REFERENT-BASED INSTRUCTION
Taking the Arbitrary Out of Programming

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The Teacher Education Autism Model (TEAM) Center was established in Spring 2013 to provide intensive state-of-the-art programming for children and adolescents with Autism Spectrum Disorders premised upon Applied Behavior Analysis, specifically toward the development of verbal behavior to address communication, reciprocal and interactional skill deficits and associated challenging behavior. In addition to supporting the community, the TEAM Center located downtown San Antonio offers an opportunity for university students for an intensive supervised practicum situation with a clinical and research emphasis. The Referent-based Instruction procedure has been developed at the TEAM Center to make available intensive, accelerated, curriculum-based training.
Objectives

• To outline the framework for referent-based instruction
• To discuss procedures for effective implementation
• To demonstrate the effectiveness of referent-based instruction
OUTCOMES

• Identify opportunities in the natural environment for students to use language
• Transfer control across verbal operants
**BACKGROUND**

Skinner's (1957) analysis of verbal behavior brilliantly deconstructed language according to various controlling stimuli. The functional independence of verbal operants has been empirically demonstrated (Hall & Sundberg, 1987), but largely unsubstantiated (Grow & Kodak, 2010). This may be because multiple control of verbal behavior is the rule rather than the exception (Michael et al., 2011; Eikseth & Smith, 2011). For this reason, in the current paper we propose a verbal behavior curriculum based on establishing multiple control of various referents. Founded on the principles of incidental teaching, referent-based instruction (RBI) is designed to promote generative language.
RBI

Referent-based instruction (RBI) is a natural environment training (NET) model for verbal behavior instruction based in the principles of behavior analysis. RBI provides a framework for strengthening verbal behavior across four primary operants: mands, echoics, tacts, and sequels.
This curriculum is premised upon Drash and Tudor’s model of autism as a contingency-shaped disorder of verbal behavior; thus, to weaken autistic behaviors, our primary interest is in strengthening verbal operants. Using referents as a hub for developing verbal behavior provides an efficient and effective method of developing an individualized treatment plan based that is functional for the child.
RESEARCH QUESTION

To what extent does referent-based instruction increase the verbal behavior of children with autism spectrum disorders?
METHODOLOGY

Thirteen children received referent-based instruction at a university-based center for applied behavior analysis. Each participant received 90 minutes of RBI four days a week for 13 weeks. Instruction was individualized to the needs of the participant, but focused on the four primary verbal operants: mands, echoics, tacts, and sequelics.
RESULTS

Using the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP; Sundberg, 2008) as a pre- and post-test, we analyzed the effects of RBI. A Wilcoxon Signed-ranks test indicated that, after one semester of RBI, participants scored significantly higher on the VB-MAPP post-test ($Mdn = 65.5$) than when initially assessed on the VB-MAPP pre-test ($Mdn = 32.5$), $Z = -3.18$, $p = .001$, $r = .62$. 
Relevant Concept

**Behavioral Cusp**

A behavior that has consequences beyond the change itself... (that) exposes the individual’s repertoire to new environments, especially new reinforcers and punishers, new contingencies, new responses, new stimulus control, and new communities of maintaining or destructive contingencies (Rosales-Ruiz & Baer, 1997, p. 534).
Relevant Concept

**Behavioral Cusp**

**Criteria**

a) Access to new reinforcers, contingencies, and environments
b) social validity
c) generativeness
d) competition with inappropriate responses
e) number & relative importance of affected

**Relevant Concept**

**Pivotal Behavior**

A behavior that, once learned, produces corresponding modifications or covariations in other adaptive untrained behaviors.

Cooper, Heward & Heron, 2007, p. 59.
Relevant Concept

Preference Assessment

A procedure (structured interview, direct observation, systematic evaluation) for identifying stimuli (tangible items, activities) which have the potential as reinforcers for target behavior, e.g. verbal responses.
A referent is verbal behavior brought under the narrowing control of the relevant properties of a stimulus (after Skinner, 1953).
What is Referent-based Instruction?

• Generative instruction focused on teaching the operant class rather than specific targets

• Premised upon Skinner’s (1957) functional analysis of verbal behavior (VB), with particular attention to METS:
  – Mands (e.g., requesting)
  – Echoics (e.g., mimicking)
  – Tacts (e.g., labeling)
  – Sequelics (e.g., conversing)
Curriculum developed utilizing two task analyses of language:

– Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP)

– Assessment of Basic Language and Learning Skills-Revised (ABLLS-R)
RBI

• Sessions conducted by a lead behavioral technician and a facilitator supporting efficient decimated operant (stimulus-verbal behavior-consequence) training, generating ad hoc educational materials reflecting the sessions’ instructional flow, and collecting data

• Consideration of instructional topography (i.e., conducted in a spacious area with access to a variety of toys and stimulating materials for functional and imaginative play)

• Structured as milieu language teaching sessions initiated with an opportune preference assessment to identify referents that serve as a locus of control for METS, and may also function as potential reinforcers
Multiple control is established by converging METS around the referent.

Generalization is programmed through “loose teaching,” allowing METS to serve as behavioral cusps for related skills (i.e., play, social, group, etc.) developing stimulus control (i.e., listening, visual discrimination, etc.)

RBT stipulates a dynamic 90:10 ratio of natural environment teaching to discrete trial training. 90-minute sessions are broken down into 10-minute blocks composed of nine minutes of errorless teaching followed by a one minute fluency probe (see Figure 1).

RBT emphasizes game theory; Behavior techs make strategic programming decisions based on fluency probes.
Instruction emphasizes transfer of control across verbal operants.
Progress is evaluated using standard celeration charts.
Language development is measured in terms of a stimulus control ratio. 

*Child 3’s control ratio at intake (September 2013)*
Child 3’s control ratio at discharge (March 2014)

- Echoics: 31.7% (10)
- Tacts: 28.6% (9)
- Sequelics: 12.7% (4)
- Mands: 27% (8.5)

Control Ratio
Convergent Multiple Control of _______ Behavior
Michael, Palmer, & Sundberg, 2011.
Convergent Multiple Control of Verbal Behavior
Michael, Palmer, & Sundberg, 2011.