

## A Brief Report on the Verbal Behavior Curriculum (VBC) to Teach Children With Autism and Other Language Disorders

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This article gives an account of the development of a scope-and-sequence based curriculum, the Verbal Behavior Curriculum, and an overview of the learning principles that directed its design and incorporation of instructional delivery and management procedures. The curriculum was informed by both Skinnerian and post-Skinnerian accounts of complex language and cognitive behaviors, instructional design and delivery technologies derived from discrete trial-based, Direct Instruction and Precision Teaching research as well as application concepts. The bulk of the article details that part of the curriculum's design intended to instantiate 3 critical behavioral repertoires (aka cusps): (a) early stages of participative, listener and observant skills, essential components for social behavior, (b) readiness/attention skills that enable the acquisition of missing prerequisite skills to acquire high order generative language, and (c) use of language skills in social situations to develop the full potential of the learner, sometimes turning into a fully verbal individual.

*Keywords:* verbal behavior, functional communication, language curriculum, language development, complex language

The Verbal Behavior Curriculum (VBC) is designed to systematically teach the competencies and capacities - typically expressed by generative, fully verbal speakers, listeners, and problem solvers - to children who are at risk for delayed academic, social, and language development. As such, the curriculum is not limited in its application to any one diagnostic group and it may be applied to address the language development needs of any child (Williams & Greer, 1993). The design and implementation of the curriculum is grounded in applied and experimental verbal behavior and learning research of both internal and external origin to the author (Gladys Williams) of the curriculum and

is the product of 30 years of applied practice and research with children presenting with autism and related disorders.

The design and delivery of the VBC's teaching protocols come from (a) the behavioral learning principles outlined in the empirical research of applied and experimental behavior (e.g., Catania, 2013; Cooper, Heron, & Heward, 2007; Mayer, Sulzer-Azaroff, & Wallace, 2013), (b) the VBC research and discussion literature including Skinner's 1957 book *Verbal Behavior*, in which he gave a functional account of language development, and (c) relevant "post-Skinnerian" operant treatments of complex language and cognitive functioning (cf. Barnes-Holmes, Barnes-Holmes, & Cullinan, 2000; Hayes, Barnes-Holmes, & Roche, 2001).

Prior to Skinner's 1957 treatise, the interpretation and analysis of language development came primarily from a "mentalist" approach, which was comprehensively summarized by Skinner during his William James Lectures (Skinner, 1948). In contrast to a still prevalent mentalist analysis, Skinner noted that interactions between people and the environment, in

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which different instances of similar forms of a response (e.g., “water”), were controlled by different constellations of environmental antecedent and consequential events that functioned to control the observed dependent verbal responses. In making this distinction, Skinner’s analysis set a foundation for the emergence of a technology of instruction based on an understanding of the functional interaction of antecedent and consequential events that could be subsequently controlled to teach specific verbal capacities and competencies (Greer & Ross, 2008; Rehfeldt & Barnes-Holmes, 2009). Variations of these specifications have shaped the teaching and instructional protocols contained within the VBC.

### Phylogeny of the VBC

The VBC is a contemporary extension of Skinner’s (1957) and Williams and Greer’s (1993) functional analytic approach to understanding the nature and complexity of language. This extension includes reference to and the inclusion of instructional technologies arising from Direct Instruction (Binder & Watkins, 1990), Precision Teaching, (Kubina & Yurich, 2012), and Relational Frame Theory (RFT; Hayes et al., 2001; Murphy, Barnes-Holmes, and Barnes-Holmes, 2005; Rehfeldt & Barnes-Holmes, 2009) research and practice. Another significant reference source for the VBC is the journal *The Analysis of Verbal Behavior*, first published in 1982, and now a primary source for publishing summary, position and research papers on the study of verbal behavior as a primary subject matter.

The Williams and Greer (1993) study is noteworthy because it was the first attempt to directly compare Skinnerian and traditional linguistic language curricula. This study compared several outcome measures of learners receiving purely verbal behavior-based instruction against the same outcome measures for learners receiving instruction based on a traditional linguistic approach, similar to that found in many Lovaas (1987) programs. The verbal behavior-based programming was more effective and efficient in establishing and generalizing a broad range of assessed capacities. The study compared the number of words emitted correctly during training trials and the number of correct responses to maintenance probes conducted across verbal

behavior and linguistic curricula. Each curriculum used a reversal design (ABAB), alternating linguistic-based phases with verbal-behavior phases, applied to three adolescents with developmental disabilities. Operant training procedures specified as incidental and discrete-trial procedures, were held constant across conditions. The results showed that more words were emitted in the verbal behavior training phases for all subjects, and the responses learned under the VBC were maintained and generalized more than the words learned in the linguistic based curriculum despite little difference in the number of correct responses. The authors interpreted the findings as an indication that (a) the two curricula are indeed different, and (b) the approaches implicit in Skinner’s *Verbal Behavior* are likely to produce greater maintenance and generalization of the communicative responses taught in this study. As such, these results can be considered more direct evidence of support for the verbal behavior approach.

Prior to Williams and Greer (1993) there were few applied (Simic & Bucher, 1980; Sundberg, 1985), experimental (e.g., Chase, Johnson, & Sulzer-Azaroff, 1985; Lamarre & Holland, 1985; Lodhi & Greer, 1989; Michael, 1984; Savage-Rumbaugh, 1984), and discussion manuscripts (Greer, 1986, 1990; Stratford, Sundberg, & Braam, 1978; Sundberg, 1980) reporting on the potential of a Skinnerian-based verbal behavior approach to language intervention programming. Fifteen years following the Williams and Greer (1993) demonstration, Greer and Ross (2008) published “Verbal Behavior Analysis: Inducing and Expanding New Verbal Capabilities in Children with Language Delays,” an in-depth analysis with empirical demonstrations of the efficacy of verbal behavior programming for establishing and inducing complex language behavior capacities in individuals either lacking or wan of such capacities.

Publications on verbal behavior research have significantly accelerated and continue to accelerate today (cf. extended analysis of empirical citations with Skinner’s *Verbal Behavior*: Dixon, Small, & Rosales, 2007; publication trends in *The Analysis of Verbal Behavior*: Marcon-Dawson, Vicars, & Miguel, 2009; Luke & Carr, 2015). In addition, as the Murphy and Barnes-Holmes (2010); Murphy, Barnes-Holmes, and Barnes-Holmes (2005), and Rehfeldt and Barnes-Holmes (2009) publications on

verbal behavior/RFT programming illustrate, there is a significant increasing trend of publications focused on improving our understanding and utilization of a technology of complex human behavior.

It should be noted that there has been an ongoing discussion within the field regarding the adequacy and completeness of RFT concepts and processes as a sufficient explanation of complex human verbal and cognitive behavior (Hayes & Barnes-Holmes, 2004; Healy, Barnes-Holmes, & Smeets, 2000; Horne & Lowe, 1997; Michael, Palmer, & Sundberg, 2011; Palmer, 2004). Following a review of this literature, in addition to empirically based sources that suggest replicable pragmatic effects (aka “teaching procedures”) derivable from RFT research and organization concepts (Berens & Hayes, 2007; Rehfeldt & Barnes-Holmes, 2009; Sprinkle & Miguel, 2012), lead to a decision to incorporate RFT technology within the curricular and instructional design decisions made in formulating the VBC.

The cumulative knowledge of the field of Verbal Behavior analysis research and practice is the backbone of the VBC. The VBC is an organization and systematization of that literature and cumulative knowledge base within a scope-and-sequence curriculum matrix. This organization will be described below.

### Scope and Sequence

The VBC’s scope-and-sequence organization of lessons (see Table 1) was constructed to teach both prerequisite and corequisite component/composite repertoires across several important learning readiness and verbal behavior repertoires (Participating, Observational learning, Listener, Echoic, Manding, Tacting, Intraverbal and Textual; see definitions in the *Glossary* section). Skill tracks within each of these domain areas are organized and sequenced within a component/composite analysis of simple discriminative and complex conditional stimulus control of simple and complex response forms (e.g., sounds to words, words to sentences, words and sentences in conversation, etc.). For example, within the learning readiness track a learner is shaped to first look at the eyes of an attending adult, then to shift his or her gaze to back and forth from a desired item to the eyes of the attending adult. When such relatively simple “joint attention” skills have been established, other types of programming may be

put in place. For example, sustained visual regard of the attending adult may be shaped and then used as a context for respondent conditioning of the attendees smile as a potential reinforcer.

As mentioned earlier, the VBC is intended to produce generative language capacities (Johnson & Layng, 1994), with composite repertoires employed as dependent measures of the generative effect of directly taught component skills. The utilization of component/composite relations is managed throughout the curriculum to promote the eventual development of language capacities that allow learners to participate in advanced language/cognitive curricula that utilize instructional technologies such as Direct Instruction, Precision Teaching and RFT programming. The VBC accomplishes this goal by systematically teaching component/composite relations that create assumed behavioral cusps and other generative language/cognitive abilities (i.e., speaking with meaning and listening with understanding: Stewart, McElwee, & Ming, 2013).

The target to produce generative language capacities is achieved by (a) applying respondent and operant technologies and operations to the shaping and conditioning of joint attending (e.g., visual regard and gaze shift), emergent social (e.g., conditioning the smile of another person to have value), and instructional participation (e.g., conditioning adult proximity to have value) repertoires; (b) embedding equivalence and other (e.g., hierarchical) relational programming through the sequential management of instructional targets (e.g., animal name/sound coordination training accompanied by the assessment or derived and, if necessary, training of animal sound/name coordination; or “stating features given name” programming accompanied by the assessment and, if necessary, “stating name given features” programming); (c) systematically fading adult attention, proximity, oversight, and schedules of reinforcement by managing the fading of those variables in moving from 1:1 to 1:2 and to small group instruction (while maintaining high levels of participation in instructional activities); and (d) the important behavioral cusps (e.g., the ability to derive symmetric and other types of entailed and mutually entailed relations, controlled by contextual variables and transformations of function).

Finally, the generative output of the VBC itself is evaluated against curriculum-based measures (e.g., the VB-MAPP—Verbal Behavior Mile-

Table 1  
VBC Scope and Sequence Summary

Sections	Learner lead/adult lead (conditioning)										Adult lead/table based 1:1										Group learning 1:2									
	1.01	1.02	1.03	1.04	1.05	1.06	1.09	1.10	1.09	1.10	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.21	1.09	1.10	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.21
1. Participating	Cond Prox	Cond Part	Cond Part	Sit Still	Ready	Ready	Wait	Cond Group	Cond Ind	Visual Track	Visual Regard	Visual Regard	Visual Track	Visual Track	Visual Track	Visual Track	Visual Track	Visual Track	Visual Track	Visual Track	Visual Track									
2. Observational learning	2.01	2.01	2.02	2.02	2.03	2.03	2.04	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	
3. Listener	3.01	3.02	3.02	3.03	3.04	3.05	3.06	3.07	3.08	3.09	3.10	3.11	3.12	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	
4. Echoic	4.01	4.01	4.01	4.02	4.02	4.02	4.02	4.03	4.04	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05	
5. Manding	5.01	5.02	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	
6. Tacting	6.01	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	
7. Intra-verbal	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	
8. Textual	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	8.01	

Note. Cond Prox = Conditioning Proximity; Cond Part = Conditioning Participation; Part = Participation; Cond Group = Conditioning Participation in Group Activities; Cond Ind = Conditioning Independent Engagement in Activities; Cond Faces = Conditioning Faces as Reinforcers; GMI = Gross Motor Imitation; FMI = Fine Motor Imitation; IMTS O-O = Identical Matching to Sample - Object to Object; IMTS P-O = Identical Matching to Sample - Picture to Object; IMTS P-P = Identical Matching to Sample - Picture to Picture; Cond Faces = Conditioning Faces as Reinforcers; Cond Voice = Conditioning Voices to have value; Cond Direct = Conditioning "Adhering to Directions" to Have Value; Cond Smile = Conditioning Smiling as a Reinforcer; Func Com = Functional Commands; Rein Vocal = Reinforcing Vocalizations; Cond Echoic = Conditioning Echoics; M-E = Mand to Echoics; Echo Ext = Echoic Extension; Shape Etiqu = Etiquette; Sequenc = Sequencing; Mand 1 = Requesting; Mand 1 = Requesting Level 1 programming; Mand 2 = Requesting Level 2 programming; Mand 3 = Requesting Level 3 programming; Mand 4 = Requesting Level 4 programming; MTS = Matching to Sample. The codes embedded within the matrix refer to the protocols in each of the eight listed repertoires. This table is an illustration of the overall organization of the curriculum and does not contain all the lessons within a track.

stones Assessment and Placement Program, ABLLS-R—The Assessment of Basic Language and Learning Skills—Revised, and BEBS—the Behavioral Evaluation of Basic Skills) as independent variables used to assess its internal and external efficacy, efficiency and validity. Data from these measures influence decisions on both curricular and instructional design and delivery.

### Progression of Instructional Delivery

Instructional delivery progresses systematically from simple to complex constellations of contingencies and responses. This progression moves from simple respondent conditioning and operant shaping contingencies, to discrete trial and fluency development contingencies, and into Direct Instruction scripted instruction contingencies. Written protocols fully describe and detail the tactics and procedures that support a progressive and cumulative movement through the curriculum. Instructional delivery systematically evolves from initial 1:1, play-based, and teacher-directed programming to normalized large-group and classroom-based instructional format.

The initial protocols have been designed to both condition and teach participatory, listener and observational skills, essential components to acquire social behavior through a balance of captured and contrived teaching moments. Protocols are designed to establish and strengthen behaviors that lead to attachment and participatory behaviors and include descriptions of how to shape adult proximity and interaction, shape facial expressions and voices to have a reinforcing value through a combination of operant and respondent pairing contingencies (Greer, Singer-Dudek, & Gautreaux, 2006; Nuzzolo-Gomez, Leonard, Ortiz, Rivera-Valdes, & Greer, 2002; Shillingsburg, Hollander, Yosick, Bowen, & Muskat, 2015). Other protocols teach the essential tact repertoires for naming, categorizing, and describing the features and functions of objects that are subsequently used to teach rudimentary social/conversational skills (Greer, Stolfi, Chavez-Brown, & Rivera-Valdez, 2005; Greer, Stolfi, & Pistoljevic, 2007; Miguel, Petursdottir, Carr, & Michael, 2008; Pérez-González, Díaz, Fernández-García, & Baizán, 2015; Pérez-González, Garcia-Asenjo, Williams, and Carnerero, 2007; Pérez-González, Hervzlikowicz, and Williams, 2008; Williams, Carnerero, & Pérez-González, 2006; Williams, Pérez-González, and Vogt, 2003).

Following implementation of initial “play-based” formats, instructional programming moves to explicit teacher-directed programming in which the adult sets every opportunity for responding and the learner responds within predetermined response criteria. Adult-directed teaching is used to directly establish behavioral cusps such as generalized imitation, development of a listener repertoire, naming as an integrated listener/speaker capacity, among other skills. As adult-directed programming is introduced, what may be called “semidirected” programming is also introduced. Semidirected programming establishes behavior under the control of stimuli controlled by academic, art, or leisure materials and provides a platform for the development and evolution of self-management and self-guidance capacities. Thus, the VBC progressively moves toward developing skills that are controlled by group settings, in the pursue of preparing the learner to respond accordingly in classroom and/or similar social contingencies.

### Other Aspects of the Curriculum and Future Refinements

The curriculum has been aligned to commonly used behavioral assessment tools such as the VB-MAPP (Sundberg, 2008), the ABLLS-R (Partington, 2006), the Common Core Curriculum standards, and the BEBS (Williams, Garbarini, & Rodriguez-Mori, 2012). These alignments are indicated within the curriculum by codes and allow for both the individualization and external evaluation of progress of each learner’s program. To ensure that each learner receives an individualized program, the VBC uses these tools as a form of curriculum-based assessment to pinpoint where a learner should start his or her language/cognitive habilitation.

The VBC is a work in progress, as it should be, and will be refined in accordance with current and future research findings and guidance (e.g., Petursdottir & Carr, 2011). It is, as is any curriculum, an attempt to engineer a complex contingency field that has temporal extant and needs to account for the interaction of both proximal and distal antecedent-behavior-consequential relations of ever growing complexity. As is true of evolution in general (Gould, 1996), the VBC starts from a “left hand wall” of simplicity and moves toward ever greater complex behavioral forms and variations.

The complexity and generativity of verbal behavior that is eventually demonstrated by an individual learner moving through the VBC will always be determined by a complex confluence of ontogenetic, curricular and instructional design and delivery, and human resource allocation variables. To the extent possible the VBC will continue to be enhanced and updated in account of conceptual and technical breakthroughs and findings in the field. These trends will be ever changing and are beginning to show signs of specialization that will, eventually, make it important to integrate parallel technologies and operations (cf. Catania, 2013). Still, the level of scholarly awareness and ability to accomplish that task will grow ever more challenging as the relevant fields of thought, study, and application (e.g., Respondent Conditioning, Simple and Complex Stimulus Control, Temporal Discounting, Direct Instruction, Precision Teaching, RFT, Generative Instruction, etc.) evolve and branch on separate tracks. Any program that attests to produce “fully verbal” individuals must account for the contribution of each of these determiners of operant behavior and order, align and manage them to engineer such an outcome.

### Glossary

1. **Participating:** The lessons in this section are designed to establish learning capacities that extend from initial play base to small group instruction formats.
2. **Observational learning:** This phase is to induce the capacity to learn through the visual and/or auditory observation of others and the environment.
3. **Listener:** This phase is to teach the learner the capacity to respond to verbal antecedents as a listener.
4. **Echoic:** This phase is to induce precise vocalizations of standard phonemes, sounds, words, and phrases.
5. **Manding:** This phase is to induce the capacity to spontaneously request desired items, actions, activities, and information with precision. The learner learns to express his or her dislikes and to convey in a clear manner what is desired. Developing the capability to express your wishes and desires in an assertive manner is also the goal of this section.

6. **Tacting:** The lessons in this section are designed to evoke spontaneous responses (including signing and pointing while joint attending) and comments about the natural environment. Learning to respond verbally without verbal antecedents to natural events that occur in the environment is the goal of most interventions. These protocols are designed to develop the spontaneous ability of making comments about the environment, building it gradually from pointing, to sounds, to words, to statements. The objective is to teach the learner to respond independently and be natural.
7. **Intraverbal:** The lessons in this section are designed to systematically teach advanced cognitive and Intraverbal behavior. The cognitive programming is designed to promote, derive relational responding such as derive symmetry, transitivity and other relational frames. The Intraverbal programming is intended to teach verbal behavior capabilities that are evoked by the verbal behavior of other people. This capability does not show point-to-point correspondence with the verbal antecedent, it is reinforced by conditioned, social events, and it provides a foundation to learn previously inaccessible skills and competencies.
8. **Textual:** The lessons in this section are designed to teach the learner to become a proficient reader with both, decoding and comprehension capacities.

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