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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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