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A summarization of the study from BAT:

Behavioral Intervention for Autism: A Distinction Between Two Behavior Analytic Approaches

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Purpose of the Article:

Applied Behavior Analysis (ABA) has come to be accepted as the treatment of choice for children with autism by professionals and parents alike (Schreibman, 1997). With this acceptance comes an increasing demanding for programs that employ the ABA methodology to be implemented for pre-school and school-aged children diagnosed with ASD in school settings. Therefore, it is vital for school personnel to understand the distinction between different types of programs that fall under the umbrella of ABA and what is implied when parents request discrete trial or applied verbal behavior programs.

Gresham, Beebe-Frankenberger and MacMillan (1999) evaluated a number of programs behavioral and educational treatment programs for children with autism. These included, the UCLA Young Autism Project (YAP), based on the work by O. Ivar Lovaas (1987); Treatment and Education of Autistic and Related Communication Handicapped Children (Project TEACCH), based on the work of Schopler and Reichler (1971); and Learning Experiences Alternative Program (LEAP), based on the work of Strain and others (1977). Since this evaluation, other program that are behavioral analytical in nature have been employed. These include Pivotal Response Training (PRT) (Koegel, Koegel, & Carter, 1999) and Applied Verbal Behavior (AVB) (Sundberg & Michael, 2001).

Due to the number of intervention programs under the umbrella of ABA, the purpose of this paper is to distinguish between two popular approaches currently provided for early intervention and school-aged children in home- and school-based settings: Lovaas' Young Autism Project (YAP), more commonly referred to as Discrete Trial Instruction (DTI) or Discrete Trial Teaching (DTT), and B.F. Skinner's Analysis of Verbal Behavior, more commonly referred to as Applied Verbal Behavior (AVB or simply VB). This paper refers to DTT as DTI.

Background and results from Lovaas:

All participants in the original Lovaas study (1987) had a diagnosis of autism and a chronological age of less than 40 months if non-verbal, and less than 46 months if presented with echolalia. The experimental group (n=19) received intensive one-to-one treatment for more than 40 hours per week for two years, whereas Control Group 1 (n=19) received minimal one-to-one treatment, characterized by 10 hours or less, also for two years. Participants were assigned to one of these two groups based on the number of available staff and the distance participants lived from UCLA. An additional control group (Control Group 2) was comprised of 21 participants selected from those participating in a previous study by Freeman, Ritvo, Needleman, & Yokota (1985). Data from this control group helped to control for biased participant selection. Participants were treated like Control Group 1 subjects but were not treated by the DTI team. The goal of this project was to maximize treatment gains by providing the intervention for



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most of the participants' waking hours. Results showed 47% of the participants in the experimental treatment group achieved normal intellectual functioning as defined by normal-range IQ scores and successful performance in first grade in a public school setting (Lovaas, 1987).

DTI, as implemented in the original Lovaas study (1987), is a specialized form of instruction that breaks down tasks/instructions into smaller teachable units. This consists of a cue (SD), prompt, student response, and a consequence (i.e., reinforcement or feedback in the form of error correction). Gresham et al. (1999) define the core characteristics of DTI as a Discriminative Stimulus (SD)-response-consequence type of instructional delivery that includes discrimination training and compliance with instructional commands (e.g., "Stand up" and "Touch your nose").

Background to the AVB Approach:

The AVB approach to teaching children with autism incorporates discrete trial instruction; however, for language acquisition it relies on B.F. Skinner's classification of language with initial emphasis on teaching expressive language with manding (Carbone, 2003; Carbone, 2004; Sundberg & Partington, 1998). Although this approach has not been promoted by professionals as an educational treatment package or method, consumers of this approach have taken it as such.

This approach emphasizes the formal and functional properties of language and distinguishes between several different types of functional control (Sundberg, 2003). Skinner defined the mand as a type of verbal relation whose response form is controlled by a motivational variable, termed establishing operation (EO) (i.e. satiation, deprivation, and aversive stimulation), or more recently termed, motivational operation (MO) (Laraway, Snyckerski, Michael, & Poling, 2003). The mand is a type of verbal behavior where the speaker asks for what he or she wants, resulting in specific reinforcement (i.e., access to a desired item specific to the request) (Sundberg, 2003). Other verbal relations proposed by Skinner are tacts (labelling items in the environments), echoic (repeating what is said), intraverbal (responding to a verbal stimulus), textual (reading) transcriptive (writing).

Advocates of the AVB approach credit Lovaas and colleagues for their contribution and advancement to the field of ABA in autism treatment but criticize their work for failing to implement the concepts and principles provided by Skinner in his book *Verbal Behavior* (1957). Particularly, Lovaas and colleagues' failure to make use of early mand training and transfer control procedures to teach across all the verbal operants.

Differences in the Curriculum DTI and AVB approaches:

The curriculum scope and sequence for DTI programs is derived from resources such as *Teaching Developmentally Disabled Children*, *The Me Book* (Lovaas et al., 1981), *Behavioral Intervention for Young Children with Autism* (Maurice, Green, & Luce, 1996), *A Work in Progress* (Leaf & McEachin, 1999), and more recently, *Teaching Individuals with Developmental Delays, Basic Intervention Techniques* (Lovaas, 2003). Considering, that there is no standard assessment practice and numerous curriculum resources, each child's program varies with regard to the order in which new tasks are presented. Skills generally begin being taught in the simplest format and increasing in complexity.



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Generalising each skill involves the children practising the skill across instructors, materials, and settings, as well as programming for common stimuli and using multiple exemplars.

AVB programs rely on the Assessment of Basic Language and Learning Skills (ABLLS) (Partington & Sundberg, 1998) as a standard assessment tool and baseline. The completed ABLLS provides a visual display of the learner's strengths and weaknesses across 26 skill domains. No other guides to curriculum or teaching targeting this approach are commercially available.

Differences in Reinforcement and Motivation in DTI and AVB approaches:

DTI programs typically employ a negative reinforcement paradigm for learner motivation (i.e., the student can work for earned breaks from task) (Harris & Weiss, 1998). Additionally, other components of an individualized motivational system such as token systems of reinforcement and choice boards comprised of photos of potential rewards are incorporated.

The AVB approach places emphasis on the teacher initially becoming a conditioner reinforcer for the child. This is gained through pairing the teacher with reinforcement and demand fading procedure. The AVB approach focuses on the issue of positive reinforcement and motivation to increase on-task behaviors. Dense schedules of reinforcement for initial mand training are continuous; fading to thinner and/or variable schedules are implemented as quickly as possible during intensive teaching time (ITT) and faded as the learner is successful (Carbone, 2004). In an AVB program, there tends to be less reliance on token boards, choice boards, and other visual displays that are common to motivational programs in a DTI approach.

Differences in the Delivery of instruction in DTI and AVB approaches:

In DTI programs, instruction is typically delivered via a 1:1 or 1:2 teacher-to-student ratios (Harris & Weiss, 1998). The teacher and student are usually situated at a desk or table facing one another. Instruction is introduced in an environment where distractions are minimized. Novel concepts are often introduced in isolation or mass trials.

AVB programs also employ the 1:1 or 1:2 teacher-to student ratio, however, the initial phases of teaching take place in the natural environment and not at the table. AVB programs emphasises Natural Environment Teaching (NET) also referred to as incidental teaching. This form of teaching relies on the student's motivation for instruction and there is no specified teaching place. The delivery of instruction during ITT is the same as that of discrete trial instruction. Both approaches would suggest a ratio of easy-to-hard tasks that is approximately 8:2 or 7:3. In addition, the AVB approach emphasizes teaching skills to fluency and a quick pace of instruction with shorter latencies for the learner to respond (0-2 seconds as opposed to a traditional DTI approach of 5-7 seconds).



Differences in prompting and Error Correction Procedure in DTI and AVB approaches:

In DTI programs, initial reliance is on errorless teaching procedures such as a most-to-least prompting sequence, constant and progressive time delay, stimulus fading, positional cues, and blocked errors (Agnew & Kates-McElrath, 2004). As the learner acquires skills, the no-no-prompt error correction procedure is introduced. This procedure presumes the student can respond correctly to the instruction or self-correct following a "No" or no alternative ("Try again") from the teacher. This approach allows for two errors before prompting is provided (Pelios & Kates-McElrath, 2002). Although both rely on errorless teaching methods as described above, the AVB approach does not employ the no-no-prompt model of error correction. In addition, it places added emphasis on transfer trials following errors of responding (Carbone, 2003).

Differences in Language acquisition in DTI and AVB approaches:

Traditional DTI programs place an earlier emphasis on receptive identification and/or expressive labelling (tacting) of objects or photos rather, than teaching students to request desired items (manding) as in AVB programs. In DTI listener skills are targeted before speaker skills. As stated earlier the initial stages of the AVB program involves stimulus-stimulus pairing, during this stage the child's naturally occurring vocalization(s) (i.e., babbling sounds) is established as a conditioned reinforcer through the temporal pairing of a therapist's vocal model with a desired item.

Differences in Data Collection Procedures in DTI and AVB approaches:

Traditional DTI programs rely on teachers and therapists to collect trial-by-trial data that reflect student performances during teaching (Harris & Weiss, 1998), often yielding a percent correct in 10 or 20 trials. Task analytic data are collected on skills targeting leisure, self-care, and vocational domains.

AVB programs are characterized by first trial yes / no probe data. Probe data are often ideally collected in the morning (school-based probe) and evening (home-based probe) for evidence of generalisation across settings and materials. Probe data allows the teacher to be available to focus on teaching as opposed to recording each student response. It also facilitates a quicker pace of instruction (Carbone, 2003).

Both approaches rely on visual displays of data as well as data-based decisions regarding student progress and program changes (Harris & Weiss, 1998). The AVB approach however, favors cumulative graphing over traditional percentages or number correct (Carbone, 2003).

Recommendations for future research:

Future research should involve outcome measures for both approaches. Comparative research between both approaches is also needed to assess which if any of the approaches is better than the other at increasing language acquisition in children with autism.



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For a more comprehensive read and further information please download the paper from Behavior Analyst Today: <http://www.behavior-analyst-online.org/newBAT/VOL-7/BAT-7-2.pdf>

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