

African Gender Studies Quarterly



DOI: <https://doi.org/10.69778/3106-7603/2026/2.2/EN>

EDITORIAL

Advancing the Science of Human Development in a Changing World

Human development is neither linear nor isolated. It unfolds through continuous interactions among biological processes, psychological experiences, interpersonal relationships, cultural meanings, social structures, and the environments in which individuals live. The five contributions featured in this issue of *Optimal Development* collectively reinforce this understanding, demonstrating the importance of interdisciplinary scholarship in explaining behavior, promoting wellbeing, and addressing contemporary developmental challenges.

A major strength of this issue is its attention to behavior as both a product of development and a potential target for meaningful change. The paper traces the evolution of behavioral science from Pavlov and Thorndike to B.F. Skinner and Applied Behavior Analysis (ABA) provides an important historical and conceptual foundation for understanding how behavior can be systematically studied and modified. Its application to the acquisition of two-word phrasal minds in a Nigerian child with autism demonstrates the practical value of evidence-based behavioural intervention while drawing attention to the need for cultural validation and contemporary neuro-affirming ethical practices. The emphasis on assent, dissent, and technological integration is particularly relevant to the future development of behavioural science.

The issue also examines behaviour within broader social and developmental contexts. The systematic review of adolescent sexual health demonstrates that knowledge does not automatically translate into safe sexual practices. Peer pressure, socioeconomic circumstances, family communication, cultural norms, substance use, and media exposure interact to shape adolescent sexual behaviour. This knowledge-behaviour gap highlights the need for interventions that extend beyond information provision to address the environments within which young people make decisions.

Similarly, the review of gender differences in psychopathology illustrates the complex pathways through which psychological difficulties develop across the lifespan. Although females tend to demonstrate greater vulnerability to internalizing disorders and males higher rates of externalizing difficulties, the paper appropriately cautions against deterministic interpretations. Gender interacts with biological maturation, psychological processes, and sociocultural experiences, underscoring the need for an integrative biopsychosocial-developmental framework.

Culture emerges even more explicitly in the study of Nigerian youths' understanding of Koro syndrome. Limited awareness and the influence of spiritual interpretations on

help-seeking demonstrate how cultural beliefs can shape mental health experiences and decisions about professional care. These findings call for culturally responsive mental health education that neither dismisses indigenous belief systems nor permits misinformation to obstruct appropriate care.

Finally, the exploration of the baby mama phenomenon brings family structure, stigma, psychological well-being, and social change into the conversation. The paper highlights the stress experienced by mothers, the challenges associated with social stigma, and the potential developmental implications for children growing up in diverse family arrangements. Importantly, it invites a more nuanced examination of family diversity rather than simplistic assumptions about what constitutes a successful family.

Taken together, the five contributions demonstrate that **optimal development requires more than understanding individuals in isolation**. Behaviour, Mental Health, Sexuality, Family relationships, Disability, and Cultural beliefs are embedded within social systems that can either constrain or facilitate human flourishing. The scholarship presented in this issue therefore calls for interdisciplinary, culturally grounded, developmentally sensitive, and ethically responsible approaches to research and practice.

African Gender Studies Quarterly is committed to creating a scholarly platform where diverse perspectives converge to advance knowledge of gender and human development across the lifespan. We invite researchers, practitioners, educators, policymakers, and scholars across disciplines to continue generating evidence that does not merely explain human behaviour, but contributes meaningfully to the creation of conditions in which individuals, families, and communities can flourish.

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DOI: <https://doi.org/10.69778/3106-7603/2026/2.2/a4>

**FROM PAVLOV TO SKINNER: THE EVOLUTION OF BEHAVIOURAL SCIENCE
AND ITS APPLICATION IN AUTISM SPECTRUM DISORDER**

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Abstract

This paper examines the evolution of behavioural science, tracing its development from its philosophical and experimental origins to the emergence of a technological branch, as seen in Applied Behaviour Analysis (ABA). We investigate the intellectual legacy of notable figures such as Ivan Pavlov, known for his work in classical or respondent conditioning, and Edward Thorndike, the proponent of the Law of Effect. These foundational legacies lead us to B.F. Skinner, who developed the revolutionary and comprehensive system of operant conditioning, the philosophy of radical behaviorism, and functional analysis of language as established in verbal behavior. The development outlined in this paper highlights the importance of explanatory power, functioning as an empirical framework that guides the science and its application to diverse human challenges. The four-term contingency ($MO - S^D - B - C$), which is central to this framework, is introduced as the mechanism that drives socially significant behavioral change that is measurable. To demonstrate the generality and effectiveness dimensions of this science, we provide a detailed case study on the acquisition of two-word phrasal mands (request) in Adekunle, a four-year-old functionally non-verbal Nigerian child with autism spectrum disorder (ASD). The data-informed intervention characterizing verbal behavior confirms ABA's status as an evidence-based intervention for ASD. The paper concludes with recommendations for future research that underscore the importance of global and cultural validation, technological integration, and adherence to contemporary neuro-affirming ethical practices that uphold the principles of client assent and dissent.

Keywords: Pavlov, Skinner, Behavioural Science, Autism Spectrum Disorder

Introduction

The late 19th and early 20th centuries were pivotal for the discipline of psychology as it sought to establish

itself as a legitimate science. At that time in psychology, the primary method of investigation was introspection, which relied on the subjective report provided by participants. Introspection

as a method of scientific enquiry was alien to the natural sciences (Baum, 2005). Behaviorism, a new school of thought at the time, marked a turning point in psychology, bringing with it a necessary scientific revolution (Baum, 2005).

Early scientists of the behaviorist school sought to formulate a unified set of principles that explained learning processes in different organisms, similar to the predictive validity characteristic of the physical sciences (Albert et al., 2012). Building on Pavlov's foundational work on conditioned reflexes, Edward Thorndike's postulation of the Law of Effect, and B.F. Skinner's system of learning (operant conditioning) and the philosophy of radical behaviorism (Skinner, 1974), this paper outlines a progressive expansion in the explanatory scope and practical efficacy.

Objective

This paper aims to delineate the evolution of behaviorism, from its inception in seeking to formulate a unified set of principles of learning to an applied science with direct relevance to everyday human functioning. This progression has resulted in contributions that promote improved quality of life across stages of development (child and adult populations). Furthermore, the paper will follow the emergence of Applied

Behavior Analysis (ABA) as a technological branch, tracing its origins from the formal definition found in the seminal article "*Some Current Dimensions of Applied Behavior Analysis*" by Baer, Wolf, and Risley (1968) to the pioneering work of Ivar Lovaas that demonstrated its effectiveness in treating children with autism.

In the same vein, we will look at Skinner's (1957) *Verbal Behavior*, a conceptual model for contemporary evidence-based intervention, focused on language and communication acquisition. The paper highlights the core tenets of ABA and the technological nature that distinguishes ABA as an evidence-based practice with diverse clinical applications in neurodevelopmental disabilities (Autism Spectrum Disorder, phobias, Pediatric Feeding Disorders), education, and the workplace. This will be demonstrated in a case study that illustrates the acquisition of phrasal mands in a nonverbal child diagnosed with autism spectrum disorder (ASD).

Literature Review

Pavlov's Respondent Conditioning

The systematic investigation of learning began with the Nobel laureate Ivan Pavlov. He observed that dogs in his experiment began to salivate in response to food and stimuli that preceded the presentation of food (Connors et al.,

2019). This phenomenon observed was termed as “psychic secretion” (Ferster & Skinner, 1957). The framework of Pavlov (1927) known as classical or respondent conditioning, rests on the interrelationship between the stimuli within the environment and the innate physiological responses (Baum, 2005). In this paradigm, the Unconditioned Stimulus (US) naturally evokes the Unconditioned Response (UR) (Cooper et al., 2020). When a Neutral Stimulus (NS) is consistently preceded by an Unconditioned Stimulus (US), the NS becomes a Conditioned Stimulus (CS), capable of eliciting a Conditioned Response (CR) (Cooper et al., 2020). This framework, in which a preceding stimulus (antecedents) begins to evoke reflexive behavior, is fundamental to understanding the acquisition of emotional reactions (Samra et al., 2025).

Thorndike’s Law of Effect

With Pavlov’s research focused on elicited reflexes, Edward Lee Thorndike, an American psychologist, focused on studying emitted voluntary actions (Lovaas, 1987). Using “*puzzle boxes*,” Thorndike methodically showed how the consequence of a behavior determined the likelihood of future recurrence (Michael, 1993).

In the seminal work, “*Animal Intelligence*” Thorndike (1911) postulated the Law of Effect, stating that “Of several responses made to the same situation, those which are accompanied or closely followed by satisfaction to the animal will, other things being equal, be more firmly connected with the situation, so that, when it recurs, they will be more likely to recur; those which are accompanied or closely followed by discomfort to the animal will, other things being equal, have their connections with that situation weakened, so that, when it recurs, they will be less likely to occur. The greater the satisfaction or discomfort, the greater the strengthening or weakening of the bond.” (p. 244). Establishing consequences as a controlling variable marked a shift in focus from the study of physiological processes to operant processes, thereby laying the groundwork for a science that could explain how complex behaviors are acquired and maintained (Thorndike, 1911).

Skinner’s Operant Conditioning

Thorndike’s Law of Effect served as the foundation upon which Burrhus Frederic Skinner introduced a systematic and experimental branch known as the Experimental Analysis of Behavior (EAB), with operant conditioning

as its central research theme (Skinner, 1938, 1957). Through precise measurements of behavior, Skinner analyzed the shaping, maintenance, and extinction of a behavior based on its consequences (Skinner, 1953).

By refining Thorndike's concepts, Skinner introduced a precise classification of four fundamental operant contingencies (Cooper et al. 2020). Furthermore, his work on reinforcement schedules demonstrated that the intermittent schedules of reinforcements ensured that behaviors were persistent and resistant to extinction (Ferster & Skinner, 1957; Wallace et al., 2007).

Radical Behaviorism

Skinner did not stop at the systematic refinement of behavioral principles; he also advanced a comprehensive philosophy known as *radical behaviorism* (Skinner, 1974). The term "radical" emphasizes its assertion that every observable action exhibited by an organism, and private events (thoughts and feelings), can be characterized as behavior (Thomas et al., 2010). Implicitly, the principle that internal mental states cause external behaviors autonomously is broadly rejected by this philosophical school. Instead, it proposes that both private events and observable actions are shaped by a historic interaction with

the environment (Skinner, 1953, 1974).

Applied Behavior Analysis

Introduction to ABA

Built from the learning theories, Applied Behavior Analysis (ABA) is a holistic science that systematically applies principles of behavior to the improvement of socially significant behaviors (Cooper et al., 2020). With its philosophical roots in behaviorism, ABA is an analytical branch that aims to effect measurable and positive changes in the quality of life across diverse populations and settings.

The Four-Term Contingency (MO – S^D – B - C)

The principles of Radical Behaviorism are applied in contemporary ABA through a four-term contingency (MO – S^D – B - C); the basic framework for understanding and modifying behavior (Michael, 1993). In addition to the basic stimuli, response, and consequence framework characteristic of the three-term contingency, the four-term contingency includes the Motivating Operation (MO).

The MO is an environmental factor that alters the value of a consequence and the frequency of a behavior (Michael, 1993). The addition of the MO makes motivation an observable variable that can be measured and manipulated, thereby contributing to a fuller understanding of the determinants of behavior (Cooper et al., 2020).

To define what constitutes an effective and quality implementation of ABA, Baer, Wolf, and Risley (1968) articulated seven dimensions that guide the implementation of the science (Baer et al., 1968; Cooper et al., 2020). Adherence to these dimensions ensures that interventions are scientifically valid, replicable, and significant to the social context.

The Seven Dimensions of Applied Behaviour Analysis

Dimension	Definition	Requirement
Applied	Focus on improving socially significant behaviors (Baer et al., 1968).	Interventions must address behaviors that matter to the individual's independence and quality of life.
Behavioral	The behavior targeted must be observable, measurable, and precisely defined (Baer et al., 1968).	Requires objective recording and reliable data collection.
Analytic	Must demonstrate a clear functional relationship between the intervention and the behavior change (Baer et al., 1968).	Uses experimental control (e.g., multiple-probe designs) to establish causality.
Technological	Procedures must be described with sufficient clarity for replication (Baer et al., 1968).	Ensures reproducibility across practitioners and settings.

Conceptually Systematic	Interventions must be explicitly linked to the basic principles of behavior analysis (Baer et al., 1968).	Grounds practical techniques in scientific theory (e.g., reinforcement, extinction).
Effective	Intervention must produce socially meaningful, durable, and clinically significant behavior change (Baer et al., 1968).	Focuses on outcomes that make a practical difference.
Generality	Behavior change must be maintained over time and appear in untrained environments (Baer et al., 1968).	Ensures lasting, transferable success.

Application of ABA Across Diverse Settings

The principles of behavior are universal, which encourages its successful application various domains (clinical, educational and organizational).

Education (Classroom Management and Instructional Design)

Applied Behavior Analysis (ABA) strategies are a mainstay within the educational setting. They are employed to improve instructional methods and to effectively manage in-class student behavior (Skinner, 1953). Standing on the existing foundation of Skinner's model of programmed instruction,

educational systems have emphasized a form of *learning by doing*, rather than the passive acquisition of knowledge. A notable instructional framework is Keller's Personalized System of Instruction (PSI), employed with students in higher education (Martens et al., 2021). The PSI framework prioritizes flexibility, as it affords students autonomy to determine the pace of attending lectures and studying. Though flexible, academic standards are maintained. Each instructional units are followed by a brief assessment. The instructors are required to present the performance of

each student on each instructional unit on a graph. Mastery of the teaching resource from each unit is required before advancement to subsequent units (Martens et al., 2021).

- **Discrete Trial Teaching (DTT):** The DTT is a structured instructional method that involves breaking down complex skills into smaller teachable steps that are taught through repeated trials (Lovaas, 1987). Implementing this instructional method with high fidelity is essential for significant behavioral change (Lead et al., 2012; Wang et al., 2023).
- **Pivotal Response Training (PRT):** The PRT is a naturalistic instructional method that focuses on key “pivotal” areas, such as motivation, leading to generalized improvement seen across domains of development (Wang et al., 2023). Empirical evidence from a randomized controlled trial indicates that

embedding the motivational component of the PRT during intervention will lead to substantial progress in both the targeted verbal behavior operant and associated social and cognitive domains with children with autism (Wang et al., 2023).

- **Token Economy:** The token economy is a system of reinforcement where students earn conditioned reinforcers (tokens or points) for the exhibition of desirable behavior. These tokens can be exchanged for “backup reinforcers” (toys, edibles, or activities) that are valuable to the individual (Harvey et al., 2009).

Organizational Behavior Management (OBM)

OBM is a sub-domain of ABA in which the principles of behavior are applied to promote an increase in employee performance and workplace culture (Hall, 1980).

- **Performance Management (PM):**

This area of OBM ensures that employee actions are in line with organizational goals (Novak et al., 2019). PM features evidence-based components such as initial preservice training and ongoing staff support through continuous coaching and objective feedback, for the purpose of ensuring high fidelity of service delivery (Novak et al., 2019). As an analytical branch, OBM makes data-informed decisions in areas such as performance improvement, safety, and overall organizational effectiveness, as well as addressing behavior-based challenges within organizations (Novak et al., 2019).

Specialty Clinical Applications

Contingency management for Substance Use Disorders

Contingency management (CM) is founded on the principles of operant conditioning and exemplifies a systematic

application of behavioral principles to the treatment of substance use disorders (SUDs) (Petry, 2012; Silverman & Heli, 2008). Within this framework, a system of reinforcement is observed through the delivery of monetary-based reinforcers, hinging on validly submitted drug-negative samples (Petry, 2012; Silverman & Heli, 2008). In-depth empirical evidence highlights that CM leads to substantial short-term progress in the reduction of substance use, with longitudinal data suggesting a sustained decrease in individuals who received intervention when compared to patients who did not receive the intervention (Petry, 2012).

Behavioral Treatment of Pediatric Feeding Disorders

When food refusal is maintained by means of escape contingencies, ABA is implemented as a primary approach to intervention in the treatment of Pediatric Feeding Disorders (O'Malley et al., 2017). ABA intervention commences after all

medical and physiological conditions causing feeding difficulty have been managed (Samra et al., 2025). Behaviors such as spitting and gagging function as Negative Reinforcements (S^R), as engaging in these refusal behaviors leads to the removal of aversive stimulus (in this case, food) or the termination of feeding activity (O'Malley et al., 2017). Intervention often involves exploiting the motivating operation of hunger (increasing the reinforcing value of food through hunger) while simultaneously implementing other behavioral strategies such as escape extinction, differential reinforcement, and shaping, leading to food acceptance behavior (O'Malley et al., 2017).

Phobia and Anxiety Disorders

Treatment of specific phobia often involves the application of both respondent and operant principles. Phobia is initially acquired through classical conditioning (similar to that in little Albert) but maintained by

behaviors that serve as negative reinforcement, where the avoidance prevents exposure to the feared stimulus (Samra et al., 2025). Exposure-based interventions (*in vivo and systematic desensitization*) are the core treatments implemented to drive behavior change (interrupting the cycle of avoidance and fear (Hendriks et al., 2008; Samra et al., 2025). The methodological foundation of this intervention integrates extinction procedures by presenting the feared stimulus without the emergence of a negative outcome and promotes habituation (repeated exposure leading to the reduction of physiological responses) (Hendriks et al., 2008; Samra et al., 2025). We should note that Cognitive-Behavioral Therapy (CBT) incorporates these treatments and is effective in reducing phobia and comorbid symptoms of anxiety and depression when compared to control conditions (Hendriks et al., 2008).

Self-Management and Personal Goal Setting

Applied Behavior Analysis (ABA) serves as a model for teaching individuals to manage and regulate their own behavior through self-initiated cues and strategies (Marchall & Rohrer, 2023; Skinner, 1953). The implementation of self-management interventions is essential for ensuring that skills are generalized and maintained, while promoting independence, with no external supports (Koegel et al., 1992). The components associated with these interventions include goal setting (using SMART criteria), Self-Monitoring (systematic recording of behavior), self-evaluation (analyzing current performance in relation to established goals), and self-reinforcement (delivery of reward for achieving goals) (Cooper et al., 2019; Marchall & Rohrer, 2023).

Early Intensive Behavioral Intervention (EIBI)

Ivar Lovaas

Within behavioral science, Early Intensive Behavioral Intervention (EIBI) holds the position as the

most empirically authenticated and influential for ASD treatment. Ivar Lovaas (1987) demonstrated that intensive, early, individualized behavioral intervention delivered for over 40 hours per week produced significant improvement in both intellectual and adaptive domains of young children with ASD (Lovaas, 1987).

This landmark study has elevated ABA to the status of “gold standard” in the area of autism intervention (Smith, 2012). This status is recognized by major governmental and professional bodies:

- Based on a 30-year of research, **the U.S. Surgeon General’s 1999 Report on Mental Health** confirmed the efficacy of the applied science to reducing inappropriate behavior, increasing communication, promoting learning, and developing social behavior (U.S. Department of Health and Human Services, 1999).
- ABA was conferred with its status as an evidence-based practice (EBP) for ASD

by the American Psychological Association (APA), the National Institute of Mental Health (NIMH), and the Centers for Disease Control (CDC) (Hagopian et al., 2015; Smith, 2012).

Efficacy Data from Systematic Reviews

Evidence substantiating the effectiveness of ABA is found in systematic reviews and meta-analyses:

- In a meta-analysis of 14 randomized trials consisting of 555 participants, significant improvements in expressive language, communication, and social behavior were observed for children in a comprehensive ABA program (Motiwala et al., 2020).
- Using a Cochrane systematic review, it was reported that the implementation of EIBI rooted in ABA principles was associated with improvements in

adaptive behavior, IQ, and expressive and receptive language with children with ASD. However, the authors rated the evidence presented in the review low to very low due to methodological limitations (Reichow et al., 2018).

- A comparative analysis of intervention outcomes for individuals with developmental disabilities revealed that programs utilizing ABA showed improvements in autism-related behavioral outcomes in the areas of problem behavior and symptom severity (Nolan et al., 2022). These improvements can be attributed to the systematic use of Functional Behavior Assessments (FBA) that identify and modify environmental variables that maintain the behavior (Cooper et al., 2020).

Comprehensive Overview of verbal Behavior

An Analysis of Language: Skinner's Verbal Behavior

Skinner extended his analysis of operant to the domain of human language in his work titled *Verbal Behavior* (1957). For Skinner, language is “behavior reinforced through the mediation of other persons needs...” (p. 2). Therefore, in relation to a structural analysis, language should be studied in relation to its function and the environmental contingencies

(antecedents and consequences) that maintain it (Sautter & Leblanc, 2006). The functional analysis expands the study of language into a set of verbal operants, each with its own controlling contingencies (DeSouza et al., 2017).

1.1. The Six Elementary Verbal Operants

Skinner (1957) identified six primary elementary verbal operants, which form the basis of communication intervention (DeSouza et al., 2017).

Verbal Operant	Functional Definition	Controlling Antecedent Variable	Required Correspondence
Mand	A request or command.	Motivating Operation (MO) (a state of need or desire).	None (Response does not match stimulus).
Tact	Labeling or naming something sensed in the environment.	Non-verbal stimulus (e.g., seeing an object).	None.
Echoic	Repeating or imitating another person's vocal response.	Verbal stimulus (auditory/spoken).	Point-to-Point Correspondence (PPC) and Formal Similarity.
Intraverbal	A conversational response to another	Verbal stimulus (auditory/spoken)	None (No PPC).

	person's verbal behavior.	n) that is not echoed.	
Textual	Reading written words aloud.	Non-verbal stimulus (written text).	PPC (Written word matches spoken word).
Transcription	Writing or spelling based on auditory or visual cues (dictation or copying).	Verbal stimulus (auditory dictation) or non-verbal stimulus (written model).	PPC (Spoken/Written word matches written output).

Case Study

This case study illustrates behavioural principles through an example demonstrating how the four-term contingency and verbal behaviour procedures are used to teach functional communication to a non-verbal child with ASD.

Participant Profile and Target Behavior

Adekunle, aged 4 years and 2 months, residing in Lagos, Nigeria, had received a formal diagnosis of autism spectrum disorder, with specifiers indicating a requirement for Level 2 (requiring substantial support) support and accompanying intellectual and language impairment. Adekunle's baseline skills included functional non-verbal

skills such as taking an adult by the hand and leading them to a desired item. When his requests were not immediately met, he would cry loudly, drop to the floor, and engage in mild self-injury (slapping his head). His verbal skills were limited to a small number of single-syllabic vowel sounds, which he could occasionally imitate upon request (limited echoic repertoire), and there was no history of using spontaneous vocalizations to request items or activities.

The intervention was individualized and occurred within a clinical setting with a trained behavior therapist. The primary target behavior for this intervention was the independent emission of two-

word phrasal mands. A phrasal mand in this study is defined as a vocal utterance of 2 or more words that specify a desired item or action (e.g., "want ball," "open door," "more bubbles," "help please"). A mand was scored as independent if it was emitted independently (without any immediately preceding echoic prompt or direct verbal cue from the therapist) when the motivating operation (MO) and discriminative stimulus (S^D , the item itself or a context requiring help) were presented. The primary method of measurement was the frequency of independent two-word phrasal mands recorded during a 30-minute observation period each session. Data was also collected on the frequency of prompted mands to monitor the efficacy of prompt fading procedures.

Procedure

To assess the functional relationship between the intervention and the acquisition of two-word phrasal mands, a multiple-probe single-case experimental design across baseline and intervention phases was utilized.

Baseline: Data were collected across five intervals of 30-minute each, which established

the pre-intervention rate of independent mands as stable and near zero (mean of 0.4 per session).

Intervention: Intervention was based on the principles of verbal behavior (Albert et al., 2012; Skinner, 1957; Wallace et al., 2007), implemented through intensive mand training. The procedure followed the four-term contingency:

- **Contrive Motivation (MO):** The effectiveness of the intervention was dependent on a strong MO established through deprivation or restricted access that led to Adekunle's strong desire for the item or activity (Alber et al., 2012). For example, the therapist would show Adekunle a clear, latched box containing a highly preferred light-up spinning toy. Adekunle's repeated attempts to open the box himself confirmed the MO had been established.
- **Present Antecedent (S^D):** The presence of the box or the box being

held in front of Adekunle served as a clear opportunity to mand.

- **Prompt Behavior (B):** Initially, the therapist will provide support by using an echoic prompt immediately after presenting the *S^D*.
Therapist: “Say open box” (Albert et al., 2012).
- **Reinforce**
Consequence (C): Reinforcement was provided for vocal approximations of the target phrase Adekunle made (e.g., “o-bah”) by the therapist giving access to the child (opening the box) while delivering enthusiastic social praise (e.g., “Great asking! ‘Open box!’”) (Fisher et al., 2010). The timing in the delivery of the reinforcement and specific reinforcement provided is necessary for making strong connections between the vocal response of the child (vocal approximation “o-bah”) and the desired outcome (opening the

box) (Albert et al., 2012).

- **Prompt fading:** The echoic prompts utilized by the behavior therapist were gradually faded to transfer control from the therapist’s vocal model to Adekunle’s own motivation (Albert et al., 2012). The prompt fading strategy used was a most to least fading technique, starting with a full echoic (“Say ‘open box’”) to a partial echoic (“Open...”), to a phonemic cue (“/o/”), to a simple expectant look paired with withholding the item. Adekunle was placed on a differential reinforcement schedule as independent responses led to immediate access and more enthusiastic praise (Thomas et al., 2010). Strategies were consistently utilized within trials across multiple sessions with a variety of reinforcers to promote generalization of requesting skill.

Results and Analysis

The intervention resulted in a rapid and significant acquisition of independent two-word phrasal mands. During the five baseline sessions, Adekunle's rate of independent two-word phrasal mands was stable and near

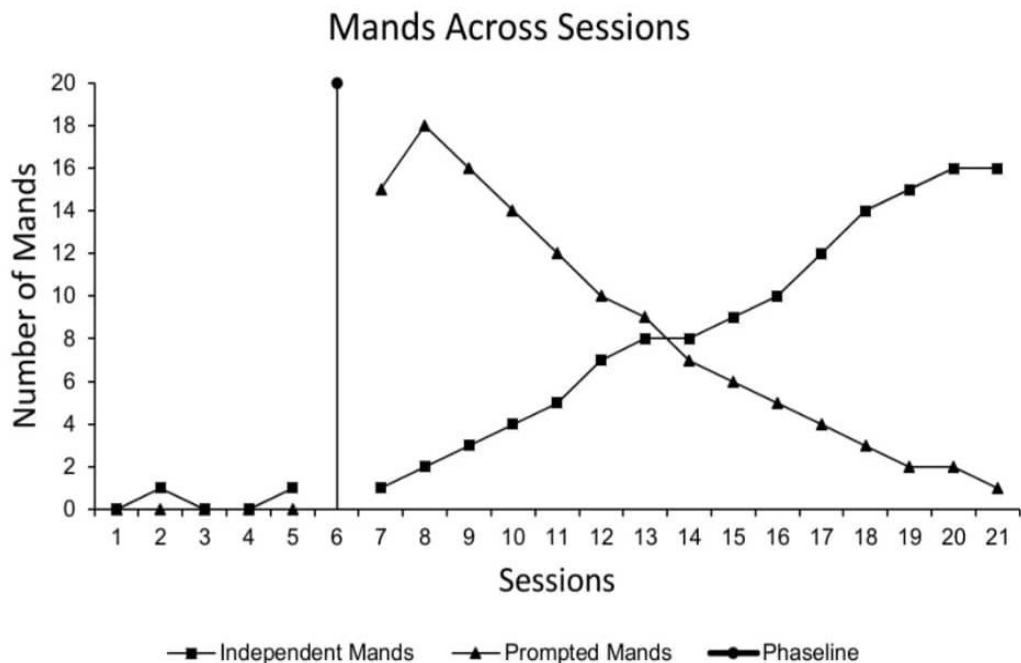
zero, with a mean of 0.4 per session (range: 0-1). Upon the introduction of the intervention, prompted mands were initially high and then decreased as independent mands systematically increased, demonstrating a successful transfer of stimulus control.

Table 1: Frequency of Independent and Prompted Two-Word Phrasal Mands Across Baseline and Intervention Phases for Adekunle

Session	Date	Phase	Independent M	Prompted Mand	Phaseline
1	04-Oct-23	Baseline	0	0	20
2	05-Oct-23	Baseline	1	0	
3	06-Oct-23	Baseline	0	0	
4	09-Oct-23	Baseline	0	0	
5	10-Oct-23	Baseline	1	0	
6	11-Oct-23	Intervention	1	15	
7	12-Oct-23	Intervention	2	18	
8	13-Oct-23	Intervention	3	16	
9	16-Oct-23	Intervention	4	14	
10	17-Oct-23	Intervention	5	12	
11	18-Oct-23	Intervention	7	10	
12	19-Oct-23	Intervention	8	9	
13	20-Oct-23	Intervention	8	7	
14	23-Oct-23	Intervention	9	6	
15	24-Oct-23	Intervention	10	5	
16	25-Oct-23	Intervention	12	4	
17	26-Oct-23	Intervention	14	3	
18	27-Oct-23	Intervention	15	2	
19	30-Oct-23	Intervention	16	2	
20	31-Oct-23	Intervention	16	1	

In the baseline phase, Adekunle's rate of independent two-word phrasal mands was stable and near zero, with a mean of 0.4 per session (range: 0-1). This shows that prior to intervention he had not yet acquired the target skill and with the acquisition of the skill unlikely to occur without intervention. A clear

trend emerged in the intervention phase. Prompted mands were initially high and then decreased as independent mands systematically increased, demonstrating a successful transfer of stimulus control from the therapist's prompt to Adekunle's own motivating operations.



This case study provides a clear, data-based demonstration of how the principles of verbal behavior and, by extension, modern-day application of behavioral principles can be applied to systematically teach functional communication skills to a previously non-verbal child with autism (Thomas et al., 2010).

Recommendations and Conclusion

Ethical Imperatives and Future Direction

The future of ABA depends on rigorous ethical adherence and continuous innovation.

- **Ethical Practice:** Practitioners are mandated to adhere to core ethical principles (beneficence, informed consent) and are rigorously required to avoid aversive practices (Behavior Analyst Certification Board, 2020). Contemporary ethical practice requires explicit recognition of the client's right to **assent** and **dissent/assent withdrawal** (Breaux & Smith, 2023). Behaviors previously labeled as "escape-maintained problem behavior" must be re-evaluated and honored as potential, non-verbal expressions of assent withdrawal, requiring the practitioner to adjust the

procedure immediately (Breaux & Smith, 2023).

- **Research Directions:** Future research should focus on validating the adaptation of ABA principles across globally diverse cultural and societal contexts (Connors et al., 2019). Research in specific regions, such as Nigeria, should focus on establishing foundational data, including assessing the current workforce capacity, the number of clinicians using ABA and other evidence-based interventions, and identifying critical implementation modalities like treatment fidelity and necessary local adaptations. Furthermore, it is essential to investigate the social validity of different forms of reinforcers compared to Western populations for clinical applications and Organizational Behavior Management (OBM) for psychologists interested in applying ABA principles to workplace performance measures. Furthermore, research should leverage technology (e.g., Virtual Reality for exposure therapy) and utilize neuroimaging to validate the functional mechanisms of behavior

change at a biological level (Behavior Analysis and Behavioral Neuroscience, 2015). The paper has further justify the findings of (Akinwale & Olayiwola, 2025) on the effectiveness of Applied Behaviour Analysis in the management of children on the ASD. Policy-relevant studies utilizing prospective designs that rigorously compare ABA with non-ABA interventions are essential for guiding informed decision-making regarding resource allocation (Warren et al., 2011).

Conclusion

The intellectual and scientific journey, starting from Pavlov's (1927) foundational methodology and Thorndike's (1911) identification of the consequence's crucial role, culminated in B.F. Skinner's (1938, 1957) comprehensive science of operant conditioning and Radical Behaviorism (Baum, 2005; Skinner, 1974). This rigorous evolution provided the empirical bedrock

for the technology of Applied Behavior Analysis (ABA). The profound legacy of this science is powerfully realized in its application, most notably through O. Ivar Lovaas's (1987) pioneering work, which demonstrated that intensive behavioral intervention could produce long-term, positive changes in the lives of children with autism (Rogers & Vismara, 2008).

The paper's findings confirm this enduring practical power: the successful, data-based acquisition of two-word phrasal mands (requests), as observed in the case study of Adekunle, illustrates the direct, transformative impact of ABA. This outcome not only validates ABA as an evidence-based intervention for non-verbal children with autism but also underscores the necessity for cultural and global adaptation of these principles to improve the quality of life across diverse international settings.

References

- Albert, K. M., Carbone, V. J., Murray, D. D., Hagerty, M., & Sweeney-Kerwin, E. J. (2012). Using an interrupted chain procedure to teach mands for missing items. *Journal of Applied Behavior Analysis*, 45(3), 619–624. <https://doi.org/10.1901/jaba.2012.45-619>

- Akinwale, G. A., & Olayiwola, T. B. (2025). A review of the effectiveness of ABA-based interventions in managing children with Autistic Spectrum Disorder. *International Journal of Studies in Inclusive Education*, 2(3), 30–38. Retrieved from <https://www.ajol.info/index.php/ijisie/article/view/311968>.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1(1), 91–97.
- Baum, W. M. (2005). *Understanding behaviorism: Behavior, culture, and evolution* (2nd ed.). Blackwell.
- Behavior Analyst Certification Board. (2020). *Ethics code for behavior analysts*. (<https://www.bacb.com/wp-content/uploads/2022/01/Ethics-Code-for-Behavior-Analysts-220316-2.pdf>)
- Behavior Analysis and Behavioral Neuroscience. (2015). *Frontiers in Human Neuroscience*, 9(210). <https://doi.org/10.3389/fnhum.2015.00210>
- Breaux, E. M., & Smith, C. (2023). Assent in applied behaviour analysis and positive behaviour support: Ethical considerations and practical recommendations. *Behavior Analysis in Practice*, 16(3), 856–866. <https://doi.org/10.1007/s40617-023-00780-6>
- Connors, B. M., Johnson, A., Duarte, J., Murri, M., & Capell, S. (2019). Future directions of training and fieldwork in diversity issues in applied behavior analysis. *Behavior Analysis in Practice*, 13, 150–164. <https://doi.org/10.1007/s40617-019-00379-1>
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2019). *Applied behavior analysis* (3rd ed.). Pearson.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). *Applied behavior analysis* (3rd ed.). Pearson.
- DeSouza, A. A., Akers, J. S., & Fisher, W. W. (2017). Empirical application of Skinner's verbal behavior to interventions for children with autism: A review. *The Analysis of Verbal Behavior*, 33(2), 229–259. <https://doi.org/10.1007/s40616-017-0093-7>
- Ferster, C. B., & Skinner, B. F. (1957). *Schedules of reinforcement*. Appleton-Century-Crofts.

- Fisher, W. W., Piazza, C. C., Bowman, L. G., & Hanley, G. P. (2010). A training program for teaching staff to conduct mand training. *Journal of Applied Behavior Analysis*, 43(4), 721–728. <https://doi.org/10.1901/jaba.2010.43-721>
- Hagopian, L. P., Hardesty, S. L., & Gregory, M. (2015, September). *Overview and summary of scientific support for applied behavior analysis*. The Kennedy Krieger Institute and Johns Hopkins University School of Medicine. <https://www.kennedykrieger.org/sites/default/files/library/documents/patient-care/centers-and-programs/down-syndrome-clinic-and-research-center/aba-scientific-support-9-2015.pdf>
- Hall, R. V. (1980). A behavioral approach to organizational behavior: Organizational behavior management. *Journal of Organizational Behavior Management*, 2(3), 185–189.
- Harvey, M. T., Luiselli, J. K., & Wong, S. E. (2009). Application of applied behavior analysis to mental health issues. *Psychological Services*, 6(3), 212–222.
- Hendriks, T., Oude Voshaar, R. C., Keijsers, G. P. J., van Eijkeren, M., Kluin, H., & van den Heuvel, O. A. (2008). The clinical effectiveness of cognitive-behavioral therapy for anxiety disorders in the elderly: A meta-analysis. *Journal of Anxiety Disorders*, 22(4), 868–876. <https://doi.org/10.1016/j.janxdis.2007.08.006>
- Koegel, R. L., Frea, W. D., & Surrat, A. (1992). Two-week evaluation of a training program for mothers of children with autism. *Journal of Applied Behavior Analysis*, 25(1), 1–15. <https://doi.org/10.1901/jaba.1992.25-1>
- Leaf, J. B., Leaf, R., Taubman, M., McEachin, J. J., & Smith, T. (2012). The comparative effects of discrete trial training and natural environment training on the acquisition of mands. *The Journal of Speech and Language Pathology – Applied Behavior Analysis*, 7(1), 22–32.
- Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, 55(1), 3–9. <https://doi.org/10.1037/0022-006X.55.1.3>
- Martens, B. K., Daly, E. J., III, Begeny, J. C., & Sullivan, W. E. (2021). Behavioral approaches to education. In W. W. Fisher, C. C. Piazza, & H. S. Roane (Eds.), *Handbook of Applied Behavior Analysis* (2nd ed., pp. 445). The Guilford Press.
- Marshall, K. B., & Rohrer, J. L. (2023). Self-Management Interventions: A treatment summary. *Science in Autism Treatment*, 20(02).

- Michael, J. (1993). Establishing operations. *The Behavior Analyst*, 16(2), 191–206. (<https://doi.org/10.1007/BF03392623>)
- Motiwalla, M., Zukowski, J., & Shah, M. (2020). Effectiveness of interventions based on applied behavior analysis for children with autism: A meta-analysis. *Current Medical Research and Opinion*, 36(10), 1641-1649. <https://doi.org/10.1080/03007995.2020.1805719>
- Nolan, A., DiGennaro Reed, F. D., & Rehfeldt, R. A. (2022). The effectiveness of behavioral interventions for children with intellectual and developmental disabilities (IDD): A systematic review. *International Journal of Developmental Disabilities*, 68(6), 619–631. <https://doi.org/10.1080/20473869.2020.1741548>
- Novak, M. D., DiGennaro Reed, F. D., Erath, T. G., Blackman, A. L., Ruby, S. A., & Pellegrino, A. J. (2019). Evidence-Based Performance Management: Applying Behavioral Science to Support Practitioners. *Perspectives on Behavior Science*, 42(4), 955–972. <https://doi.org/10.1007/s40614-019-00232-z>
- O'Malley, J., Tapp, J., & LeBlanc, L. A. (2017). Behavioral treatments for pediatric feeding disorders: A systematic review. *International Journal of Developmental Disabilities*, 63(1), 1-13. <https://doi.org/10.1080/20473869.2016.1243179>
- Pavlov, I. P. (1927). *Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex* (G. V. Anrep, Trans.). Oxford University Press.
- Petry, N. M. (2012). Contingency management treatment for substance use disorders: How far has it come and where does it need to go. *Addiction*, 107(6), 1184–1187. <https://doi.org/10.1111/j.1360-0443.2012.03799.x>
- Reichow, B., Hume, K., Barton, E. E., & Boyd, B. A. (2018). *Early intensive behavioral intervention (EIBI) for increasing functional behaviours and skills in young children with autism spectrum disorder*. *Cochrane Database of Systematic Reviews*, 2018(5), CD009260. <https://doi.org/10.1002/14651858.CD009260.pub3>
- Rogers, S. J., & Vismara, L. A. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child & Adolescent Psychology*, 37(1), 8–38. <https://doi.org/10.1080/15374410701817808>
- Samra, C. K., Torrico, T. J., & Abdijadid, S. (2025). Specific phobia. In *StatPearls [Internet]*. StatPearls Publishing.

- Sautter, R. A., & Leblanc, L. A. (2006). Empirical applications of Skinner's analysis of verbal behavior with humans. *The Analysis of Verbal Behavior*, 22(1), 35–48. (<https://doi.org/10.1007/BF03393025>)
- Silverman, K., & Heil, S. H. (2008). Contingency management treatment for substance use disorders. *Science & Practice*, 3(2), 52–61.
- Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. Appleton-Century-Crofts.
- Skinner, B. F. (1953). *Science and human behavior*. Macmillan.
- Skinner, B. F. (1957). *Verbal behavior*. Appleton-Century-Crofts.
- Skinner, B. F. (1974). *About behaviorism*. Knopf.
- Smith, T. (2012). Applied behavior analysis (ABA) as a treatment for autism spectrum disorder. *Journal of Behavior Analysis of Offender and Victim: Treatment and Prevention*, 5(2), 58–71.
- Thomas, B. R., Lafasakis, M., & Sturmey, P. (2010). The effects of prompting, fading, and differential reinforcement on vocal mands in non-verbal preschool children with autism spectrum disorders. *Behavioral Interventions*, 25(2), 157–168. <https://doi.org/10.1002/bin.300>
- Thorndike, E. L. (1911). *Animal intelligence: Experimental studies*. Macmillan.
- Thorndike, E. L. (1911). Chapter V: Laws and hypotheses for behavior; laws of behavior in general. In *Animal intelligence: Experimental studies*. Classics in the History of Psychology. <https://psychclassics.yorku.ca/Thorndike/Animal/chap5.htm>
- U.S. Department of Health and Human Services. (1999). *Mental health: A report of the Surgeon General*. U.S. Public Health Service.
- Wallace, M. D., Iwata, B. A., & Hanley, G. P. (2007). A comprehensive analysis of mand training. *The Journal of Speech and Language Pathology – Applied Behavior Analysis*, 2(3), 278–286. <https://doi.org/10.1037/h0100225>
- Wang, L., Li, S., & Wang, C. (2023). Using Pivotal Response Treatment to improve language functions of autistic children in special schools: A randomized controlled trial. *Journal of Autism and Developmental Disorders*, 53(8), 3568–3581. <https://doi.org/10.1007/s10803-023-05988-7>

Warren, Z., Veenstra-VanderWeele, J., Stone, W., Bruzek, J. L., Nahmias, A. S., et al. (2011). *Therapies for children with autism spectrum disorders*. Agency for Healthcare Research and Quality (US). (