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AUTISM SPECTRUM (A RICHDALE, SECTION EDITOR)

The Efficacy of ABA for Individuals with Autism Across the Lifespan

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Abstract The use of applied behavior analysis (ABA) across the lifespan for individuals with autism spectrum disorders (ASD) evolves as young children mature to adolescents and then to adults. In childhood, instruction of comprehensive skill repertoires in combined treatment packages (e.g., early intensive behavioral intervention) in conjunction with instruction of individual functional skills related to communication, social skill interactions, and adaptive behavior create a comprehensive program. As children mature to adolescents and adults, instruction focuses more on individual functional skills related to adaptive behavior (e.g., vocational, personal/domestic, community, and leisure). Both combined treatment packages and individual functional skill instruction for children and adolescents rely upon the research-supported operant principles and procedures of ABA. Thus, ABA can be considered an efficacious treatment option for individuals with ASD across the lifespan if used with fidelity to the application of ABA principles.

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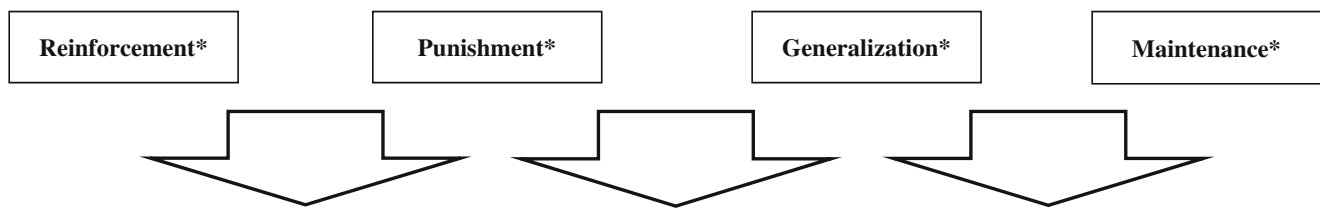
Introduction

The discipline of applied behavior analysis (ABA) provides a comprehensive approach to understanding and improving human behavior. Built upon the scientific foundation of experimental analysis and refined by decades of applied research [1], behavior analysts create programs derived from basic learning principles (e.g., reinforcement) to promote the development of functional skills or to reduce challenging behaviors. Although behavior analysts employ many basic learning principles to improve socially important behavior, most improve skills using the principles of operant learning (i.e., an increase or decrease in future occurrences of the behavior as a function of consequences).
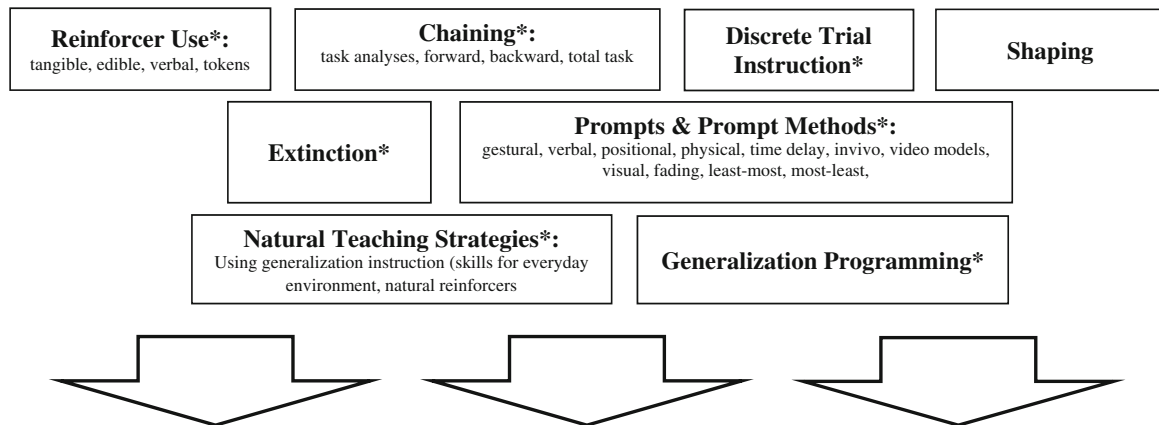
Operant learning principles include a variety of well-researched concepts. These operant learning principles (e.g., reinforcement, generalization, and stimulus control) contribute to the development of conceptually based operant procedures [1]. Because research-supported operant learning principles provide the foundation for operant procedures, each of the operant procedures can be considered conceptually effective for teaching a variety of skills. In addition to the efficacy of the underlying principles providing the foundation for operant procedures, research evaluating the efficacy of individual operant procedures (e.g., the application of reinforcement to improve a specific skill) indicates additional support (see Fig. 1 for examples of operant learning principles and the operant procedures developed from the principles).

Although research supports each of these individual operant procedures, the implementation of an operant procedure in isolation rarely produces optimal learning of functional skills. When constructing behavior change programs, behavior analysts combine the individual

Example Operant Principles

| Reinforcement* | Punishment* | Generalization* | Maintenance* |

Example Operant Procedures[1]

Reinforcer Use*: tangible, edible, verbal, tokens

Chaining*: task analyses, forward, backward, total task

Discrete Trial Instruction*

Shaping

Extinction*

Prompts & Prompt Methods*: gestural, verbal, positional, physical, time delay, invivo, video models, visual, fading, least-most, most-least,

Natural Teaching Strategies*: Using generalization instruction (skills for everyday environment, natural reinforcers

Generalization Programming*

Example ABA Combined Packages

Comprehensive Behavioral Treatment*: Applied Behavior Analysis, Early Intensive Behavioral Interventions, "Lovaas Programs", UCLA Model

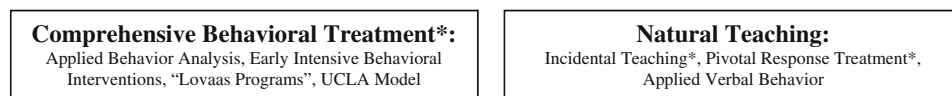**Natural Teaching:** Incidental Teaching*, Pivotal Response Treatment*, Applied Verbal Behavior

Fig. 1 Graphical representation of the influence of operant principles on procedures and combined packages. *Asterisk* indicates determined to be supported by research. *1* see reference [47] pp. 213–214 for other examples of operant procedures developed from operant principles

operant procedures to create effective and comprehensive programming. For example, behavior analysts combine research-supported prompting and prompt fading procedures with reinforcement procedures. When behavior analysts develop specific combinations of operant procedures to teach functional skills, they may disseminate the combined procedures as a packaged treatment approach. For example, repeated presentation of idiosyncratic combinations of specific antecedent manipulation, prompting procedures, generalization and maintenance protocols, and reinforcement may be labeled as a specific packaged treatment approach (e.g., natural environmental training, applied verbal behavior, early intensive behavioral intervention, and pivotal response treatment) [2].

Within these packaged treatment approaches, idiosyncratic combinations and implementation of operant principles and procedures sometimes occur; such procedures may not follow ABA application standards. The conventional practices and idiosyncratic implementations that develop within these packaged approaches typically do not suggest any new principles of learning nor show superiority to their individual research-supported

operant procedure foundations. See Fig. 1 for examples of combined treatment packages developed from operant procedures.

The packaging of operant procedures also may cause confusion when attempting to evaluate the efficacy of the treatment package and underlying equivalencies to their underlying research-supported operant procedures [3••, 4••]. Behavior analysts and supporters of these packaged treatment approaches sometimes make anecdotal claims that the packaged combinations of operant procedures within the treatments maintain quantitatively and qualitatively different outcomes than the individual operant procedures. In fact, the idiosyncratic combinations and implementations of operant procedures developed within the packaged treatments may not follow research-supported ABA standards. For example, choosing targeted skills listed in a packaged curriculum that the person being treated will never use in his or her natural environment violates basic operant principles and procedures of target selection, generalization, and maintenance. Thus, although the packaged treatment may be developed from operant principles and procedures, the packaged treatment may not be supported because

the treatment does not follow ABA application, generalization, and maintenance standards.

These packaged treatments may become marketed without adequate examination of the effects of the packaged idiosyncratic procedures [3••]. It is important to note that packaging and labeling a combination of operant procedures does not create inherent problems and should not necessarily be avoided [3••]. However, problems in determining the efficacy of ABA interventions develop because evaluators may tend to investigate the efficacy of only the packaged treatments and their idiosyncratic application of ABA.

Practitioners debate the efficacy of ABA for people with autism spectrum disorders (ASD) due in part to what they consider ABA to be. Some evaluators of ABA strictly adhere to the investigation of the efficacy of operant principles and procedures for increasing functional skill acquisition. Other evaluators only examine ABA within the packaged treatment approaches, sometimes even creating their own package names (e.g., "Lovaas approach," "mass trial approach," etc.). The different approaches to determine treatment efficacy leads to varying determinations of the research support for ABA. This can be very confusing to consumers and professionals attempting to determine if they should use ABA to help people with ASD.

Despite the inherent difficulties with determining how to evaluate ABA, researchers require certain common standards for evaluating treatment efficacy. These evaluation standards typically require the examination of empirical research for quality scientific methodology and replication of results across studies [5–8, 9•, 10]. These standards result in research-efficacy determinations for the marketed, packaged treatments or for just specific combinations of operant procedures [4••]. For example, pivotal response treatment (i.e., a combined ABA package) and the combination of most to least prompting and edible reinforcement (i.e., a combination of specific operant procedures) may be considered efficacious while most to least prompting without reinforcement may not. However, researchers also suggest that individual operant procedures based upon research-supported operant principles can be considered efficacious for people with ASD [10].

Decades of applied research that includes the empirical evaluation of operant principles, operant procedures, and combined packaged treatments indicate that a variety of operant procedures may be considered effective for teaching skills for people with ASD. An inclusive search of *all* articles addressing teaching people with ASD reveals thousands of articles that use operant procedures. Thus, a comprehensive literature review of *all* research involving ABA for teaching skills and reducing behavior for people with ASD across the lifespan would be beyond the scope of this article. This literature review provides readers with research-supported *examples* of instruction of skills across the lifespan for people with ASD (i.e., early intervention/elementary school and adolescent/adult) using operant principles and procedures.

Early intervention/elementary school

Historically, behavior analysts used operant procedures to teach specific, individual functional skills to children. These skills often included very discrete skills, such as hand washing, teeth brushing, and sitting in a chair. Evaluation of these operant procedures indicates efficacy for teaching specific skills to children with ASD [4••, 8]. See Fig. 1 for examples of operant procedures considered research-supported for use with children with ASD.

Following Lovaas's [11, 12] seminal results, behavior analysts continued to teach children with ASD individual functional skills. However, they expanded treatment to teaching multiple skills within the same conceptual category or comprehensive skill repertoire (e.g., imitation, matching, requesting, etc.). This change in instructional focus resulted in the development of combined treatment packages (e.g., ABA, early intensive behavioral interventions, and comprehensive behavioral treatments) to instruct a combination of individual functional skills and comprehensive skill repertoires.

As instructional focus evolved from teaching individual skills to teaching comprehensive skill repertoires and combined behavioral packages focusing on developmental sequencing of skills, the evaluation of ABA's effectiveness for children changed. Evaluations of ABA's effectiveness had to include both operant procedures and combined behavioral packages. Evaluation of the individual operant procedures and the combined behavioral packages based upon operant procedures have since been determined to be continuously supported by research [4••, 8, 13].

Behavior analysts use these research-supported operant procedures and combined behavioral treatment packages to teach children with ASD a variety of individual functional skills and comprehensive skill repertoires. For children with ASD, these skills address basic learning needs. These learning needs typically involve instruction of communication, social interactions, and adaptive behavior skills.

Functional skills commonly taught for early intervention/elementary school

Communication

Depending upon the functioning level of the child with ASD, behavior analysts use operant procedures to teach a variety of individualized communication repertoires and individual functional skills. Early communication instruction for most children with ASD involves teaching the child to understand verbal communication. Behavior analysts may teach this communication repertoire by combining models with words, repeatedly prompting the child to follow verbal instructions, and reinforcing them following successful approximations to

following verbal instructions [14–16]. As the child learns to understand verbal communication, he also learns how to communicate with others in his environment.

As the child learns to understand others, he also must learn to communicate with others in his environment. For a child without verbal communication skills, communication instruction may begin with vocal imitation or shaping of verbal approximations of words (e.g., verbalizing "ooh" to request "juice"). Some non-vocal children may begin communicating by learning to exchange pictures of objects to communicate their wants and needs [17]. Early Intensive Behavioral Intervention may progress to teaching comprehensive communication skill repertoires from the basic imitation of verbal and nonverbal skills to labeling, identifying, requesting, and conceptualizing of constructs or categories [15, 18, 19].

Children with some verbal communication or more progressed skills learn more advanced communication skills. These may include verbally identifying and requesting common objects in the child's environment, asking and answering questions, initiating or responding to social situations, commenting on play or the environment, or engaging in conversations with adults and peers, e.g., [16, 20–23]. As children learn to communicate, they learn to use these skills within social situations, such as changing conversation topics by asking questions [24].

Social Interactions

As children with ASD learn to communicate, behavior analysts combine the application of specific communication skills and comprehensive skill repertoires with instruction of social and play skill repertoires and individual skills. For young children, behavior analysts use operant procedures to teach comprehensive skill repertoires (e.g., imitation) that assists the child in learning how to play. Play goals may start with basic imitation and prompting strategies to assist the child in learning how to play with toys in conventional or functional ways, such as throwing a ball, stacking blocks, completing puzzles, or looking at books, e.g., [16, 23, 25, 26]. This instruction starts with basic toy play and proceeds to more complex play, such as card and board games (e.g., CandyLand, Bingo, Memory, etc.) and basic pretend play (e.g., pretending to be an animal, pretending to cook a meal, or using figurines and props like construction) [20, 27–29].

As the young child progresses with basic play and communication skills, social interaction goals may evolve to more elaborate and symbolic pretend play. Elaborate pretend play can involve acting out scenarios (e.g., playing house or doctor), using imaginary props (e.g., playing the air guitar) or using one object to stand for another [25, 28, 30]. After the child develops these skills in structured environments, he learns to interact with other children in social pretend play and sociodramatic play (i.e., combining functional toy play and pretend play with peers [30]). This generalization of pretend play skills typically requires advanced combinations of communication skill repertoires and individual skills, such as conversations, imitation, and elaborations on a theme. Children must have some communication skills related to commenting on play and making suggestions related to play to successfully engage in pretend and sociodramatic play [31].

As more elaborate play develops, social interactions begin to evolve to teaching skills for making and maintaining friends and following social rules. These more advanced skills for young children with ASD often include following rules in games, learning when to enter conversations, allowing changes in conversation topics (readers can obtain examples of skills from [16, 23, 32]). Specific skills within these broader social interaction domains may include teaching social initiations (e.g., saying "hello"), responses (e.g., answering a social question), and sharing [22].

Adaptive Behavior

Communication and social interaction skills allow children with ASD to interact with people in their environment. In addition to instruction of these basic interaction skills, children with ASD must be able to complete other basic adaptive behavior to adequately function in a typical, non-structured environment. These skills comprise a variety of domains of functioning. However, common adaptive behavior domains include generalization of communication and socialization skills and daily living skills (see [33, 34] for examples of adaptive behavior domains). Within each of these domains, arbitrary subdomains of adaptive behavior skills further classify the specific types of functional skills needed for success.

Coinciding with the instruction of comprehensive skill repertoires and of individual functional skills for communication and socialization, the instructional focus for teaching adaptive communication and social interactions involves the generalization of skills to the child's everyday living environment. The overlap of communication and socialization for young children with ASD necessitates instruction of adaptive behavior combining both of these areas. Children with ASD must learn skills such as (a) paying attention to people (e.g., making eye contact); (b) understanding what people are saying (e.g., following teachers', parents', and peers' instructions); (c) expressing their needs (e.g., requesting food, asking to play with a friend, requesting help); (d) commenting upon their environment; and (e) holding conversations. While using communication skills, young children with ASD must learn the adaptive social skills of (a) social interactions (e.g., greetings, imitation, making friends), (b) play and leisure skills (e.g., toy play, pretend play, following rules of games), and (c) social manners and rules (e.g., saying "please" and "thank you," eating manners, etc.). The majority of the instruction of these

adaptive skills can be found within the *communication* and *social interaction* sections of this paper.

Instruction of adaptive daily living skills allows young children with ASD to complete activities leading to personal independence. For young children with ASD, these adaptive behavior skills typically include (a) basic personal hygiene (e.g., eating, dressing, brushing teeth, washing hands, toileting); (b) household skills (e.g., setting the table, elementary food preparation, making beds, putting toys away); (c) community integration (e.g., tolerating medical and dental procedures, crossing the street, etc.); and (d) health/safety (e.g., stranger identification, first aid, sleeping routines), e.g., [20, 35]. As with the instruction of individual communication and social interaction skills, adaptive behavior instruction for daily living skills begins with teaching individual components of functional skills. As the child learns each individual skill, the skills combine into larger more complex skill repertoires. For example, a child first may be taught to put his arm into a sleeve of a specific shirt and over time be taught to put on most shirts and coats. The development of the more complex skill repertoire can then be extended to more complex adaptive behavior instructional focus involving dressing, choosing weather appropriate clothing, choosing matching clothing, cleaning clothing, and putting clothing away.

Instructional Procedures for Young Children with ASD

Within each of these basic functional skill domains (i.e., communication, social interactions, and adaptive behavior), a variety of operant procedures and combined treatment packages have been used to instruct functional skills. Table 1 provides examples of the operant principles and procedures used independently and within combined treatment packages to teach skills within each of these domains.

Adolescent/Adult

Beyond the differences of physiological development and learning histories, society creates important but subtle differences between a child and an adolescent. When a child becomes an adolescent, and eventually an adult, members of society generally increase the responsibilities, expectations, and freedom of that individual. An adolescent, for example, may be given greater control to choose activities of interest and make decisions about future plans than would a child. However, from a behavioral standpoint, the basic operant principles of learning do not change as a function of chronological age. Behavior analysts can equally understand the behavior of a young child, adolescent, and adult by examining

Table 1 Examples of early intervention/elementary skills using ABA operant principles and procedures

Skills taught	ABA operant principles and procedures	Example references
Communication	Discrete trial instruction	[2][a], [12, 14, 15, 17, 20–22, 24, 48–50]
Comprehension of labels and commands	Prompts (verbal, visual, physical, gestural, time delay, in vivo model, video model)	
Expressive communication (verbal and picture)		
Vocal imitation	Prompt methods (most-least, least-most, fading)	
Requesting	Reinforcement (tangible, edible, verbal, tokens)	
Comments and questions	Shaping	
Conversations	Chaining	
	Discrimination training	
	Generalization programming	
	Incidental teaching	
Social interactions	Discrete trial instruction	[12, 20, 22], [25–32][a], [35, 48, 50, 51][a]
Motor imitation	Prompts (verbal, physical, gestural, in vivo model, video model)	
Functional toy play		
Symbolic, dramatic, pretend play	Prompt methods (most-least; least-most)	
Board games and rules	Reinforcement (tangible, edible, verbal, tokens)	
Athletic games and rules	Shaping	
Social initiation	Chaining	
Sharing	Discrimination training	
Social commenting	Generalization programming	
Adaptive behavior	Discrete trial instruction	[20, 35, 48–50, 52, 53]
Daily living skills	Prompts (pictorial, gestural, verbal, in vivo model, video model, time delay)	
Household skills		
Personal hygiene	Prompt methods (most-least, fading)	
	Reinforcement (tangible, edible, verbal)	
	Shaping	
	Chaining	
	Discrimination training	
	Generalization programming	

[a] Literature reviewing the efficacy of ABA operant procedures

operant principles. From this perspective, behavior analysts can consider interventions or comprehensive programs based on basic operant principles to be conceptually efficacious at any age.

Following this argument for the conceptual support of operant principles for adolescents and adults, research also supports the use of specific operant procedures for this population, e.g., [36–38]. This generalization of conceptual support may be needed as the literature base examining research-support for operant principles and procedures directly for adolescents and adults with ASD remains less than that for children [8, 39, 40]. However, in a meta-analysis of behavioral interventions for adolescence and adults with ASD, Roth et al. [38] found evidence to support the use of operant procedures across a range of functional skill domains (e.g., adaptive skills and academic skills). Although this conceptual support for operant principles and procedures exists, this support does not typically specify the details of application or the unique challenges when developing a program for an adolescent or adult.

Although challenges exist with direct application of some operant procedures to adolescents and adults, adolescents and adults with ASD require instruction in similar functional skill domains (i.e., communication, social interactions, and adaptive behavior) as children with ASD require. However, as a child moves into adolescence, different *specific* functional skills may be required from the comprehensive skill repertoires and individual functional skills taught in childhood. Adolescents and adults may continue to require instruction of basic communication and social skills; however, targeted skills may take on additional adaptive behavior directions like exercise and health, vocational skills, or more elaborate community daily living skills.

Functional Skills Commonly Taught for Adolescent/Adults with ASD

Adaptive Behavior

The transition from childhood to adolescence and adulthood for individuals with ASD often marks a shift in instructional focus to the adaptive behavior and skills necessary for success beyond school. Although instruction for younger children often emphasizes comprehensive skill repertoires (e.g., imitation) and instruction of individual functional skills, instructional programs for adolescents and adults concentrate more on specific functional skills. This transition creates a more specialized instructional focus on adaptive skill repertoires. These adaptive behavior repertoires of adolescents and adults with ASD commonly include vocational, domestic, personal, community, and leisure skills [33, 34].

Vocational

As an adolescent and adult mature from school-age to employment-age, he or she requires instruction of the functional skills required at the job or workplace. Behavior analysts label these job-tasks and appropriate workplace social behavior as vocational skills. When developing a vocational skill program, behavior analysts assess the job-task preference of the individual [41]. As the skills necessary to perform the preferred job-tasks vary, the unique needs of the preferred vocation and workplace guide the instruction of specific functional vocational skills. Vocational skills specific to performance of a job-task may include (a) acquisition of specific work-task skills (e.g., preparing envelopes for mailing) [42], (b) seeking assistance with work-related problems [43], (c) increasing job-task independence [44], and (d) completing job-task performance skills [45]. In addition to vocation-specific skills, job success frequently requires proficiency of many of the foundational skills discussed throughout this review (e.g., communication and social interactions). If required, behavior analysts typically instruct these foundational skills for adolescents and adults as individual functional skills.

Personal and Domestic

In addition to completing work-related skills, adolescents and adults with ASD must learn to complete skills allowing them to successfully live as independently as possible. The personal and domestic skills required for independent living include functional skills, such as completing household chores, participating in their own personal care, maintaining bodily health, and completing essential daily tasks [33]. The broad adaptive behavior repertoire of personal and domestic skills can be sub-divided into even more specific personal and domestic skills. Personal skills may include dressing, toileting, grooming, bathing, health awareness, nighttime routines, and exercise [33]. Domestic skills may include, meal preparation, home awareness (e.g., kitchen safety skills), and home upkeep (e.g., paying bills). Instruction often follows a hierarchical skill progression from basic personal care skills (e.g., self-dressing and self-feeding) to more advanced independent living skills (e.g., shopping and meal preparation).

Instruction within this broad adaptive skill domain often starts in early childhood (e.g., toilet training) and continues through adolescence and adulthood (e.g., personal hygiene). As the child matures to adolescence and adulthood, the additional self-care and domestic responsibilities evolve to more complex and complete personal and domestic functional skills. However, sometimes, child maturation to adolescence does not result in mastery of the basic adaptive personal care skills. Thus, instruction of basic functional skills in these domains must continue during adolescence and adulthood, e.g., [46].

Community

In addition to completing vocational and personal functional skills for more independent living, adolescents and adults with ASD must learn to interact within a larger, social community. Following the deinstitutionalization movement of the 1960s and 1970s, individuals with developmental disabilities—including autism—became more active members of the community. Adolescents and adults with ASD had to learn community skills that allowed them to meaningfully and actively participate in society [33].

To meaningfully and actively participate in society, adolescents and adults with ASD have to learn basic community interaction functional skills. These functional skills typically include skill areas, such as (a) community mobility (e.g., crossing the street), (b) community safety knowledge (e.g., seeking help from appropriate community members, phone use), (c) community commerce (e.g., shopping skills, purchasing items), (d) community manners (e.g., eating), and (g) community schedules (e.g., telling time for bus schedules) [33]. Behavior analysts choose specific community skills for instruction from the individual's current and projected skill needs within these community domains. For example, a primarily independent person's instructional focus may include budgeting, debit card use, and paying bills. An adolescent or adult requiring more assistance may require instruction in determining community signs (e.g., men's or women's bathroom) and ordering a meal.

Leisure Skills

The lives of adults and adolescents with ASD do not involve all work and no play. They must develop leisure skills (i.e., functional skills allowing for engagement in enjoyable activities) for these more relaxing portions of their days. This idiosyncratic class of behaviors varies as activity preferences vary significantly across individuals and across the lifespan. For young children with ASD, leisure skill instruction involves social interactions and play. For adolescents and adults, leisure skills may include engaging in multiple activities, such as relaxation (e.g., knitting), social

Table 2 Examples of adolescent/adult skills using ABA operant principles and procedures

Skills taught	ABA operant principles and procedures	Example references
Vocational	Antecedent Intervention (motivating operations, instructional S^D)	[42, 43, 54, 55]
Job-task skill acquisition	Prompts (visual, script, graduated guidance, time delay)	
Seeking assistance or help	Prompt methods (fading, proximity, stimulus, most-least)	
Job-task independence	Reinforcement (tokens, tangible, break, edible, verbal)	
Job-task performance	Generalization programming	
Personal and domestic	Antecedent intervention (training, goal setting, modeling)	[56–58]
Setting the table	Prompts (video vibrating pager, verbal, physical)	
Putting away groceries	Task analysis	
Reducing rapid eating	Reinforcement (verbal)	
Exercise	Generalization programming	
Basic hygiene		
Cleaning		
Cooking		
Community	Antecedent intervention (training, modeling)	[44, 59–62]
Social interaction	Prompts (time delay, graduated guidance)	
Basic money skills	Prompt methods (fading, least to most)	
Increased independence	Chaining (task analysis, total task)	
Answering a cell phone	Reinforcement (verbal, token)	
Seeking assistance when lost	Generalization programming	
Leisure	Antecedent intervention (instructions)	[63–66]
Teaching photography skills	Prompts (video, time delay, most-to-least)	
Tabletop games	Chaining (task analysis, backwards)	
Outdoor activities	Reinforcement (verbal, tangible, edible, preference assessments)	
Physical activities		
Internet skills	Generalization programming	

interactions (e.g., playing a board game with friends), physical activity (e.g., hiking), and entertainment (e.g., watching a movie). The specific leisure skill targets should be selected with the input of the individual adolescent's or adult's activity preferences.

Instructional Procedures for Adolescents and Adults with ASD

Instruction of adaptive behavior for adolescents and adults with ASD relies more upon operant procedures than on the combined treatment packages found in early childhood/ elementary school aged instruction. As with instruction of young children with ASD, behavior analysts use a variety of operant procedures to teach basic adaptive behavior repertoires (i.e., vocational, domestic, personal, community, and leisure skills). Table 2 provides examples of the operant principles procedures used independently and within combined treatment packages to teach skills within each of these domains.

Conclusion

For young children, adolescents, and adults with ASD, operant principles and procedures provide research-supported treatment options for teaching individual functional skills and comprehensive skill repertoires. As children mature into adolescents and adults, the instruction of specific functional skills may evolve, but the operant procedures used to teach the skills typically do not. The application of ABA for these individuals with ASD can be supported along two levels. First, an instructional program explicitly designed from basic operant principles (e.g., reinforcement) could be considered conceptually efficacious. Second, a program derived from specific evidence-based operant procedures (e.g., most-least prompting, task analysis, and token economies) and comprehensive treatment packages (e.g., early intensive behavioral intervention) can be considered research-supported.

Readers are cautioned that the examples of skill instruction with accompanying operant principles and procedures discussed in this manuscript must be interpreted and applied carefully. We do not suggest that using only one operant principle or procedure (e.g., prompting alone) will result in acquisition of the example skills mentioned in this paper. Typically, combinations of operant principles and procedures must be used for meaningful learning to occur. Although many of the programs frequently used by behavior analysts maintain both conceptual and empirical support for individuals with ASD across the lifespan, trained behavior analysts must apply these principles and procedures with fidelity to the standards of the discipline.

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