

A Data Based Longitudinal Study on the Emergence of a Tact
Repertoire in a Ten Year Old Non-verbal Child with Autism

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The purpose of this study was to analyze the conditions under which a nonverbal ten-year old boy with autism acquired a tact repertoire and how novel tacts emerged. The boy received communication training using a curriculum based on Skinner's (1957) analysis of verbal behavior. During five years of training he built a language repertoire equivalent to that of a three year old boy (a vocabulary of about 500 words, combining three to five words in short phrases, and using his language to talk mostly about the present). We categorized his language in basic verbal operants (mands, tacts, intraverbals, etc.) The tact repertoire he acquired and the novel tacts that emerged were analyzed within the continuum of his whole language acquisition.

Introduction

- o The purpose of this talk is to present the cumulative results of four years of intensive verbal behavior intervention on the acquisition of functional language, and in particular, the

development of a tact repertoire in a 16 year old boy with autism.

- o At the onset of the behavioral intervention Sam was nonverbal and did not have an echoic repertoire. Throughout five years of behavioral intervention Sam has built a verbal repertoire emerging within the three year age range.
- o At the present time Sam continues in the program and progress continues to be evident.
- o This presentation will describe the sequence of acquisition of language. A detailed presentation of his spontaneous language (tact repertoire) will follow.

Student

Developmental milestones

- o Sam was born in 1988. He weighed 7 pounds 5 ounces at birth and was the product of a normal full term pregnancy.
- o Motor milestones were achieved within normal limits. He was toilet trained by 4 years.
- o Sam babbled at 8 months and subsequently he learned a few words. However, by 18 months he had stopped talking. He also followed simple commands at 12 months but comprehension also underwent a regression at 18 months.
- o Language development was seriously delayed and deviant after 18 months of age.

- He had a history of numerous episodes of otitis media. Hearing thresholds tested in the normal range bilaterally.
- He had a history of sleep difficulties including nightmares and a history of significant behavioral and social difficulties.
- Sam was 3 years old when he was diagnosed by a pediatric neurologist with infantile autism.

Social/emotional development

- The most significant issue was his aggressive outbursts toward others and his vocal stereotypies which involved waving both hands in front of his eyes accompanied by a high pitch, loud vocalization “eeeeeee”; hitting his chest and flapping his hands; folding his ears and using his hands as visors to limit visual input.
- He resisted change, had frequent temper tantrums, and sometimes had unexplained panic attacks and unprovoked aggressive outbursts.
- He laughed or cried unexpectedly, and was difficult to comfort when he was upset.

School history

- From two to five years (nursery school years), Sam attended the TEACCH program.
- At five years of age, he attended a special needs class for children with autism in the public school system
- During all these years until he was 10 years old, he

received numerous hours of speech language therapy, which were aimed at teaching alternative ways of communication through an augmentative communication system.

- o From 3.5 to 5 years he received two hours a day of ABA instruction, from a group of professionals directed by Dr. Lovaas.
- o The family was discouraged by school professionals to continue with the ABA training, arguing that the child was overworked and needed rest after school hours.

Psychological testing

- o When he was 8 years old, the results of the Stanford Binet test indicated Sam to be functioning within the moderate to severe range of mental retardation.
- o At this time Sam was receiving language therapy using the Macaw electronic communication device with eight cells, each containing a Mayer-Johnson picture and the corresponding photograph. He consistently used the Macaw to request "eating".
- o During this testing, the psychologist observed that his socialization had deteriorated somewhat over the past 3 years (she had evaluated him previously).
- o By 10 years of age psychologists observed that his maladaptive behaviors increased and that there was an

apparent decline in all areas of functioning from the previous two years.

- o As a result of This assessment, the school reported that Sam needed a highly structured, small predictable classroom setting. As Sam engaged in much self-stimulatory behavior he also required continuous verbal and/or physical prompting to begin, resume, or complete tasks and activities. At times, Sam could become aggressive toward his peers and had to be directed so as to avoid injury to others.
- o The school psychological evaluation gave him the following classification (according to the DSM-IV Classification):

Axis I: Autistic Disorder, 299.0

Axis II: Moderate/Severe Mental Retardation,

318.0/318.1

Transition to the home-based ABA program

- o By 10 years of age, Sam was referred by the family lawyer to a pediatric neuropsychologist to assess his current level of functioning in order to ascertain whether home-based ABA therapy would be more appropriate than his current school placement.
- o The examiners observed that Sam functioned at the severely deficient range of nonverbal intellectual ability,

and also stated that there was an apparent decline in functioning from the 2 previous years.

- o The test scores in the Leiter International Performance Scale showed the following:

Mental Age = 1 year and 5 months

IQ = 14.68.

- o In the Vineland Adaptive Behavior Scales he scored the following:

Communication Domain 1 year 5 months

Daily Living skills domain 2 years 3 months

Socialization Domain 0 years 10 months

Adaptive Behavior Composite 1 year 6 months

- o Sam was 10.5 years old when he began a full-time home based ABA program in September of 1998.
- o The program began with 20 hours per week. These were gradually incremented to approximately 50 hours per week, including his recreational time.
- o He lives in a large metropolitan area, with his parents and his younger sister.

Description of the home-behavioral program

General characteristics of the home program:

- o Research-based intervention, based on the science of behavior analysis
- o Established clear objectives, and specific goals.

- Systematic teaching of each skill.
- This system measured learning - It evaluated the progress on a continuous basis, daily.
- Established a direct relationship between the intervention and the change in behavior.
- All behaviors taught were relevant to the child and to the family.
- The results were tangible to everyone.

Data Collection

See graph of yearly cumulative data (enclosed).

Description of the verbal behavior curriculum to teach language

- The curriculum to teach language was based on Skinner's functional analysis of language (1957).
- He specified different response forms according to their controlling variables, and identified them in seven basic verbal operants: Echoics, mands, tacts, intraverbals, tacts, textual, taking dictation, and copying a text.
- We taught Sam each one of these operants, one at a time.

Tact:

- This is a verbal response whose form is controlled by a nonverbal discriminative stimulus.
- The discriminative stimulus can be an object, action, or event. For example, a dog barks, and the child says "The dog is barking".

- Sam acquired his first tact four months after having acquired the first mand.

Description of the procedure to teach a tact repertoire

We taught Sam to name the object, person, action or event without the verbal antecedent "What is that?" or "What is she doing?" or "What happened?"

- The first stage consisted of presenting an echoic prompt simultaneously with the presentation of the object, action or event. When the child emitted the echoic response, he was praised.
- Second stage consisted of fading the echoic prompt until the child named the object, person, action or event without the echoic prompt. At this point we said the child was tacting.
- The child learned to tact because there was transfer of stimulus control from the echoic prompt and the presence of the object, to just the presence of the object alone.
- We taught tacting in the following order:
Objects, persons, actions, events.
- The teaching of each one of these different stages was done in a systematic way, presenting mass trials.

Cumulative VB achievements.

- See graph. It is on a separate folder, and it was sent as an attachment.
- Summary of Steve's graph of all of his VB acquisition

Summary of results

1998

- o Tacts of objects (level 1) acquired. Example, "cat", "shoe", "horse", "ball" etc. There is no emergence of tacts in the natural setting at this point.

1999

- o Tacts of objects (level 2) acquired. Example, "the house", "the table", "an airplane", "an ambulance". There is no emergence of tacts in the natural setting at this point.

2000

- o Tacts of objects and persons (level 3) acquired. Example, "This is a cat", "that is a shoe", "that's a horse", "that's a ball" etc. He acquired Yes/No as tacts. For example, "Is this a ball?" and he said "No, this is a car". There is no emergence of tacts in the natural setting at this time.

2001

- o Tacting is beginning to emerge. He greets people spontaneously.

2002

- o Tacting of objects and actions in the present tense are emerging in the natural setting.

2003

Tacting of events in the present tense are emerging in the natural setting.

2004

- o Tacting of events in the past tense are emerging

Verbal behavior log or diary.

- Anecdotal data were collected reflecting novel spontaneous vocalizations emitted by Sam.
- These vocalizations ranged from novel mands and intraverbals to tacts, autoclitics and conversational units.

Graph of mands and tacts

Examples of the emergence of a tact repertoire in the natural setting

February 15, 2002.

- Sd: Sam was in the car with me. We drove by the restaurant named "China Pavillion".
- R: Sam pointed to the restaurant and said: "Chinese Rice".
- C: I responded: "Yes, this is the Chinese restaurant. We eat Chinese rice there"
- Signed by the mother.

March 19, 2002

- Sd: There was a container with some money on the table.
- R: Sam picked up 5 dollars and said "5 dollars".
- C: I confirmed his response "Yes, your are right, those are 5 dollars".

Signed by Anna (teacher). The mother was present too and she heard it.

April 19, 2002

- Sd: I took a pencil from the draw. (The tip of the pencil was broken).

- R: Sam pointed to the pencil and said "pencil broken"
- C: I said: "you are right, the tip of the pencil is broken" and I took another pencil.

Signed by the teacher. She wrote the name of two more instructors who were present and who heard Sam talking.

April 25, 2003

- Sd: Maria and I were in the therapy room with him. Maria was coughing.
- R: Sam turned toward her and said "Maria is coughing."
- C: We both told him: "Yes, you are right. She is coughing."

Signed by Anna and María

April 25, 2003

- Sd: Sam was in the living room with several adults. His mother was sweeping the floor.

R: He turned to an adult and said: "She is sweeping the floor"

- C: He was acknowledged and praised for giving this response.

Signed by the mother who indicated that other adults were present and heard him.

April 27, 2004

- Sd: We were in the bus after playing basketball.
- R: He turned to me and said: "I went to play basketball".

C: He was acknowledged and praised.

Signed by Alex, his instructor

April 27, 2004

- Sd: We were in Steven's therapy room, getting ready to start working because he had just returned from the library with one instructor.
- R: "I went to the library".
- C: He was acknowledged and praised.

Signed by Alex, his instructor

Conclusion

- Verbal Behavior provided a methodology and a technique for teaching a tact repertoire to a nonverbal boy with severe language delays.
- Our specific intervention taught operants, thus, generalization was built in. It taught a specific response under a specific antecedent stimulus, regardless of place, people, or behavior. This fact might explain the emergence of the operants in the natural setting.
- We taught functional language.
- Expanded and original verbalizations of tacts emerged as he acquired other operants (mands, intraverbals, autoclitics) as well.
- It took four years for Sam to begin to tact in a more fluid manner.
- Research is needed to investigate the variables responsible for acquiring a tact repertoire, the ultimate goal in any language

intervention program.

Conclusion

Teaching language to Sam using the technology based on verbal behavior was effective probably because:

- VB taught sam to engage in language that was not evoked by verbal cues. He initiated the interactions
- VB provided a methodology and a technique for teaching. Instructors knew what to teach and when and how to teach it.
- VB taught operants, thus, generalization was built in. It taught a specific response under a specific antecedent stimulus, regardless of place, people, or behavior. For example, it taught Sam to request "Water" when deprived of water, or when thirsty. So whenever the condition of "thirst" appeared, the likelihood of Sam requesting "Water" was there.
- VB taught functional language.
- VB taught Intraverbal behavior which decreased echolalia.

Closing: Steven's picture

