**Poster Session #183 (10), ABA Convention 2005**
**Alpine Learning Group**
**Assessing Generalization from the Computer to 3-D Objects**
**using the *Discrete Trial Trainer* Computer Program**

## Summary / Response

This is a study of 2 autistic students to see if they can generalize what they learn on the DT Trainer to their physical world. One student did automatically generalize and the other student did not. There is a notion that autistic students do not generalize what they learn on the computer to their environment. The study result is consistent with customer feedback that some do and some do not automatically generalize. This result indicates that we need to teach generalization from the computer for some but not all students. Just as we have to teach 3D to 2D correspondence with many of our students with ASD, we will need to teach the correspondence from what they learn on the computer to their environment. Customer feedback indicates that they just need to teach some items to establish the correspondence and the students will generalize the skill just as they do with 3D to 2D. More studies are needed to fully characterize the generalization issue and to prove that generalization can be taught.

Software programs that use cartoons, drawings, busy screens, and single commands (SDs) would have more issues with generalization. What we find is that there is a strong correlation between effective methods off the computer and on the computer. For the same reasons that poor teaching practices off the computer will not lead to good generalization, poor teaching practices on the computer will also not lead to generalization. For computers to not have issues with generalization, we need to implement our effective face-to-face practices on the computer. The DT Trainer already includes some features to facilitate generalization. These features include randomized SDs, multiple exemplars, photo icons, non-distracting training environment, and multiple dimensions on a topic. These features probably are at least partially responsible for the level of generalization that is currently taking place.

We will add some additional generalization support to further enhance automatic generalization and make teaching generalization where necessary from the DT Trainer an intuitive and easy step for teachers and parents.

We thank the staff of Alpine Learning Group for this preliminary study and feedback that helps demonstrate the efficacy of the product and drives further improvements to better facilitate learning for these very special individuals.

Karl Smith, Accelerations Educational Software

Slide 1

# Assessing Generalization from the Computer to 3-D Objects using the *Discrete Trial Trainer* Computer Program

Jaime Schilling, Hannah Hoch,
Kate Lengel, Bridget A. Taylor


Slide 2

## Introduction

- Stimulus generalization refers to previously learned responses occurring in the presence of similar but different stimuli. Frequently, individuals with autism may not readily generalize learned responses to new or different stimuli (Stokes and Baer, 1977). In many cases, in order for skills to generalize, systematic procedures to enhance generalization should be incorporated into the program.
- The *Discrete Trial Trainer* computer program teaches students to receptively identify a pictorial or textual stimulus within a given lesson. The program teaches such skills as number concepts (e.g., adding, sequencing), identifying colors, money (e.g., identifying coins, identifying amounts), and body parts (e.g., identifying, functions).
- Skills are taught on the *Discrete Trial Trainer* using a series of positional and size prompts and are faded systematically according to a criterion set by the user of the program. Computer mediated verbal praise occurs after every correct trial and after a predetermined set number of correct trials the student earns visual reinforcement (a game or short film).

Slide 3

# Purpose

- To investigate whether responses learned by students with autism via a computerized instruction program (*Discrete Trial Trainer*) would generalize to 3-D objects.

# Method

Participants and Setting:

- Vince, an eight-year-old male with autism and Andrew, a three-year-old male with autism who attended a behaviorally based school program for students with autism
- Sessions were conducted in two different classrooms in the school building, on the computer (training site) and at the students' desks (generalization site).

Slide 4

Materials:

- *Discrete Trial Trainer* computer program (*Discrete Trial Trainer*, 2002, (803) 233-0541, Columbia, SC 29201)
- 3-D representations of computer stimuli: color copies of $20.00, $50.00 and $100.00 bills, color cards (yellow, blue, and purple), and distractor stimuli.

Dependent Measure:

- Percentage of correct responses during probe sessions (without reinforcement or error correction) at the students' desks with 3-D stimuli.

Design:

- Multiple baseline across targets

Interobserver agreement:

- Calculated for 30% of the sessions. Mean= 100%

Slide 5

# Procedures

Baseline:

- Probe sessions were conducted on the computer using the *Discrete Trial Trainer* program and at the desk using 3-D stimuli (e.g., color photocopies of $20.00, $50.00 and $100.00, or color cards)

Intervention:

- Andrew, the three-year-old participant, was taught the skill of identifying colors. Vince, the eight-year-old participant, was taught the skill of identifying $20.00, $50.00, and $100.00 bills.
- The first target was taught using the *Discrete Trial Trainer* computer program. When the student erred on a response, the program provided prompts which were systematically faded within the computer program.

Slide 6

- Probes using the test function of the *Discrete Trial Trainer* program were conducted 3-4 times per week.
- Probes using 3-D stimuli were conducted 2-3 times per week.
- Upon two days of probes at 100% on the computer, the target was considered to be mastered and the second target was put into treatment.
- Learned targets were maintained with probes on the computer and at the desk.

Slide 7

# Results

- The skills learned by Andrew did not generalize from the computer to 3-D stimuli (identifying colors).
- The skills learned by Vince (matching text to stimuli) did generalize from the computer to 3-D stimuli.

Slide 8

# Discussion

- The results of the study suggest that in one case generalization did occur, whereas in another case, generalization to novel stimuli did not occur.
- In one case, where a verbal and textual discriminative stimulus was given, the student was attending only to the textual stimulus. Probes at the desk were conducted only with a verbal discriminative stimulus. When this was realized, a probe at the desk using a textual stimulus (matching the phrase “twenty dollar bill” to a twenty dollar bill) revealed that this skill had generalized from the computer to 3-D objects.
- It is important to incorporate generalization into the learning of a skill. “Train and hope” (Stokes and Baer, 1977) is not the most effective way to program for generalization.

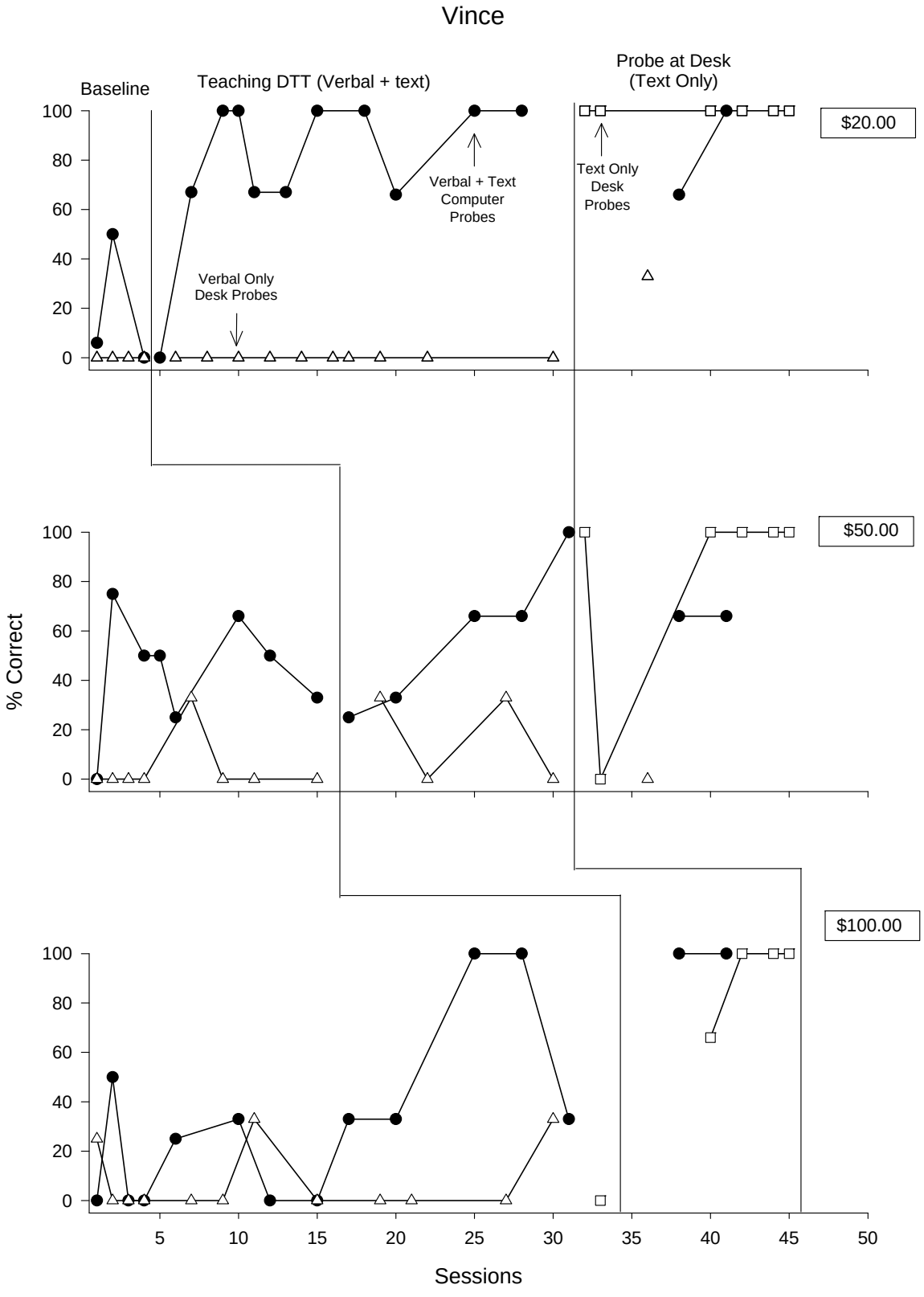
Slide 9

# Discussion

**(Cont'd)**

- Some ways of incorporating generalization include: printing the computer screen and using these exact stimuli to teach responses at the desk, adding reinforcement to probe sessions in order to strengthen correct responding, pairing the instructor's voice with the computer generated voice, and conducting teaching sessions on the computer and with 3-D stimuli simultaneously.
- This study suggests that children will respond differently to computer mediated instruction.

**Poster Session #183 (10), ABA Convention 2005**
**Alpine Learning Group**
**Assessing Generalization from the Computer to 3-D Objects using the *Discrete Trial Trainer* Computer Program**



**Poster Session #183 (10), ABA Convention 2005**
**Alpine Learning Group**
**Assessing Generalization from the Computer to 3-D Objects using the *Discrete Trial Trainer* Computer Program**