | Maintenance |
|---|---|---|
| Work on present job | 55 | 77 |
| Pay | 77 | 85 |
| Opportunities for promotion | 48 | 77 |
| Supervision | 62 | 92 |
| People on your present job | 85 | 87 |
| Job in general | 87 | 90 |

The score under people on your present job for Participant 3 was 85% at baseline and increased to 87% during the maintenance phased. The general score of job in general was 87% for Participant 3 at baseline, and it increased to 90% after the intervention in the maintenance phase. The JDI-JIG scale provided a measure of job satisfaction in numerical form with a top score of 54 for each facet. The percentage in this table was determined by measuring the actual score and dividing it by the total possible score to provide a percentage that was applied as level of job satisfaction for the specified facet across two phases of the intervention. The scores indicated the level of job satisfaction the participant had prior to receiving the intervention (i.e., baseline) and after receiving the intervention (i.e., maintenance).

**Summary of Results**

The results provided evidence to support the use of the Supervisor Training Curriculum: Evidence-Based Ways to Prompt Work Quality and Enjoyment Among Support Staff (Reid et al., 2011) as an intervention package for evidence-based supervision strategies to improve treatment fidelity and job satisfaction for behavior technicians. Participants all reached the established criterion within 1 to 4 sessions and maintained levels at or below criterion across several weeks postintervention. The results of the JDI-JIG showed that all three participants had an increase in job satisfaction from baseline conditions across multiple facets of their job.

**Discussion**

The purpose of this study was to evaluate the effects of the Supervisor Training Curriculum: Evidence-Based Ways to Promote Work Quality and Enjoyment Among Support Staff (Reid et al., 2011) as a model to be used by a behavior analyst when supervising behavior technicians providing ABA-based services for a child with ASD. The supervision training curriculum developed by Reid et al. (2011) outlined 11 areas of evidence-based practice in supervision. The curriculum provided a structured protocol that can be applied to behavior analysts who are supervising technicians. The curriculum provides a model that offers behavior analysts a way to incorporate evidence-based practices into every supervisory session. The strategies outlined are intended to support the growth and development of the technicians while also promoting enjoyment in their work. Although behavior analysts are often familiar with evidence-based strategies that can be applied within their supervision sessions, the application of strategies can be inconsistent and lack structure. By incorporating a more structured approach, such as that provided in the supervisor training curriculum, behavior analysts can ensure they do not miss important components to supervision.

Typically, the structure, quality, and outcomes of clinical supervision are dependent on the decisions and experience of the supervising behavior analyst. Although they are required to receive training in supervision, this training often focuses on supervision of a trainee with less emphasis on supervision of a supervisee. Consequently, it is common for clinical supervisory skills to be learned on the job, by trial and error, or through self-initiated, but not required, post certificate training. The supervision training curriculum used in this study provided an overview of evidence-based practice in supervision, and competency testing was used as a tool to determine whether a behavior analyst, acting as a clinical supervisor who attended the training, met minimum levels of competency to provide supervision. This tool could be used as a general guide for any behavior analyst who will be acting as a supervisor and may provide a strong foundation for clinical supervisors to use.

The clinical supervisor in this study generalized supervisory practices learned in a 2-day training to his practice. A generalization observation was scheduled following training, and a final competency checklist was completed to assess their implementation of the strategies in a real-world setting. The generalization session showed a 100% accuracy on the competency checklist completed 4 weeks after training. Prior to receiving the 2-day training on supervision, the clinical supervisor reported that they had at least a basic understanding of all areas that were covered in the modules; however, they did not have a strategy to pull each of them together to structure his supervision practices. After receiving training, the supervisor changed their approach to supervision to include evidence-based supervisory strategies across all direct supervision sessions.

The three technicians had an inconsistent latency of the delivery of reinforcement and prompts, as well as exceeded the expected number of missed opportunities to provide a reinforcer or prompt at baseline. The three participants did not meet fidelity at baseline when treatment fidelity was measured. The degree of variability was mixed across all three participants. Treatment fidelity can be measured by analyzing how closely a treatment is implemented to the way it was designed.

The treatment protocols outlined that the latency-to-delivery prompts should be 2-5 s, reinforcement should be delivered within 3 s of the choice response, and there should be no more than three missed opportunities per session. The baseline level for Participant 1 showed that, across two consecutive sessions, the average latency was 24.07 s to deliver a prompt, 14.46 s to deliver reinforcement, and the participant missed an average of seven opportunities. Consequently, Participant 1 had three target areas that required intervention to achieve a higher level of fidelity. Participant 2 had an average latency to prompt of 38.2 s, 8.5 s to reinforce, and 11 missed opportunities at baseline; all three target areas were well beyond achieving fidelity. Participant 3 had an average of 4.1 s, 5.87 s to reinforce and missed opportunities an average of five times at baselined. Participant 3 was close to fidelity prior to the intervention across all three target areas.

Upon receiving a more structured approach to supervision, each of the behavior technicians achieved and maintained improvements in the level of treatment fidelity. Participant 1 made dramatic improvements in reducing the latency for the delivery of prompts and reinforcement as well as reducing missed opportunities within session samples significantly. With the change

to supervision strategies, Participant 1 reduced the average latency to well within that required to meet fidelity benchmarks. The results for Participant 2 were no different, having been previously exposed to the implementation of the teaching protocols; however, there were significantly longer latencies than designed across both prompts and reinforcement at baseline, as well as concerns with missed opportunities. After receiving the intervention, treatment fidelity improved across all three target areas, reducing the latency to well within those outlined in the treatment protocols. Interestingly, Participant 3 was close to meeting fidelity across all three target areas at baseline. Having more experience, 11 years as a behavior technician, implementing similar protocols may have afforded her an advantage. Participant 3 did show improvements and reduced the average latency for both the delivery of prompts and reinforcement as well as missed opportunities to an average of zero before returning to baseline conditions and maintaining that level across at least three session samples. These improvements, although seemingly minor, may make a difference in treatment outcomes. As expected, there were improvements in treatment fidelity with the implementation of an evidence-based structure supervision model.

It was clear, from the findings, that after receiving more structured supervision that consistency incorporated evidence-based strategies there was a positive effect on the level of treatment fidelity. The level of treatment fidelity for all participants showed a range from significant to minor across all participants. Although the researcher assumed there would be some difference between the latency and some missed opportunities, during baseline sessions, participant 1 and participant 2 showed a latency of between 24 seconds to as much as 59 seconds before delivering prompts, with a protocol designed to deliver the prompt within 2 to 5 seconds after the instruction. Not reported in the data, but appearing in the session samples, were repeated deliveries of the Sd before ultimately prompting the choice response. This deviation from the protocol as designed could be potentially detrimental to the overall success of the client. This unexpected finding reinforced the need for an intervention targeted on improving supervision strategies that included focusing on treatment fidelity.

The findings in this study indicated that the quality and type of supervision influenced the level of job satisfaction for technicians. The tool used to analyze job satisfaction; the JDI-JIG is designed to assess the level of job satisfaction across several components of an individual's job. From the research, job satisfaction is highly correlated with an individual's perception of their relationship with their supervision (Eisenberger et al., 2002). The researcher anticipated that, with an improved quality of supervision that incorporated empirically validated strategies, there would be improvements in the satisfaction level. As expected, job satisfaction, as it relates to the clinical supervision, improved across participants. Results indicated a significant change in this area of job satisfaction; at baseline, all three participants' supervision satisfaction levels were around 60%, and, after the intervention, they improved to over 90% satisfaction.

The researcher also expected that there may be improvements in the job satisfaction area of work at the participants' present job. The reason for this expectation was because the participants were asked to consider the specific case assignment when responding to this prompt in the survey. The researcher expected that the participants would be more satisfied with their work on that case assignment if they were implementing procedures with more integrity/fidelity. Research has indicated that, when employees are more competent in their job, they have a high level of satisfaction (Arifin, 2014). Therefore, receiving supervision focused on improving competency was likely to improve satisfaction. The supervision intervention had a strong emphasis on building skills to competency. The technicians had all been exposed to the teaching procedures prior to the intervention; however, previous supervision was not focused on building competency in the same way and reportedly was variable and inconsistent. The participants baseline level of satisfaction for work on present job ranged from 55% to 80% and increased to a range between 77% and 89%.

The technicians receiving the structured and improved quality of supervision not only had improvements to levels of treatment fidelity, but also marked improvements across all facets of job satisfaction assessed. The researcher anticipated that employee satisfaction for the research participants would be high prior to intervention, with the concern that an employee who was willing to volunteer to participate in a study without additional incentives would have a proactive work personality, which is linked to high levels of job satisfaction (Li et al., 2017). Employees with proactive personalities are those individuals who taken initiative, engage in a wide range of activities, and are actively engaged in activities in the workplace (Li et al., 2017). However, the findings were inconsistent with those of Li et al. (2017), as all participants, showing some aspects of proactive personalities and highly engaged workers, showed areas for improvement in job satisfaction. Not surprisingly, Participant 3, who had been employed with the organization the longest, had the highest baseline and postbaseline results. This supports the previous studies that have indicated job satisfaction correlates with an increase in retention (Yarbrough et al., 2017).

In this study, the participants did not have a change in clinical supervision strategies across any of their other case assignments. Therefore, they were receiving the same manner of clinical supervision as they received in the past in all other areas of their work outside of the specific case assignment for the study. One would expect that all other areas may reflect no change in satisfaction level. However, the findings indicated that, by simply changing the supervision methods for one case assignment, there may be improvements across other facets of job satisfaction.

All three technicians had been trained on and implementing the teaching protocol for at least 30 days prior to the baseline phase. It was determined at baseline that they were not implementing the protocols with fidelity. The supervisory strategies the clinical supervisor was using prior to the intervention were producing low levels of fidelity. At the start of the intervention, high rates of fidelity were reached quickly, meeting established criterion within one to four supervision sessions, with results maintaining for several weeks without direct intervention. The clinical supervisors who are supervising in a similar manner may find the results applicable when they are overseeing technicians who have low fidelity in implementation.

Children receiving services may have the potential for improved outcomes from technicians who are receiving structured quality supervision, such as the one used for this study. During the baseline phase, challenging behaviors were exhibited by the client receiving the treatment. Although it was not the purpose of this study, upon the implementation of the intervention, the rates of challenging behavior decreased as the delays in the latency of the delivery of prompts and reinforcement decreased. With the reduction in challenging behavior, there were increased teaching opportunities across session samples. Although speculative, low levels of fidelity may have been contributing to the behaviors displayed by the child during sessions, as it appeared problem behavior decreased over time in the recorded video samples. Higher levels of treatment fidelity have previously been associated with decreases in challenging behaviors (Pinkelman & Horner, 2017).

The results of this study may be valuable to those who provide similar tiered model services such as nurses, teachers, and occupational therapists. The study provides a practical and cost-effective training package as well a strategy to assess job satisfaction across several facets. In the field of ABA, there are high rates of turnover (Novack & Dixon, 2019). The skills gained by the behavior analyst participant in this study proved influential in contributing to better treatment fidelity and job satisfaction. The improvements across all facets of the job satisfaction could indicate that, by making a minor change to supervision quality, job satisfaction can potentially improve globally. Using instruments, such as the JDI-JIG, may help organizations gain a better understanding, monitor, and take actions as they relate to job satisfaction.

*Limitations*

Prior to the start of the study, the researcher was aware of the risks related to exposure to extended baseline conditions. Due to this limitation, the researcher observed baseline closely across participants to avoid prolonged exposure. It was determined that Participant 1 was a potential risk for this challenge; therefore, baseline was shortened to only two sessions. Decreasing the baseline for Participant 1 could make the results less reliable, as a stable baseline is best achieved by evaluating behaviors from at least three data points and, in this case, ideally three sessions (Kazdin, 2010).

Another potential limitation to the current design was the issue of generality. In the study, participants had similar pre-baseline demographics. The results of this study cannot be assumed as generalizable outside of the specific setting and beyond the specific participants or even beyond what was achieved on the specific case assignment. As with all single-subject research, generalization to a larger population can only be shown with future replication studies, where manipulations of the subjects and settings can be made. Another limitation to study was related to irreversibility. The newly acquired skills of supervision could not be removed from the supervising behavior analyst who was instructed to stagger the intervention across the three technicians; therefore, it is not possible to know if the clinical supervisor inadvertently began some portions of the intervention with one or more of the participants prior to the onset of the intervention. In addition, the researcher focused on only a few areas associated with treatment fidelity (i.e., latency of delivery of prompts and reinforcement). This is a limitation to the findings of the study; further studies should investigate additional areas of treatment fidelity to examine if similar results are established.

Although the results of this study are promising, there are limitations related to generalization. The results are specific to the participants and their learning histories, as well as the specific case assignment and the target behaviors evaluated. It is not clear if the same results would be found with other participants, across other target behaviors, with a difficult case assignment. Additionally, these results can only be applied to the specific service model and practices of the ABA agency used as the research site. It is not possible to know if these results could be generalized across other ABA service provider agencies without future research. Furthermore, while there was an increase in job satisfaction across participants practice effects

could occur because of the participants previous exposure the JDI-JIG.

*Future Research Directions*

Turnover is a problem in the field of ABA. Research has shown job satisfaction as an important factor in reducing turnover (Abbasi & Hollman, 2000; Ezeh & Olawale, 2017; Kuo et al., 2014). The results related to the employee job satisfaction were favorable in this study, and future research directions could focus on long-term gains of job satisfaction, or the factors related to turnover of behavior technicians. Future research could expand on the number of supervisors using the supervision curriculum (Reid et al., 2011) across a diverse pool of technicians. Additionally, an extension to this study could focus on broadening the setting of the intervention assessing whether the intervention could be generalized across other settings and other types of providers.

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# Progress in Moving Toward a More Progressive Approach to Applied Behavior Analysis

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## Abstract

Leaf and colleagues (2016) provided a definition and description of progressive applied behavior analysis (ABA) in the context of autism treatment in which a behavior analyst takes a structured, yet flexible, approach to treatment that is responsive to the learner and includes on-going, in-the-moment analysis of teaching. Since Leaf and colleagues' publication, there have been many research and dissemination advancements across the domains outlined in the original paper. This includes advancements in the types of progressive procedures implemented, instructional arrangements, progressive reinforcement strategies, preventive functional analysis, progressive discrete trial teaching, data collection, progressive curriculum development, and staff training. The purpose of this paper is to highlight these advances citing peer-reviewed research where possible. Although many advancements have occurred, there is still a great need in the field of ABA for more clinicians and researchers to evaluate and implement procedures associated with the progressive approach to ABA. The paper will conclude with a call to action for behavior analysts to move away from rigid, protocolized, and conventional ABA practices and move towards implementing progressive ABA.

**Keywords:**

Progressive Applied Behavior Analysis, ABA, Autism Spectrum Disorder, ASD

## Introduction

A progressive approach to applied behavior analysis (ABA) is a philosophical approach in which behavior analysts employ a structured, yet flexible, approach to behavior change. This approach is used most often in the context of behavioral intervention for autistic children/children diagnosed with autism spectrum disorder (ASD) in which changes in the behavior of the interventionist are contingent upon and responsive to the learner and based on the interventionist's clinical judgement, analysis, and in-the-moment assessment of relevant contextual variables. Progressive ABA was first discussed in an article by Leaf and colleagues (2016) entitled "Applied Behavior Analysis is a Science and, Therefore, Progressive", but the authors discuss that the roots of progressive ABA began early in the field of ABA with the clinical and experimental work of individuals

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such as Montrose Wolf (e.g., Wolf et al., 1963), Teodoro Ayllon and Nathan Azrin (e.g., Ayllon & Azrin, 1965), Sandra Harris (e.g., Harris, 1975), Ivar Lovaas (e.g., Lovaas, et al., 1973; Lovaas 1987), Donald Baer (e.g., Baer et al., 1967), and Barbara Etzel (e.g., Etzel & Gewirtz, 1967)[1]. The early work of these pioneers in the field of ABA used the science of behavior analysis to change socially important behaviors using a structured yet flexible approach, altering their interventions frequently based on in-the-moment analysis and clinical judgement (Leaf, Leaf, McEachin, 2018; Leaf, Leaf, McEachin, & Cihon, 2018). One study in which this approach is exemplified is Wolf and colleagues (1963) in which they described the application of operant behavior procedures while working with a 3-year-old autistic child, Dicky. Wolf and colleagues used the principles of behavior to decrease temper tantrums, decrease challenging behavior around bedtime, teach Dicky to wear his glasses, teach Dicky communication and verbal behavior, and increase eating appropriately during mealtimes. Wolf and colleagues implemented procedures such as differential reinforcement, time-out, extinction, discrimination training, and shaping while they worked with Dicky to increase appropriate behaviors and decrease challenging and harmful behaviors. The paper is written as a case-study that describes the problem-solving process the researchers went through, which exemplifies a structured, yet flexible, approach. For example, as Wolf and colleagues described the process of teaching Dicky to wear his glasses, the authors discuss the original plan to reinforce glasses wearing with Dicky's full prescription glasses. However, because past attempts to wear those glasses had been associated with physically being forced to wear them, the authors adjusted their plan and instead began to shape glasses wearing with glasses that had empty frames before reintroducing the prescription glasses. Throughout the paper, Wolf and colleagues discuss the "original plan" (p. 309) but then review the variables that led them to deviate from the plan based on their analysis and clinical judgement.

Implementation of a progressive approach to ABA relies heavily upon well-trained and clinically skilled interventionists and supervisors that can use clinical judgement to be responsive to the learner and other relevant contextual variables to make in-the-moment decisions based on their analysis (Leaf et al., 2016). Clinical judgement allows the interventionist to make decisions in-the-moment based on environmental factors (e.g., distractions in the room) and client variables (e.g., attending; Leaf, Leaf, & McEachin, 2018). Decisions based on clinical judgement are influenced by a knowledge of scientific principles, long and short-term goals of the learner, current environmental conditions, personal experiences and other relevant factors (Redelmeier et al., 2001). By possessing a breadth of knowledge of the basic principles of ABA, interventionists are likely to have a better understanding of how to predict patterns of behavior and manipulate the environment to increase the likelihood of the desired behavioral goal (Leaf et al., 2016).

Within a progressive approach to ABA, interventionists must also be familiar with, and able to implement, a variety of procedures such as discrete trial teaching (DTT; Smith, 2001), the teaching interaction procedure (e.g., Leaf et al., 2009), and incidental teaching (e.g., McGee et al., 1999), as well as understand the advantages and disadvantages of each procedure to determine the most appropriate procedure to use at any given time. For example, an interventionist implementing the Cool versus Not Cool™ procedure (CNC; Leaf et al., 2012) to teach interactive play skills may determine that the learner does not have some general knowledge skills that are necessary to engage in the more complex skill being taught through the CNC. Therefore, the interventionist may first implement DTT to develop a general knowledge repertoire. Once this is learned, the interventionist may shift back to the CNC while embedding the skills learned through DTT. In this example, the interventionist determined which skills need to be targeted, the most effective and efficient way to teach the skills, and shifted between procedures as needed for progress.

Shifting between procedures is only beneficial if the interventionist has thorough knowledge of the short- and long-term goals of the learner. The long-term goals are the skills that are determined to be developed for the client to have maximized independence, happiness, and quality of life. These skills are broken down into smaller parts that are developed with the short-term goals of the learner. If the learner is doing well with the current short-term goal, for example taking turns in conversation, the next goal, perhaps initiating a conversation, would be the next step needed to reach the long-term goal of engaging in meaningful conversation to develop meaningful relationships with others. If the interventionist encounters difficulty with a short-term goal, the interventionist must be able to accurately identify the skill deficit interfering with learning the skill, develop that skill, then embed the skill within the overarching goals that are targeted through programming. For example, if a learner seems to have a deficit identifying common objects, the interventionist must identify if the deficit is due to difficulty with recall, lack of attending to the items (e.g., not looking at the correct object), interfering behaviors (e.g., grabbing materials during instruction), lack of problem-solving (e.g., not choosing the unknown item in a group of known items), prompt dependency, or another issue. Many of these deficits might shift the focus of the curriculum to developing learning-how-to-learn skills, rather than simply adding programming to increase receptive language (or listener behavior).

A progressive approach to ABA stands in contrast to a conventional approach to ABA in which the interventionist's behavior is responsive to a pre-determined protocol rather than the learner's behavior in-the-moment (Leaf, Leaf, McEachin, & Cihon, 2018). These protocols are typically developed after a formal functional assessment and used in an effort to increase or decrease a target behavior. Supervisors will then provide initial and ongoing training to ensure that the interventionists continue to implement the protocol with fidelity. Other formal procedures, such as the type of preference assessments and prompting systems, are selected by the supervisor and the interventionists are expected to conduct specific procedures within a learner's session. While the procedures are typically individualized to the client, the procedures used with each client are likely to remain consistent until a predetermined measure of mastery has been met, or no progress is reported after a period of time. When considering if intervention is effective, there is no determined time period where a reevaluation or change must be made but waiting for a clear trend in the data could mean days or weeks of ineffective intervention until modifications are made to a behavior plan. These practices are commonly regarded as standard within the field of ABA and autism treatment. It is a way to protect the consumer to ensure only evidence-based procedures are being implemented, and that they are being implemented correctly. However, with the advancement of research for effective procedures and a sudden need to quickly provide services for the high demand in autism treatment, some procedures may be put into place that may or may not have been detrimental to the science and the outcome of treatment overall. With an over emphasis on procedural replicability, there may be some nuanced skills and methods that may have been lost over time. These restrictions may include: (a) implementing only one procedure for a target behavior, (b) overreliance on possible reinforcers only identified through formal preference assessments, (c) use of only continuous data collection procedures, (d) using only one prompting system, and (e) only following one curriculum book/program. This approach may lose the clinical and applied significance of ABA within autism treatment (Leaf et al., 2016).

Although Leaf and colleagues' (2016) discussion of a progressive approach to ABA was only published seven years ago, much has changed in the field of ABA and autism treatment. For example, at the time Leaf et al. (2016) was published the authors cited that there were "over 17,000 certified behavior analysts and between 3000 to 5000 registered behavioral technicians" (p. 721). Current data now shows that there are over 65,000 Board Certified Behavior Analysts and Board Certified Assistant Behavior Analysts and over 130,000 Registered Behavior Technicians (Behavior Analyst Certification Board, n. d.). That is tremendous growth in just seven years and this growth has advantages and disadvantages. With more certified individuals and direct line technicians, more individuals diagnosed with ASD can access services. But along with this growth has come an increase in criticism and concern when it comes to ABA based interventions and autism treatment. These concerns and criticisms include the use of physical punishment used during autism treatment at the UCLA Young Autism Project in the 1970s, shock to treat harmful behaviors, intervention intensity (i.e., 40 hours a week), rigid interventions, extinction-based procedures, targeting self-stimulatory and stereotypic behavior, selection of inappropriate goals, lack of social validity, inherently changing an individual's personality, ABA is abusive, and ABA produces long-term negative outcomes (Leaf et al., 2022). Many of these concerns and criticisms are likely to be mitigated by the implementation of a progressive approach to ABA that is focused on family and learner involvement, assessment of social validity and applied significance, well-trained staff, and the implementation of flexible, responsive procedures and programming. What follows is an update on the advances in research and dissemination of a progressive approach to ABA across the domains Leaf and colleagues (2016) originally outlined and a call to action for more clinicians and researchers to evaluate and implement procedures associated with the progressive approach to ABA.

### *Advances in Progressive ABA*

#### *Not Just One Procedure*

Leaf and colleagues (2016) outlined how progressive, quality, early intensive behavioral intervention (EIBI) does not involve the implementation of just one set of procedures. Instead, a variety of evidence-based procedures should be employed to teach learners diagnosed with ASD (e.g., DTT, shaping, role-play, video modeling, prompting, chaining). Well-trained, quality interventionists implementing a wide variety of behavior analytic procedures to address respondent and operant behavior allow learners to make progress quickly. A research study that highlights this component of the progressive approach to ABA was conducted by Leaf, Leaf, and colleagues (2017).

Leaf, Leaf, and colleagues (2017) evaluated a behaviorally based social skills group for 15 children diagnosed with ASD using a progressive approach to ABA. The behaviorally based social skills group was conducted by two lead teachers and two support teachers. The lead teachers had at least five years of experience implementing progressive ABA interventions with children diagnosed with ASD and the support teachers had at least two years of experience. The 15 participants were randomly divided into group A (8 participants) or group B

(7 participants) with the participants in group A receiving treatment in the behaviorally based social skills group first and group B receiving treatment 16 weeks later. The teachers implemented a variety of behavior analytic procedures throughout the social skills groups. These procedures included group DTT, the CNC procedure, the teaching interaction procedure, shaping, modeling, incidental teaching, flexible prompt fading, embedded instruction, and a variety of reinforcement systems such as a level system and individualized token systems for learners in the group who needed more support. These procedures were often used in combination to target various skills. For example, to teach making on topic statements the teachers used group DTT, modeling, and the teaching interaction procedure across multiple sessions to increase the participants' use of on-topic statements during conversation. The results demonstrated that all participants made statistically significant improvements in their social behavior following their participation in the social skills group and the improvements maintained up to 32 weeks after the social skills group had concluded. This study highlights the meaningful gains children diagnosed with ASD can make when a variety of behavior analytic procedures are used to teach valuable skills. Additionally, this study highlights the role of clinical judgement when implementing a progressive approach to ABA. The teachers employed a structured, yet flexible, approach each session and would add or change the procedures used to target the social skills depending on how the participants in the group responded. Strict protocols were not written or followed throughout the study, and instead the teachers assessed in-the-moment what changes needed to be made for the participants in the group to be successful which often involved the combination of behavior analytic procedures.

*Instructional Arrangements*

Leaf and colleagues (2016) discussed that within a progressive approach to ABA intervention should occur within a variety of instructional arrangements. Initial intervention may typically start in one-to-one instruction, but as learning-how-to-learn skills are acquired, a progressive approach to intervention should move toward a more dynamic environment. Leaf and colleagues (2016) highlighted group instruction as a critical component to quality progressive behavioral intervention. Since Leaf et al. (2016), several studies on progressive ABA have been conducted evaluating skill development across instructional arrangements. These instructional arrangements include learning in a dyad (e.g., Cihon, Ferguson, Leaf et al., 2019; Ferguson, Majeski et al., 2020), small group (e.g., Cheung et al., 2022; Leaf, Cihon et al., 2017), large group (e.g., Leaf, Leaf et al., 2017; Milne et al., 2017), one-to-one (e.g., Cihon et al., 2020; Ferguson, Leaf, et al., 2020), and via telehealth (e.g., Cihon et al., 2021; Ferguson, Majeski et al., 2020). Multiple procedures were evaluated in dyad and group formats including instructive feedback (e.g., Ferguson, Majeski et al., 2020; Leaf, Cihon et al., 2017), the CNC procedure (e.g., Milne et al., 2017), group DTT (e.g., Leaf, Cihon et al., 2017), embedded instruction (e.g., Cheung et al., 2022), and the use of a level system (e.g., Cihon, Ferguson, Leaf et al., 2019).

Leaf, Cihon et al. (2017), conducted in a small group arrangement, highlighted the observational learning that can occur when instruction is conducted in a group. Specifically, Leaf, Cihon, and colleagues evaluated the use of instructive feedback during group DTT with nine children diagnosed with ASD. Instructive feedback is the practice of consistently presenting non-target information during the antecedent or consequent portion of a discrete trial (Werts et al., 1995). For example, an interventionist would present a picture of a kiwi, provide an instruction (e.g., "What is it?"), the learner would respond (e.g., "kiwi"), and then the interventionist would provide praise and instructive feedback (e.g., "Yes! You're right and a kiwi is a fruit"). In this example, the primary target is the label "kiwi" and the secondary target presented via instructive feedback is that a kiwi is a fruit. When implementing instructive feedback, the learner is not required to respond to or echo the instructive feedback and reinforcement is not provided contingent upon responses to the instructive feedback. Therefore, if a learner acquires the secondary target it is considered to be "free" learning because the response was not directly taught or reinforced.

Leaf, Cihon, and colleagues (2017) divided the nine participants into three groups of three in which group DTT with instructive feedback was used to directly teach the names of two superheroes to each participant in the group. The instructive feedback provided throughout group DTT was the superhero's superpower (e.g., super strength). The purpose of the study was to assess if the participants learned the primary targets (i.e., superhero's names) taught through group DTT, the secondary targets (e.g., superpowers) targeted through instructive feedback, and the primary and secondary targets of their peers through observational learning. Leaf, Cihon, and colleagues found that all nine participants learned their primary targets, the secondary targets provided via instructive feedback, and learned the primary and secondary targets of their peers in the group. Therefore, in this study, the participants were directly taught only two targets but learned an additional eight targets for "free" through instructive feedback and observational learning. This study highlights how learning can be maximized in a group setting, which is a core component of progressive ABA, as compared to a one-to-one setting.

*Reinforcement*

Reinforcement is a core component of not just progressive ABA, but any ABA-based intervention or procedure. Key differences in reinforcement in a progressive approach to ABA compared to a conventional approach include how interventionists identify reinforcers, the types of reinforcers used, the variety of reinforcers used, and the types of reinforcement systems implemented. For example, within a progressive approach to ABA interventionists rarely (if ever) use formal preference assessments (e.g., paired stimulus preference assessment, multiple stimulus without replacement) to identify items that might function as reinforcers. Instead, interventionists are trained in how to assess if an item may serve as a reinforcer in-the-moment (i.e., in-the-moment reinforcer analysis; IMRA). Interventionists are trained to assess and analyze if an item would be likely to function as a reinforcer by assessing a variety of variables including: (a) the learner's affect with the item, (b) the learner's previous history with the item, (c) the learner's verbal and non-verbal behavior, (d) current motivating operations, and (e) the learner's previous responding (see Table 1 for skills to develop for IMRA). Another difference between progressive and conventional ABA approaches are the types of reinforcement systems used. Within a progressive approach, reinforcement systems are often implemented in a flexible manner in which the amount, type, or schedule of reinforcement provided is not predetermined. Instead, the interventionist has the flexibility to assess and determine the magnitude of reinforcement provided, what type of reinforcer will be used, and the schedule of reinforcement based on the learner's responding and treatment goals. Finally, a distinct feature within a progressive approach includes the frequent incorporation of conditioning procedures to expand the number of stimuli that function as reinforcers, as well as transitioning toward the use of naturally occurring consequences to reinforce behaviors (Leaf, Milne, et al., 2020).

Since the publication of Leaf et al. (2016) there have been several research and dissemination advancements in a progressive approach to reinforcement. This includes continued research on IMRA (Alcalay et al., 2019; Leaf, Leaf, Leaf, et al., 2018), research on changing preferences through observation (i.e., Cihon, Weiss, et al., 2021; Leaf, Oppenheim-Leaf, et al. 2016), and research on flexible reinforcement systems such as a levels system (i.e., Cihon, Ferguson, Leaf, et al., 2019) and a token economy with a flexible exchange rate (i.e., Cihon, Ferguson, Milne, et al., 2019). An additional dissemination advancement has been the addition of IMRA in the chapter on positive reinforcement within the predominant behavior analytic textbook (i.e., Applied Behavior Analysis; Cooper et al., 2020). Described next are two studies that highlight some of the advancements that have occurred in the research evaluating a progressive approach to reinforcement.

Alcalay and colleagues (2019) further advanced the research on IMRA by comparing IMRA to multiple stimulus preference assessment without replacement (MSWO) on the rate of responding of four children diagnosed with ASD. Additionally, Alcalay and colleagues evaluated the use of IMRA and MSWO preference assessment procedures with interventionists who were not previously familiar with the reinforcer identification procedures. Finally, Alcalay and colleagues extended the literature on IMRA by requiring the interventionists to select rationales for the variables they were analyzing to determine which item to use to function as a reinforcer in the IMRA condition. These rationales included: (a) child affect, facial expression, and body language; (b) how the child interacted with the item; (c) frequency with

**Table 1.**

*Description of skills developed during staff training for IMRA*

| Step | Skill |
|---|---|
| 1 | Allows learner to sample potentially reinforcing items/activities free from demands and instructions |
| 2 | Provides the learner with choices and honors their choice |
| 3 | Follows the learner's lead |
| 4 | Analyzes and adjusts based on the learner's affect |
| 5 | Analyzes and adjusts based on the learner's non-verbal behavior (e.g., approach to item/activity, reaching for item) |
| 6 | Assesses if item/activity is functioning as reinforcer by observing if desired behavior is increasing or decreasing when reinforcer is held contingent |
| 7 | Continuously assesses learner's motivation for item/activity and observes for signs of deprivation and satiation |

which the item had been used during previous sessions or trials; (d) child's skill improvement; (e) item had a similar quality to other previously identified reinforcers; (f) the interventionist attempting to condition a new item to function as a reinforcer; (g) novelty of the item; and (h) child request for an item. The results demonstrated that the items selected to function as reinforcers through IMRA and MSWO preference assessments were equally effective at increasing the rate of responding for the participants, but the IMRA condition was more efficient when it came to the total time it took to determine items to serve as reinforcers. Additionally, Alcalay and colleagues found that the interventionists were responding to at least two variables most often when selecting the rationale(s) for why an item was selected as a reinforcer in the IMRA condition. This information is beneficial when it comes to training staff to implement IMRA as it is likely that interventionists will need to respond to more than one variable (e.g., learner affect and current motivating operations) when selecting an item to function as a reinforcer rather than just one factor in isolation (e.g., child request).

Cihon, Ferguson, Leaf, and colleagues (2019) evaluated the use of a level system implemented with flexible shaping to increase synchronous engagement with two dyads of children diagnosed with ASD. The level system consisted of three tiers. The top tier was titled "Superfriend" and if the child ended the session on that tier it resulted in 2 min of access to a treasure chest and being able to pick one item to keep. The middle tier was titled "Friend" and if the child ended the session on that tier it resulted in 2 min of access to a treasure chest, but the child could only play with the items in the treasure chest and could not keep an item. The bottom tier was titled "Miss out on a fun activity" and if the child ended the session on that tier it resulted in not earning access to the treasure chest. This study employed a flexible shaping approach while using the level system in which the interventionist used clinical judgement to determine if and how much each child moved up or down on the level chart at each check in. Variables the interventionist analyzed included the frequency and duration of synchronous engagement with their peer in the dyad compared to previous check-ins or sessions, responding to peer comments, responding to peer requests, following or checking-in with their peer, ignoring their peer, playing together, playing independently, and any aberrant behavior. The results of the study demonstrated that the use of a level system with flexible shaping was successful in increasing the percentage of intervals of synchronous engagement between the peers in the two dyads. This study also demonstrates how flexible, progressive interventions can increase socially important behaviors using an interventionist's analysis and clinical judgement in-the-moment, rather than relying on a predetermined protocol of when and how to reinforce desired behavior.

*Functional Analysis and Aberrant Behavior*

Leaf and colleagues (2016) discuss that a hallmark of quality, progressive ABA is the evaluation of the function of behavior within natural environments and only using analogue experimental functional analyses (e.g., Iwata et al., 1994) when necessary. Additionally, a progressive approach to functional analysis includes interventionists using their knowledge of the function of behavior to be preventative with their teaching by beginning to teach appropriate behaviors that result in access to important reinforcers (e.g., access to tangibles, escape, access to attention) at the onset of intervention (Leaf et al., 2016). Finally, Leaf and colleagues outline how well-trained interventionists often may be able to identify the function of behavior in-the-moment based on their analysis of the context and other relevant variables rather than relying on analogue functional analyses or standard functional assessments.

The biggest advancement since the publication of Leaf et al. (2016) with respect to a progressive approach to functional analysis was Ala'i-Rosales and colleagues' (2019) article entitled "The Big Four: Functional Assessment Research Informs Preventative Behavior Analysis" which provided guidelines for preventative and proactive intervention to teach a skill set that would prevent the occurrence of challenging behavior as opposed to conducting a functional analysis and teaching a functional alternative response following the onset of challenging behavior. Ala'i-Rosales et al. proposed the proactive development of four repertoires: (a) teaching learners to communicate their wants, needs, and likes/dislikes in a safe, effective, and respectful manner that are understood by others; (b) teaching learners to gain the attention and affection of others in a safe, effective, and pleasant manner that is understood by others; (c) teaching learners to joyfully and safely engage in a variety of activities alone and with others; and (d) teaching learners to cope and tolerate adversity in a safe and effective way. Since the publication of this paper, it has been cited 31 times (identified via Google Scholar) demonstrating its impact on the field of ABA in only a short amount of time. More research on a progressive approach to functional analysis is needed including research on in-the-moment assessment of function and research evaluating teaching the preventative skill set outlined by Ala'i-Rosales and colleagues.

*Discrete Trial Teaching*

The greatest advancements in the research on a progressive approach to ABA has been within

the research and publications on progressive DTT. Leaf and colleagues (2016) described a flexible approach to the implementation of DTT in which the interventionist makes in-the-moment assessments based on the learner's behavior to alter and change their implementation of DTT. These changes could include altering a prompt, changing the target, changing the instruction, manipulating the field size, moving the stimuli in the array, providing corrective feedback, increasing or decreasing the schedule of reinforcement, or interspersing known tasks.

The first advancement that occurred after Leaf and colleagues' (2016) publication was a paper providing guidelines on the implementation of progressive DTT (i.e., Leaf, Cihon et al., 2016). Leaf, Cihon, and colleagues (2016) provided eight guidelines for interventionists implementing progressive DTT: (a) select trial targets and placement of stimuli based on the learner, (b) use natural language when possible, (c) vary instructions as soon as possible, (d) use flexible prompt fading, (e) use instructive feedback to teach additional skills, (f) do not avoid error correction, (g) take data on a sliding scale, and (h) teach toward a busy environment. After these guidelines were published, the research on progressive DTT evaluating these guidelines increased. In the past seven years since the publication on progressive ABA and progressive DTT, over 15 publications evaluating components of progressive DTT have been published. Research has been conducted on the in-the-moment assessment of trial targets and placement of stimuli (e.g., Leaf, Cihon, Ferguson et al., 2018; Wong et al., 2020), the use of flexible prompt fading (e.g., Cihon et al., 2020; Leaf, Cihon et al., 2019), the effects of instructive feedback (e.g., Ferguson, Majeski et al., 2020; Leaf, Cihon et al., 2017), the effects of error correction (e.g., Aljohani et al., 2022; Isenhower et al., 2018; Leaf, Townley-Cochran et al., 2019; Leaf, Cihon et al., 2020; Townley-Cochran et al., 2017), and estimation data collection (e.g., Ferguson, Milne et al., 2020). These studies evaluating the individual guidelines of progressive DTT culminated in a study comparing a progressive approach to DTT to a conventional approach to DTT (Milne et al., 2022).

Milne and colleagues (2022) sought to compare progressive DTT to conventional DTT using a group design with 12 children diagnosed with ASD. The participants were randomly assigned to the conventional DTT group or the progressive DTT group and received 20 teaching sessions using the assigned methodology. The interventionist's goal was to teach as many tact relations as possible (up to 100 available unknown tact relations) using the conventional or progressive approach to DTT. The conventional DTT condition consisted of identifying reinforcers through a formal preference assessment, providing reinforcement on a fixed rate, using a static-simple instruction for every trial (i.e., "Who is it?"), counterbalancing the trial order of targets, implementing progressive prompt delay to teach targets, using error correction for incorrect responses, interspersing maintenance trials for mastered targets, and collecting data trial-by-trial. The progressive DTT condition consisted of identifying reinforcers through IMRA, providing reinforcement on a variable schedule based on the interventionist's clinical judgment, using varied instructions, basing trial order on the interventionist's assessment, implementing flexible prompt fading to teach targets, using a variety of feedback procedures (e.g., instructive, error correction, no feedback), conducting maintenance based on the interventionist's clinical judgment, and using estimation data collection procedures. Milne and colleagues found that both methodologies were effective at teaching tact relations but found statistically significant differences between how many tacts were learned by the participants in the progressive DTT group. On average, the participants assigned to the progressive DTT group responded at 90.4% accuracy on the post-assessment that tested their knowledge of the 100 tact relations, while the participants assigned to the conventional DTT group responded at 35.7% accuracy on the post-assessment. Therefore, this study demonstrated the significant benefits of implementing progressive DTT compared to conventional DTT for children with ASD.

**Data Collection**

A hallmark of ABA is the reliance on objective measurement and data collection procedures of observable and measurable events (Baer et al., 1968). Throughout ABA-based intervention and EIBI the data that are collected should be useful to the interventionists and supervisors and data should not be prioritized over teaching and reinforcer delivery (Leaf et al., 2016). A progressive approach to data collection is one that collects data on a sliding scale ranging from continuous data collection procedures to discontinuous, estimation data collection procedures (e.g., Ferguson, Milne et al., 2020; Taubman et al., 2013). The data collection procedures selected should be based on considerations such as what is needed for the child to make the most progress, what system will be most efficient for the interventionist, and what type of system will provide an accurate enough representation of the child's behavior for the interventionist and supervisor to make decisions. Within clinical practice of progressive ABA, interventionists commonly collect estimation data on programs with periodic continuous data collection samples. Since Leaf et al. (2016), an additional estimation data collection study has been published.

Ferguson, Milne, and colleagues (2020) sought to extend the previous literature on estimation data collection (i.e., Taubman et al., 2013) by comparing

estimation data collection procedures to trial-by-trial data collection procedures during DTT with three children with ASD. The data collection procedures were examined by measuring accuracy, rate of child acquisition of the DTT targets, and the number of teaching trials delivered per session. In the estimation data collection condition, the interventionist had 3 min to conduct DTT with flexible prompt fading. Specifically in the estimation data collection condition, the interventionist did not collect any data on child responding until after the 3 min had expired. Then, the interventionist used a rating scale to estimate the child's responding on the teaching targets. The rating scale was from 0 to 4 with the "0" representing 0-20 % independent correct responding on trials, "1" representing 21-40% independent correct responding, "2" representing 41-60% independent correct responding, "3" representing 61-80% independent correct responding, and "4" representing 81-100% independent correct responding. In the trial-by-trial data collection condition, the interventionist also had 3 min to conduct DTT with flexible prompt fading, but data were collected after each trial. Ferguson, Milne, and colleagues found that estimation data collection was accurate at determining mastery when compared to the test for mastery probe conducted after the interventionist estimated that the child had mastered the targets in the set. Additionally, when the estimation data ratings were compared to continuous data after the study had concluded it was found that the interventionist was accurate in their ratings except for one session in which they underestimated the learner's independent correct responding. Overall, this study demonstrated that estimation data can be an accurate form of data collection and may be beneficial within clinical practice when used in conjunction with other data collection procedures (Ferguson, Milne et al., 2020).

*Curriculum*

Within a progressive approach to ABA, curriculum books and programs are used as guidelines rather than a cookbook in which all steps and recipes need to be followed to the letter (Leaf et al., 2016). Those developing curriculum for a client from a progressive approach should first and foremost be knowledgeable on how to determine meaningful goals (discussed later). Once these are agreed upon and established with the client, those supervising the intervention (e.g., case supervisor) must be fluent with behavior analytic principles and various procedures that will effectively and efficiently progress the learner toward those goals. Additionally, the supervisor and interventionist modify procedures immediately if progress is not being made. This could include, but is not limited to, an adjustment to the prompting strategy, instructional procedures, rate of reinforcement, and materials used. Further, on-going and consistent supervision must occur to maintain the clinical skills of those directly implementing procedures ensure that the decisions made, especially surrounding modifications, are in line with the client's goals. The rate of supervision may vary based on the skills of the direct line interventionist. Additionally, progressive curriculum should focus on all areas of need for each child diagnosed with ASD which likely includes programs to reduce challenging behavior, teach social skills, teach learning-how-to learn behaviors, teach communication and language, teach play skills, teach self-help and adaptive behaviors, teach safety skills, and teach academic skills. Often a child's programmatic needs cannot be found in just one curriculum, which is why in a progressive approach to ABA multiple sources are used to create an individualized curriculum and programs are developed and created to meet the individualized needs to each child.

One advancement that has occurred in the domain of progressive curriculum is the publication of a new curriculum book for social skills groups entitled "The Autism Partnership Method: Social Skills Groups" (Leaf, Milne et al., 2020). Although the curriculum book is focused on curriculum that can be implemented in a group setting, many of the programs could also be implemented in a one-to-one instructional format. The curriculum found in the book is divided into five domains: (a) social interaction skills, (b) social communication skills, (c) social awareness skills, (d) social relatedness skills, and (e) social learning skills. A total of 92 skills and games are provided within the curriculum and are further divided into basic, intermediate, and advanced social behaviors. Leaf, Milne, and colleagues (2020) highlight that the programs found within the curriculum should be taken as guidelines, not rules to be followed, and should be modified for each child. As is standard within a progressive approach to ABA, curriculum will need to be modified based on the individual strengths and weaknesses of each learner as well as what social skills goals may be relevant and socially valid for each learner.

*Applied Significance*

Within a progressive approach to ABA, a clinician continuously assesses the applied significance and social validity (Wolf et al., 1978) of the goals, procedures, and effects of their program for each individual learner (Leaf et al., 2016). The assessment of social validity occurs so that our practices are humane, culturally responsive, collaborative, and compassionate for our consumers and relevant stakeholders. This is also an important component of many other standard ABA programs, but the assessment of social validity is something that has been lacking within applied behavior analytic research.

Kennedy (1992) found that less than 20% of articles published in the Journal of Applied Behavior Analysis (1968-1990) and Behavior Modification (1977-1990) included measures of social validity. Carr and colleagues (1999) found similar rates of the reporting of social validity with approximately 25% of articles reporting on social validity. Finally, Ferguson and colleagues (2019) found that only an average of 12% of articles published in the Journal of Applied Behavior Analysis between the years of 1999 to 2016 reported measures of social validity. The lack of assessment of social validity is not only a problem in behavior analytic research, but social invalidity is currently a large issue in the field of ABA, specifically as it relates to behavioral intervention for individuals diagnosed ASD. Increasing numbers of autistic individuals are expressing their disapproval of ABA services on social media and other platforms (Leaf et al., 2022), articles are being published claiming ABA based interventions are abusive (e.g., Sandoval-Norton & Shkedy, 2019) and cause post-traumatic stress disorder (e.g., Kupferstein, 2018), and ABA as a whole is being called unethical (Wilkenfeld & McCarthy, 2020). The assessment of social validity and the applied significance of ABA programs is needed now more than ever in the field of ABA. Fortunately, a recent review of the assessment of social validity in the journals of The Analysis of Verbal Behavior, The Behavior Analyst/Perspectives on Behavior Science, Behavior Analysis in Practice, The Behavior Analyst Today/Behavior Analysis: Research and Practice, Behavioral Interventions, Behavior Modification, Journal of Applied Behavior Analysis, and The Psychological Record found that the assessment of social validity occurred in 47% of the intervention studies reviewed (Huntington et al., 2022) demonstrating an increase in the percentage of social validity in journals other than the Journal of Applied Behavior Analysis. Huntington and colleagues (2022) also noted that there was a significant rise in the assessment of social validity between the years of 2019 and 2020. This is a positive trend in ABA research and hopefully this trend continues into clinical practice.

Within the recent research on progressive interventions, the results of the assessment of social validity have been positive. For example, Leaf, Leaf and colleagues (2017) assessed the social validity of a 16-week long behaviorally based social skills group. Social validity was assessed via an anonymous survey that asked 13 questions to the parents of the children that participated in the behaviorally based social skills group. Questions on the social validity survey asked parents to rate their satisfaction with the social skills group in general, satisfaction with the social and play skills their child learned in the group, satisfaction with the teachers that conducted the group, satisfaction with the procedures used to teach skills in the group, and more. Parents answered the questions using a 7-point Likert scale with a 7 representing "very satisfied" and a 1 representing "very dissatisfied". Results of the assessment of social validity indicated that the parents were satisfied with the behaviorally based social skills group outcomes, the procedures used, the skills taught within the group, and the teachers who conducted the group.

*Staff Training*

Well trained and highly skilled interventionists are critical when it comes to implementing a progressive approach to ABA. Interventionists implementing progressive ABA need to have a strong foundational knowledge of behavior analytic principles, critical thinking skills, be skilled in analysis and in-the-moment assessment, and engage in dynamic, fun, and compassionate programming (Leaf et al., 2016). Other indicators of a quality interventionist include being fun, innovative, objective, social, systematic, professional, and collaborative (Leaf, Milne et al., 2020). Additionally, staff need to know how to implement a wide variety of behavior analytic procedures (e.g., DTT, teaching interaction procedure, incidental teaching, chaining, shaping).

Within a progressive approach to staff training multiple modalities are used to train interventionists. This includes didactic training, role-play, modeling, feedback in-the-moment, and packaged procedures such as the teaching interaction procedure or behavioral skills training (Leaf, Milne, et al., 2020). Advances in progressive staff training research have emerged in the past seven years including research on using the teaching interaction procedure to teach interventionists to implement social skills interventions (i.e., Ferguson et al., 2021; Green et al., 2020) and the evaluation of a comprehensive staff training package used to teach a variety of behavior analytic procedures to newly hired interventionists (i.e., Cheung et al., 2020).

Cheung and colleagues (2020) evaluated the effects of a training package to teach four new interventionists 38 skills a direct line interventionist would need to engage in to work effectively with children diagnosed with ASD. The 38 skills included six targeting engagement strategies, six measuring the use of reinforcement, six related to the implementation of DTT, three related to prompting and prompt fading, six related to the implementation of mand training, two related to maximizing the child's progress in session, and nine related to behavior management techniques. These skills were assessed during 30 min probe sessions with a child diagnosed with ASD in which no training, feedback, or prompting was provided to the interventionists. During the probe, the researcher scored the interventionists' behaviors on a Likert scale from 0 (i.e., participant rarely/never displayed the skill) to 2 (i.e., the participant frequently/often/always displayed the skill). A unique feature of this training

study was the inclusion of a dual mastery criterion in which the participants first had to score 80% or above on two consecutive probes scored by the researcher, and then the clinic supervisor observed a 30 min probe to determine if the interventionist's performance was passable. The training methods used to teach the 38 skills occurred through didactic modules and hands-on training. Didactic training included behavior analytic readings and video presentations. Hands-on training included modeling from the trainer, discussion between the trainer and interventionist, and the interventionist working directly with a child while receiving prompts, praise, and feedback on their implementation of the targeted behavior analytic skills. The comprehensive training package was successful in teaching the interventionists the 38 targeted skills and the researchers found that it took an average of 429 hr to train the interventionists to mastery. This study demonstrates that the initial training of quality interventionists requires much more time than just 40 hr. Additionally, it should be noted that this study did not focus on teaching more advanced skills such as clinical judgement and analysis. The training of quality interventionists does not end after initial training and ongoing supervision and training is needed to continue to develop and refine a progressive teaching repertoire.

**Conclusion and Future Directions**

Although advances have been made when it comes to a progressive approach to ABA in autism treatment, there is still ample room for more research and clinical advancements. Quality, progressive ABA does occur in clinical practice, but unfortunately this is often the outlier and not the norm within the field of ABA. Research has shown that behavior analysts lack compassionate care and collaboration skills (e.g., Taylor et al., 2019), and the field has been criticized as engaging in ableism, abusive, and unethical practices (e.g., Wilkenfeld & McCarthy, 2020). As the popularity of ABA rises, so will the scrutiny of its practices. Some of the criticisms of abuse, ableism, and unethical practices may be a product of the short cuts in training made to meet the rapidly growing need for services. Without thorough training and support, professionals in the field may have strayed too far from its core values which have resulted in socially invalid goals, procedures, and effects of ABA-based treatment. Despite this seeming downfall, there are future directions that will ideally realign us to our roots and materialize the potential of ABA when executed as intended.

Regarding a progressive approach, more research is needed in the areas of staff training, functional analysis, and applied significance. Perhaps the biggest area of need within the staff training research is how to train staff to be skilled in analysis and clinical judgement. Research should specifically focus on what variables interventionists are responding to when making in-the-moment assessments and the procedures used when training others to respond to those variables in ways that lead to maximizing child progress.

Within the domain of progressive approaches to functional analysis, research is needed on the preventative, progressive approach of teaching the "big four" behavioral repertoires outlined by Ala'i-Rosales and colleagues (2019). Further research should aim to determine if these skills prevent challenging behavior, and if there will be a continued need for formalized experimental functional analysis if these skills are taught early within EIBI. Additionally, within this domain, research is needed on the accuracy and utility of in-the-moment assessment of function. Anecdotally, highly skilled clinicians often report that they can assess function of behavior in-the-moment, but research is needed on if this is true and if their assessment is accurate. Even further, if the corresponding intervention select based on the assessment of function results in socially significant changes.

More long-term research is needed on the progressive approach which analyzes the applied significance and social validity of the program's goals, procedures, and short and long-term effects. Questions remain as to if long-term outcomes are better when implementing a progressive approach to ABA when compared to standard or conventional approaches. Research is needed to evaluate outcomes in terms of IQ, language development, educational placement and other typically measured outcomes, but long-term outcome measures are also needed on aspects such as quality of life, meaningful relationships, employment, and independence.

Finally, more research groups and labs need to conduct, replicate, and extend previous research on a progressive approach to ABA. The current body of research is primarily derived from one research lab. This is not sufficient evidence in the field of ABA for procedures and practices to be considered evidence based. Research conducted on the progressive approach conducted outside of just one lab also allows for research lines to extend and more knowledge to be gained on the conditions under which a progressive approach is effective in autism treatment.

Within clinical practice, more behavior analysts need to implement progressive ABA procedures and devote resources to training interventionists in critical thinking skills, clinical judgement, and in-the-moment assessment. Currently, too much valuable instructional time is likely wasted on conducting procedures such as formal preference assessments when there is research available supporting how clinicians can identify reinforcers in-the-moment saving critical teaching

time. Although training in the progressive approach may be time-consuming (e.g., Cheung et al., 2020), the likely benefits may outweigh the initial costs of training. Staff that feel supported and highly skilled in their job are more likely to continue to work in their job role, therefore decreasing staff turnover (Modway, 1984). Additionally, and more importantly, well-trained staff that are skilled in implementing intervention can teach skills quickly which leads to faster client progress and ultimately better outcomes for the children with whom they work.

Recognizing and adopting the clinical skills initially practiced by the early founders and pioneers in the field can lead to life changing effects for individuals diagnosed with ASD. We contend that progressive, quality interventions that are rooted in the science of ABA, individualized and responsive to the learner, socially valid, and compassionate are the pathway forward in the field of ABA. We can continue to progress our field with the heart that it was intended, and the continued precision gifted by our science, but there is still much more work left to do in research and in practice.

**Footnotes**

[1]It should be stated that this list of individuals is not exhaustive of all the early pioneers employing a progressive and responsive approach to ABA. Please see Leaf, Leaf, and McEachin (2018) and O'Donohue and colleagues (2001) for more history and information on early founders of the field.

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# Erratum to: Editors' Note: Important Topics in Applied Behavior Analysis as it Relates to Autism

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## Introduction

In our recently published introduction article (i.e., Cihon et al., 2023) to a special issue of the International Electronic Journal of Elementary Education we provided an introduction and brief description of each of the articles included in the special issue. In this article we referred to an article written by Gershfeld-Litvak, which has been retracted at our request due to the use of Artificial Intelligence (AI) that led to numerous inaccuracies within the reference and the body of the paper. Below is the paragraph that was written in the original manuscript:

Original paragraph:

> *"Linnehan and colleagues begin a discussion about the contingencies leading to the development of certification and licensure within ABA as well as the resulting unintended consequences. Kazemi extends the discussion of certification and licensure to the challenges and benefits of accreditation of organizations. Gershfeld-Litvak provides a balanced discussion of the possible benefits and drawbacks of private equity entering into the field of ABA-based interventions for autistics/individuals diagnosed with ASD."*

Following the retraction, the paragraph should read as follows:

> *"Linnehan and colleagues begin a discussion about the contingencies leading to the development of certification and licensure within ABA as well as the resulting unintended consequences. Kazemi extends the discussion of certification and licensure to the challenges and benefits of accreditation of organizations."*

### Reference

Cihon, J. H., Leaf, J. B., & Kazemi, E. (2023). Editors note: Important topics in applied behavior analysis as it relates to autism. *International Electronic Journal of Elementary Education, 15*(3), 171-172. https://doi.org/10.26822/iejee.2023.289


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