

# Moscow State University of Psychology & Education

10.25.19

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Co-Founder, AnswersNow

# Sarah Dooley Center for Autism



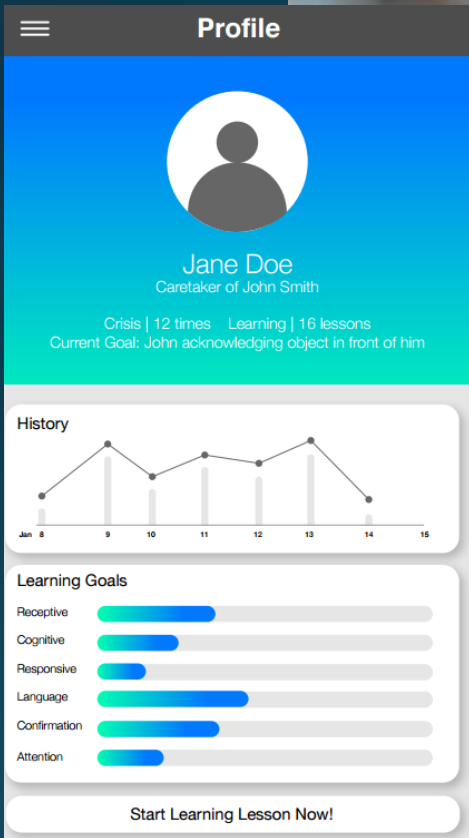
Convenient

Autism

Support

for families

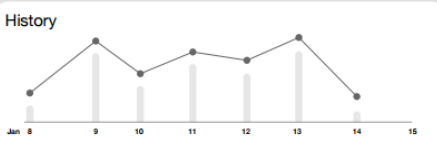
**Profile**



**Jane Doe**  
Caretaker of John Smith

Crisis | 12 times   Learning | 16 lessons  
Current Goal: John acknowledging object in front of him

**History**



Date	Value
Jan 8	1
9	4
10	2
11	3
12	2
13	4
14	1

**Learning Goals**

- Receptive:
- Cognitive:
- Responsive:
- Language:
- Confirmation:
- Attention:

Start Learning Lesson Now!



**AnswersNOW**


**911 | Emergency Situation**

Opportunity for line with description of specific situation

- 1) Stop talking
- 2) No demands
- 3) Step back

Is it working?



dreyfus@gmail.com

Are you ready to start?

Who are you without language?

The answer to a question  
never asked.

Antonio Demasio

'IDIOSYNCRATIC AND ENGAGING'  
*THE TIMES*

# DESCARTES' ERROR



## ANTONIO DAMASIO

'A TOUR DE FORCE OF SHEER REFLECTIVE  
*TIMES LITERARY SUPPLEMENT*

REVISED EDITION WITH A NEW INTRODUCTION

A NEW YORK TIMES BOOK REVIEW EDITORS' CHOICE

## ANTONIO DAMASIO

Bestselling author of *DESCARTES' ERROR*

# *The FEELING of* WHAT HAPPENS

BODY AND EMOTION  
IN THE MAKING OF CONSCIOUSNESS



'ONE OF THE BEST BRAIN STORIES OF THE DECADE.'  
*THE NEW YORK TIMES BOOK REVIEW*

# Theory of consciousness

Layer	Characteristic	Lifeform
Higher extended consciousness	Possesses complex language, strong memory, sense of self, conscience, art science	Modern humans
Extended consciousness	Possession of some language skills, limited sense of autobiographical self, limited short/long term memory	Neanderthals, chimpanzees, dolphins
Core consciousness	Conventional memory, strong sense of self, No ability to use complex language	Higher mammals
Consciousness of self	Detect changes in self, Rudimentary memory	Fish, reptiles, Primitive mammals
Proto self	Wakefulness, Image making, object detection	Simple animals







“No black  
scorpion is  
falling upon  
this table”

Alfred Whitehead (1934)



VERBAL  
BEHAVIOR



B. F. Skinner

# Verbal Behavior...

- Is behavior whose reinforcement is mediated by another person.
- The effect a speaker has on a listener
- Verbal Behavior Analysis
  - “Is a subfield within basic and applied behavior analysis devoted to researching and identifying sources and instructional procedures that produce functional verbal repertoires when they are missing”
    - Greer, 2007, VBA p.2



# Verbal Behavior Developmental Theory

Verbal Milestones	Effects on Independent Functioning
Pre-listener	Total dependency. Entrance to the social community not possible
Listener status	Still dependent BUT entrance into social community possible. Can respond to others speaking to them (Follow directions, tasks etc.)
Speaker Status	Can govern others behavior through talking.
Speaker-listener exchanges	Basic talking/listening skills.
Speaker-as-own-listener Status	YOU are born...

# Speaker v. listener

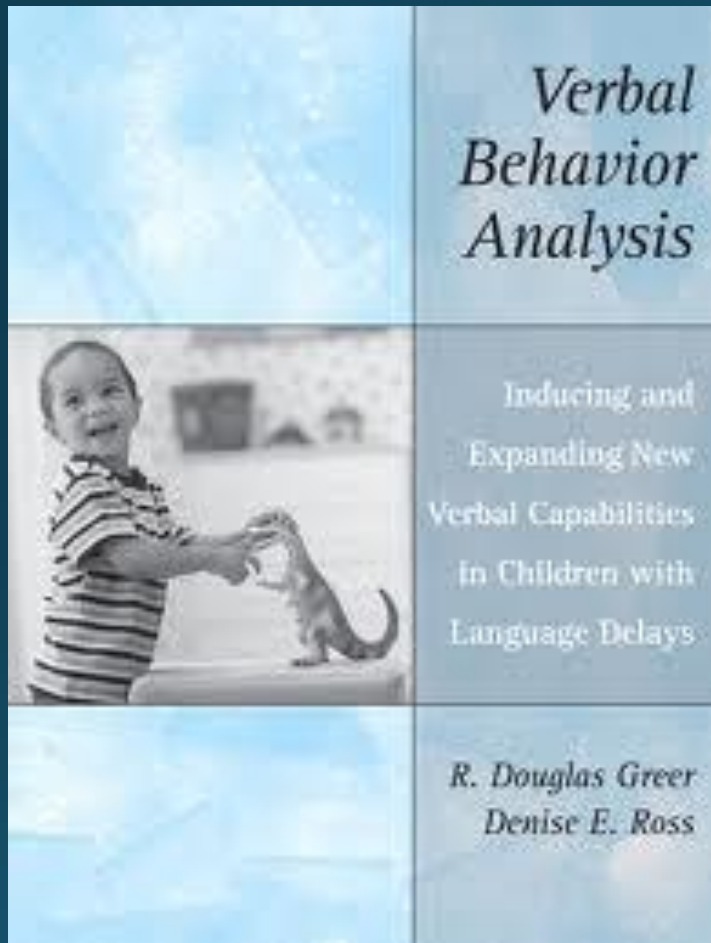
- Speaker
  - Someone who can govern or direct the behavior of others using various topographies of verbal behavior or language as a tool.
    - Vocal, gesture, sign, text
- Listener
  - Someone who is affected by the verbal behavior of others



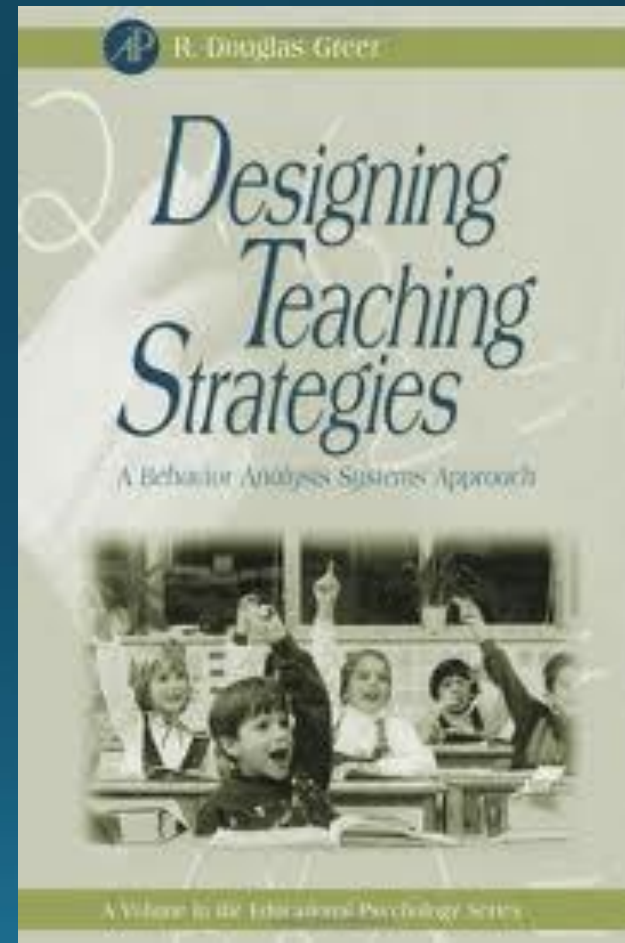
# Verbal Milestones

- Pre-listener
- Listener
- Speaker
- Speaker-Listener exchanges with others
- Listener-as-own-speaker
  - Say-do
  - Conversational units
  - Naming
- Reader Status
- Writer Status
- Writer as Own Reader
- Verbal Mediation for Solving Problems

# Verbal Behavior Analysis (2007)



# Designing Teaching Strategies(2002)



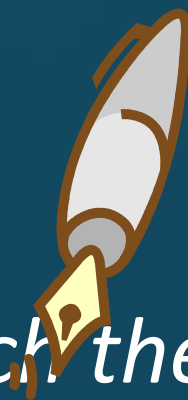
How many of you are familiar with B.F. Skinner's analysis of verbal behavior?

Show of hands please.

# How is this different from other theories of language development?

- Based on Function and *not* Form
- Focus is placed on the relationship of a spoken word and the environmental context around it rather than its relationship to linguistic structure

For example...



Pen!

*How do we teach the word:*



Pen



Pen!

What do you write with?

Pen!

# Verbal Operants

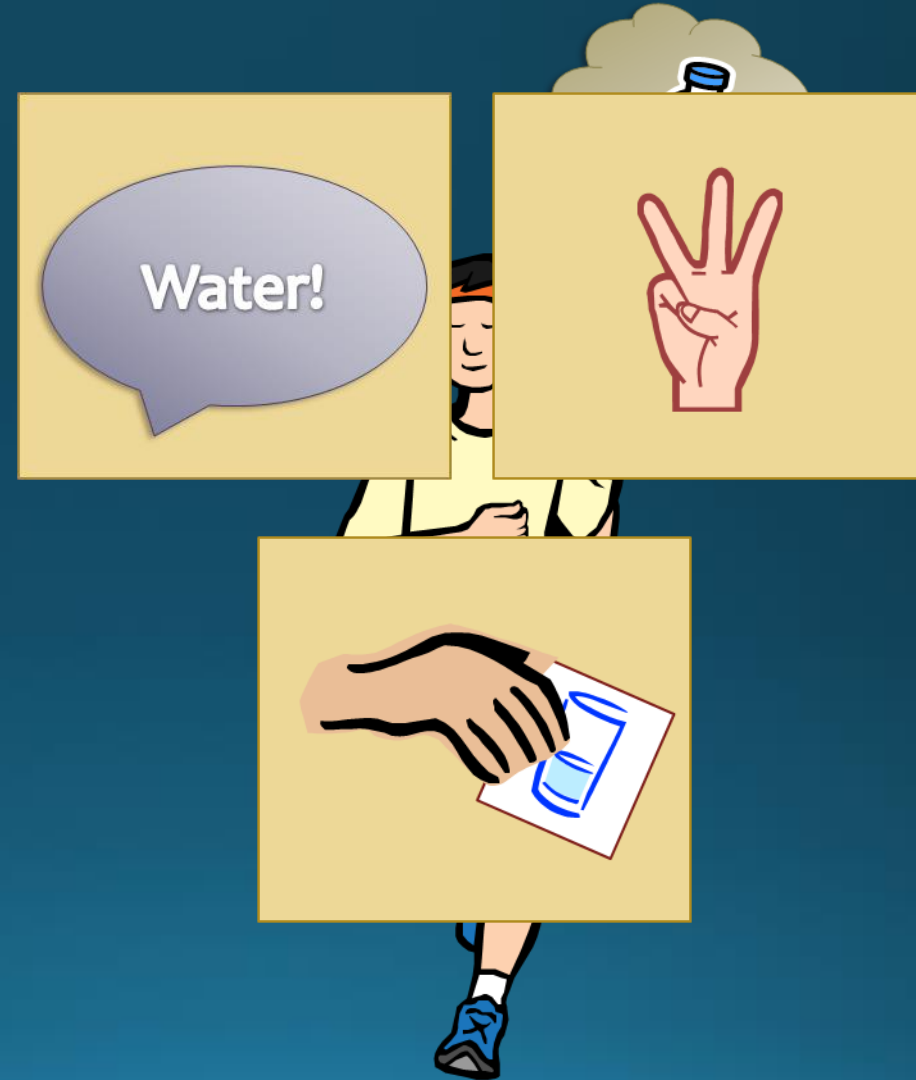
*Examples*

# Mand

- A “mand” is essentially a request
- It is defined by:
  - A motivation for something, and
  - It can be spoken, signed, or delivered with PECS

# Mand for an item

- Context
  - Motivation for Something
- Behavior
  - Vocally ask
  - Sign
  - Give an icon

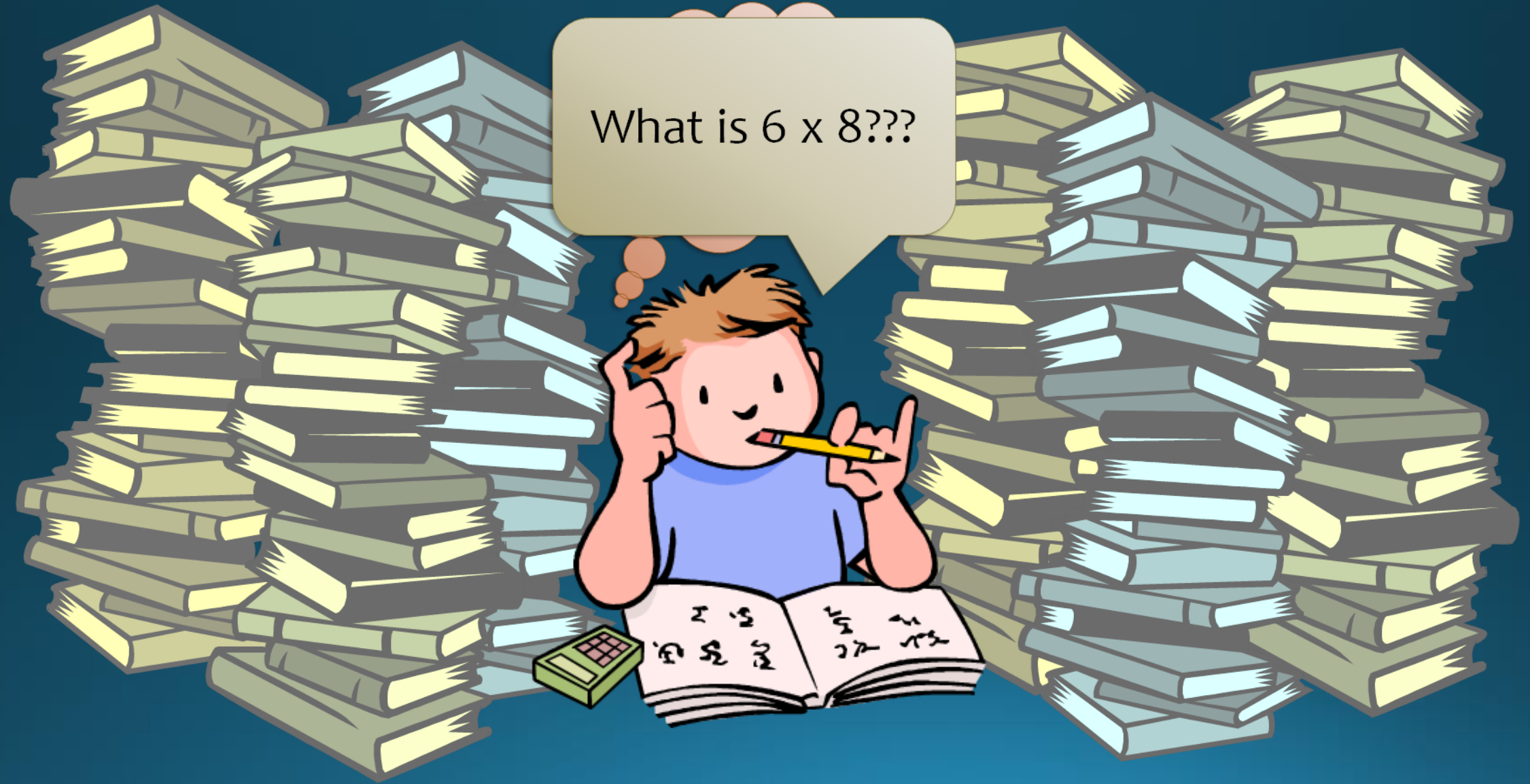




# Mand to stop something aversive



# Mand for information



What is  $6 \times 8$ ???

# Mand for attention

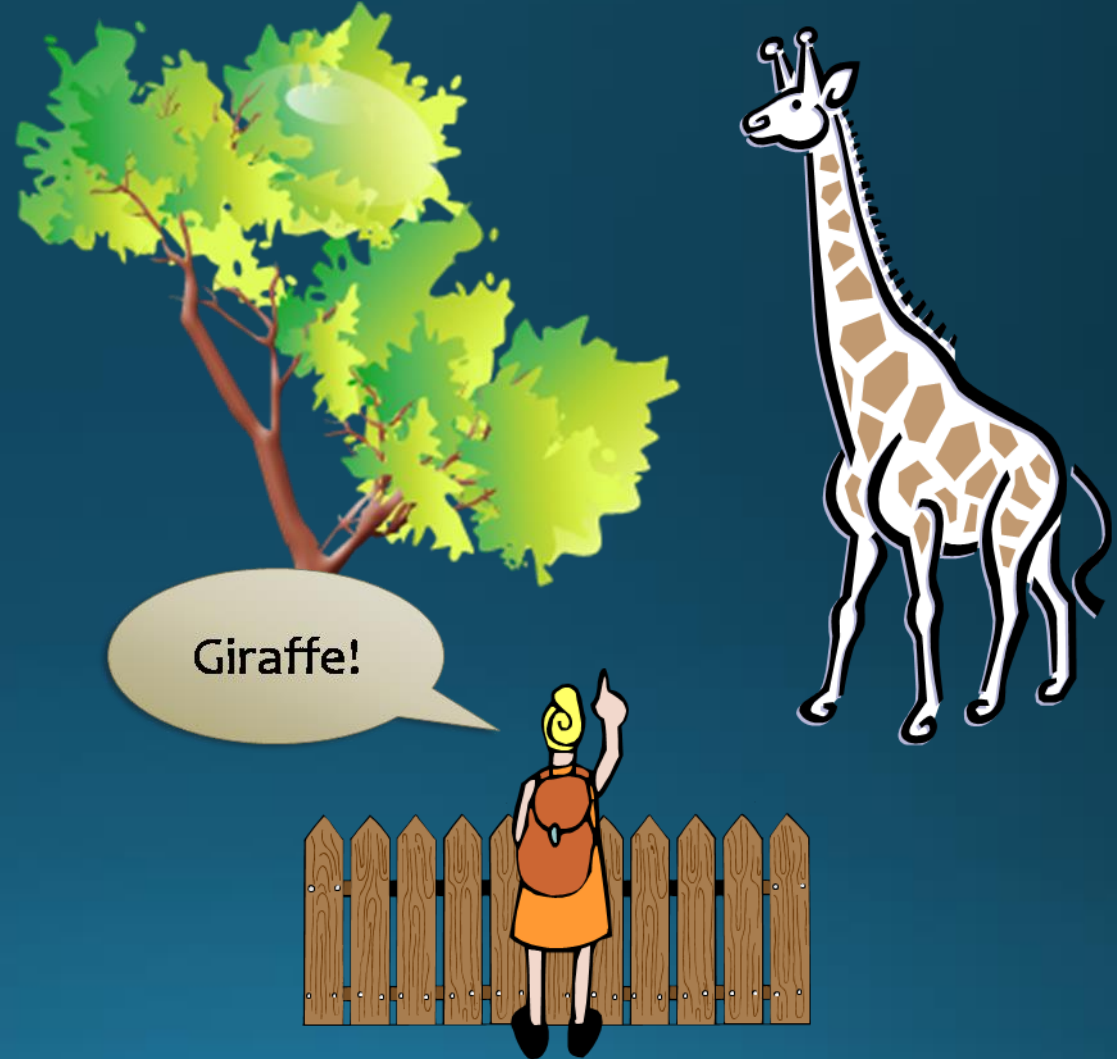


# Tact

- A “tact” is essentially a label
- It is defined by:
  - Sensing something, and
  - It can be spoken or signed

# Tact an object

- Context
  - Any nonverbal stimulus
- Behavior
  - Vocally say
  - Sign



# Tact an action



# Echoic

- An “echoic” is what it says that it is – it’s echoing
- It is defined by:
  - Something spoken to the student
  - A Matching Spoken response

# Echoic





# Intraverbal

- An “intraverbal” is best summed up as conversational speech
- It is defined by:
  - Something spoken to the student
  - A *Non-Matching Spoken* response

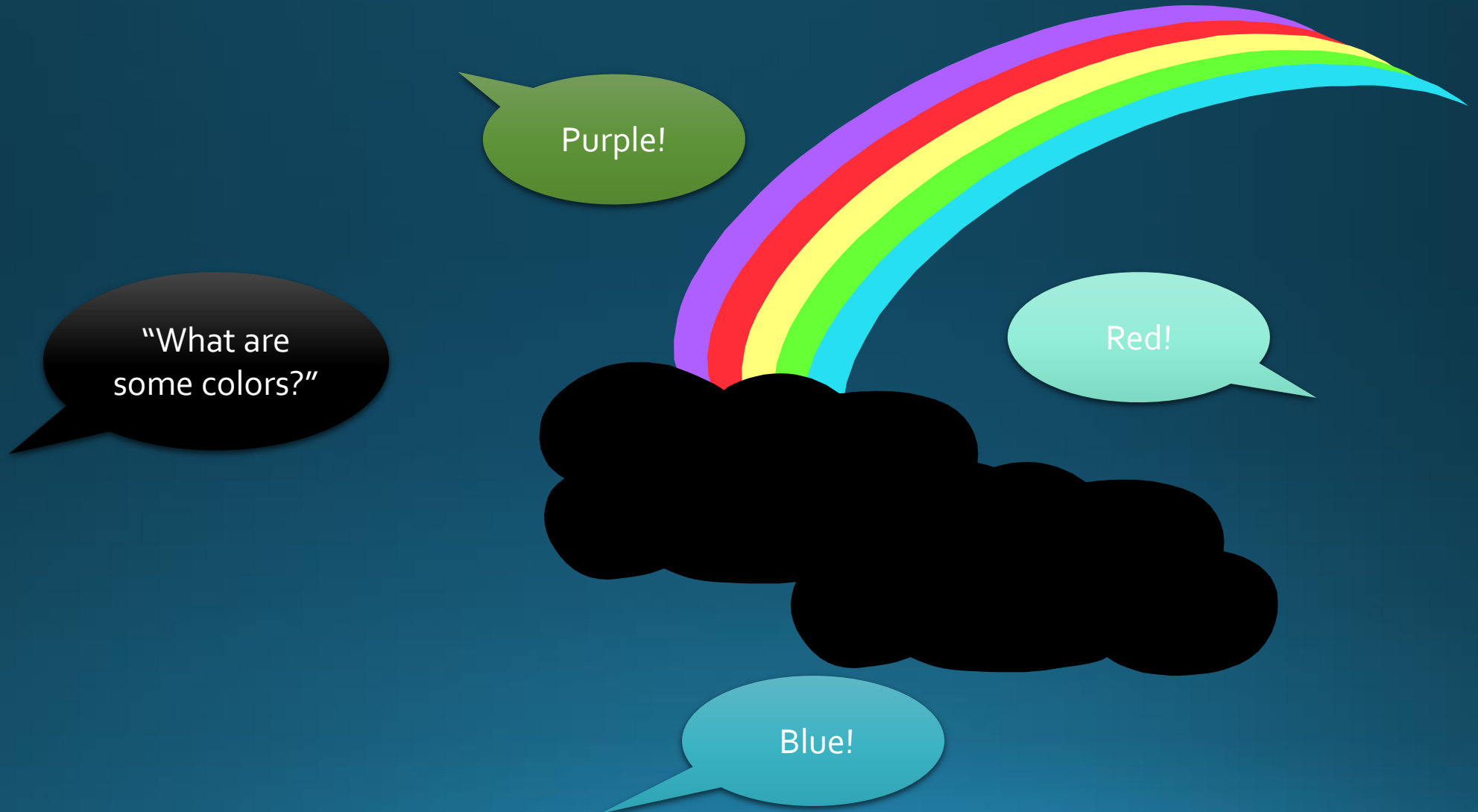
# Fill-in's as Intraverbals

"Twinkle,  
twinkle,  
little..."

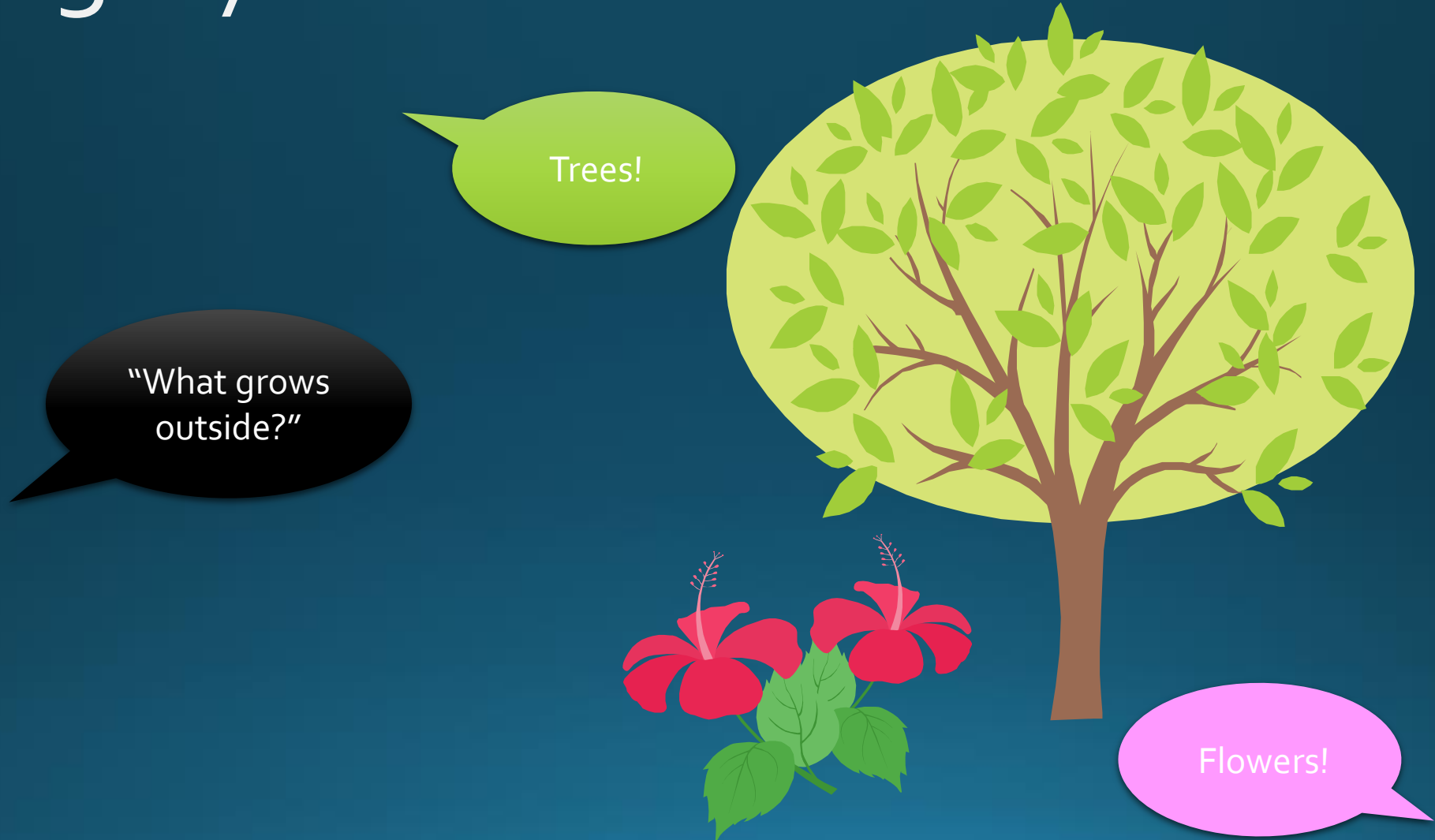
Star!



# “Wh” Questions are Intraverbals



# Category Questions as Intraverbals



# Listener Behavior

- “Listener Behavior” includes what is traditionally called receptive language
- It is defined by:
  - Something spoken to the student
  - A nonverbal action by the student

# Listener Behavior

- Examples include:
- Following an explicit direction
  - As in, “Close the window”
- Following an implicit direction
  - As in, “It’s cold in here”



# Verbal Behavior Developmental Theory

# Research Based Tactics

Learn units

Contingent reinforcement

Planned ignoring

Brief time-out from reinforcement

Time out toy/item

Good behavior ribbon

Interspersal of known items

Response prompts

Response delay

Modeling

Peer reinforcement conditioning

Visual feedback

Generalized reinforcers

Tokens

Preferred activities for reinforcement (Premack Principle)

Activity deprivation as Establishing Operation

Extrinsic stimulus prompt

Intrinsic stimulus prompt

Matching-to-sample as prerequisite repertoire training

Topography of response changed for same function

Interrupted chain as establishing operation for mands



# Protocols (Research Based Interventions)

# Protocols for inducing missing capabilities

- ...the acquisition of an ability that allows one to learn components of a previously inaccessible repertoire.
- Behavioral Cusp: changes in person-environment interactions that enable multiple new interactions  
(Rosales-Ruiz & Baer, 1997)
- Speaking
- Listening
- Walking
- Fluent reading

# Protocols

## Listener

- Basic Attentional Programs
- Listener Literacy
- Listener Emersion
- Conditioning Visual Tracking
- Conditioning Voices for Reinforcement
- Auditory Matching
- Listener Component of Naming

# Basic Attentional Programs

- Sit
- Sit still
- Look at me
- Do this (Imitation)
- Do this as Generalized Imitation (See-Do)

# Listener Emersion

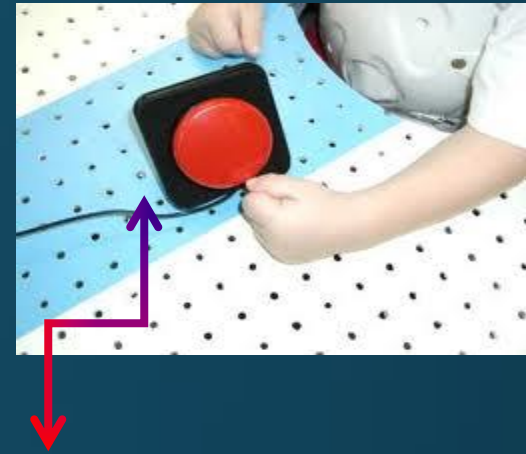
- Identify 16 listener commands
    - Come here, touch nose
  - 4 nonsense commands
    - Blah blah, snooki, blum, smooosh
  - Arrange into sets of 5 (4 listener/ 1 nonsense)
  - Using errorless learning, teach student correct responses
  - Fade using 1, 2 sec delays
  - Track progress graphically using decision tree protocol
- 
- Greer, R.D., Chavez-Brown, M., Nirgudkar, A.S., Stolfi, L., Rivera-Valdes, C.L. (2005) *European Journal of Behavior Analysis*

# Conditioning Visual Tracking

- Select 3 identical semi-opaque cups
  - Select preferred items (cookies etc.)
  - Place preferred item under cup and rotate the cups (Think of the 'hidden quarter game')
  - A correct response is when student picks up correct cup and gets item.
- 
- Keohane, Greer & Ackerman (2006b)

# Conditioning Voices for Reinforcement

- Stimulus-Stimulus pairing procedure
- Student places hand on a button switch
- He is reinforced in a pair-test sequence
  - 5 sec. reinforcement
  - 5 sec. test
  - 5 minute session
- If the student stops playing the tape, the interval is started over until the student holds the button for all 5 sec.
- Criterion: 90% of 5 sec. intervals over 5 min. free play probe
- Greer & Keohane (2005), Greer, Keohane, Ackerman, Kang & Walsh, 2006; Greer, Keohane & Delgado, 2006; Keohane, Greer, Nuzzolo, Kang, Solow, Bayard, Reilly & Walsh, 2006



# Auditory Matching

Auditory Matching Materials		
Phase	Target Items	Non-exemplar Items
Phase 1: Sound v. No Sound	Baby crying, cat meowing, phone ringing	No-Sounds
Phase 2: Sound v. White Sound	Baby crying, cat meowing, phone ringing	White Sound
Phase 3: Sound v. Sound	Baby crying, cat meowing, phone ringing	Water running, Trumpet playing, Clapping Hands
Phase 4: Word v. Sound	Juice, Bus, Pen	Water running, Trumpet playing, Clapping Hands
Phase 5: Word v. Nonsense Word	Juice, Bus, Pen	Baba, Tete, Aha
Phase 6: Word v. Word	Juice, Bus, Pen	House, Clock, Door
Phase 7: Word v. Word	Mouse, Pen, Hat	House, Ten, Pat



Auditory Matching

Auditory Matching

# MEI (Multiple Exemplar Instruction)

- Match
  - Point
  - Tact
  - Intraverbal
  - Write (Production)
  - Spell (Production)
  - Circle/Underline (Selection)
- 
- Arrange sequence so that there are an equal number of presentations
- 
- Greer, R.D., Stolfi, L., Chavez-Brown, M., & Rivera-Valdes, C.L. (2005) *Analysis of Verbal Behavior*
  - Stokes & Baer (1977), Horner, Sprague & Wilcox (1982), Hughes (1992)

# Multiple Exemplar Instruction

**Protocol/Instructional Procedure-Multiple Exemplar Instruction Across Saying and Writing** (Greer & Speckman, In Press; Greer, Yuan, & Gautreaux, 2005).

<b>Prerequisites</b>	<b>Probe</b>	<b>Procedure</b>	<b>Criterion</b>	<b>Educational Outcomes</b>	<b>What if the procedure didn't work?</b>
Pre-listener, listener, speaker, emergent reader, emergent writer components. Basic listener literacy, instructional control, etc. Print stimuli is conditioned, books are conditioned	Probe written and vocal spelling for novel words. After the intervention, probe the words again (these words are not taught in the intervention).	MEI across saying and writing is implemented in which students are taught to spell words vocally and in written form.	Criterion for MEI is 90% for 2 consecutive sessions. Criterion for the probe is 90%	Students can now spell novel words in the written response and in the vocal response. Students can spell words in both responses without being taught in each response. In other words, students can be taught to spell a word in written form, and they can spell it vocally without direct instruction.	Continue to teach using MEI across saying and writing. Try increasing EO, implement a selection response (students spell with letter tiles), typing response.

MEI (Multiple Exemplar Instruction)







MEI







# MEI (Multiple Exemplar Instruction)

MEI

# Protocols Observing

- Sensory Matching
- Conditioning Books & Toys to Replace Stereotypy
- Conditioning faces
- Conditioning for Voices
- Conditioning 3D/2D stimuli

Level 1	Basic Mand Teaching Procedure	Basic Tact Teaching Procedure
	Echoic-to-Mand	Echoic-to-Tact
Establishing Operation	Student is deprived of cookie before session 	Student is R+ by attention (Brief deprivation) 
Antecedent Stimulus	Teacher shows child cookie and says "Cookie" Waits 3 sec. 	Teacher shows child a picture of a ball, says "Ball" and waits 3 sec. 
Student's response	Student says "Cookie" within 3 sec. 	Child says "Ball" within 3 sec. 
Consequence	Teacher gives student small piece of cookie.	Teacher says "Awesome", and provides opportunity to mand

Level 2	Basic Mand Teaching Procedure	Basic Tact Teaching Procedure
	Echoic-to-Mand	Echoic-to-Tact
Establishing Operation	Teacher waits until cookie is consumed before next presentation. 	Student is R+ by attention (Brief deprivation) 
Antecedent Stimulus	Teacher shows child cookie and waits 3 sec. 	Teacher shows child a picture of a ball waits 3 sec. 
Student's response	Student says "Cookie" within 3 sec. 	Child says "Ball" within 3 sec. 
Consequence	Teacher gives student small piece of cookie.	Teacher says "Awesome", and provides opportunity to mand



Rapid Motor Imitation

Rapid Motor Imitation

# What do we know?

- BETTER INSTRUCTION
- Vandalism and truancy decreased when instruction improved and resulted in better academic skills (Sulzer-Azaroff & Mayer, 1986)
- MORE INSTRUCTION
- Assaultive and self-injurious behaviors eliminated by multiplying daily learn unit presentations (Kelly & Greer, 1992; Martinez & Greer, 1997)

# Developmental Cusps

# Pre-listener

- Total
- Individual  
other
- Interco  
possi



nt on

re not

# Listener Status

- Individuals can perform verbally governed behavior
- They can comply with instructions and avoid negative consequences while gaining socially appropriate skills.
- They can enter social community and while they are still dependent, can contribute to the well-being of their social community.

# Speaker Status

- Individuals can govern consequences in their environment through mediating the behavior of others (Help me, eat please, toilet, jacket etc.)
- The capacity to be a part of the social community is hugely expanded.

## Speaker-Listener Exchanges with Others (Sequelics and Conversational units)

- Individuals respond as speakers and listeners to intraverbals including impure tacts, “what is that? And impure mands, “What do you want?”
- As a listener, they are reinforced by speaker responses.
- They emit conversational units when they are reinforced as both speaker and listener.
- The individual is reinforced as a listener by sensory extension and as a speaker by the behavior of the listener.

# Speaker-as-own-Listener

- Three types of speaker-as-own-listener identified by research:
  - Say-do – First I do this, then I do that.
  - Self-talk – child functions as both speaker and listener in imaginative play
  - Naming – Individual can learn words as a listener and use them as a speaker or learn words as a speaker and use them as a listener.



# Reader Status

- Individuals with reader repertoires greatly extend their sensory experiences across time, distance and accessibility to the speaker (writer)
- Reader may use material without the time-constraints of a speaker-listener experience.
- The writer's advice is under the reader's control without the writer being present.

# Writer Status

- A writer can control environmental contingencies of a reader across seconds or centuries.
- This is an expansion of speaker skills but does not require a listener to be present.

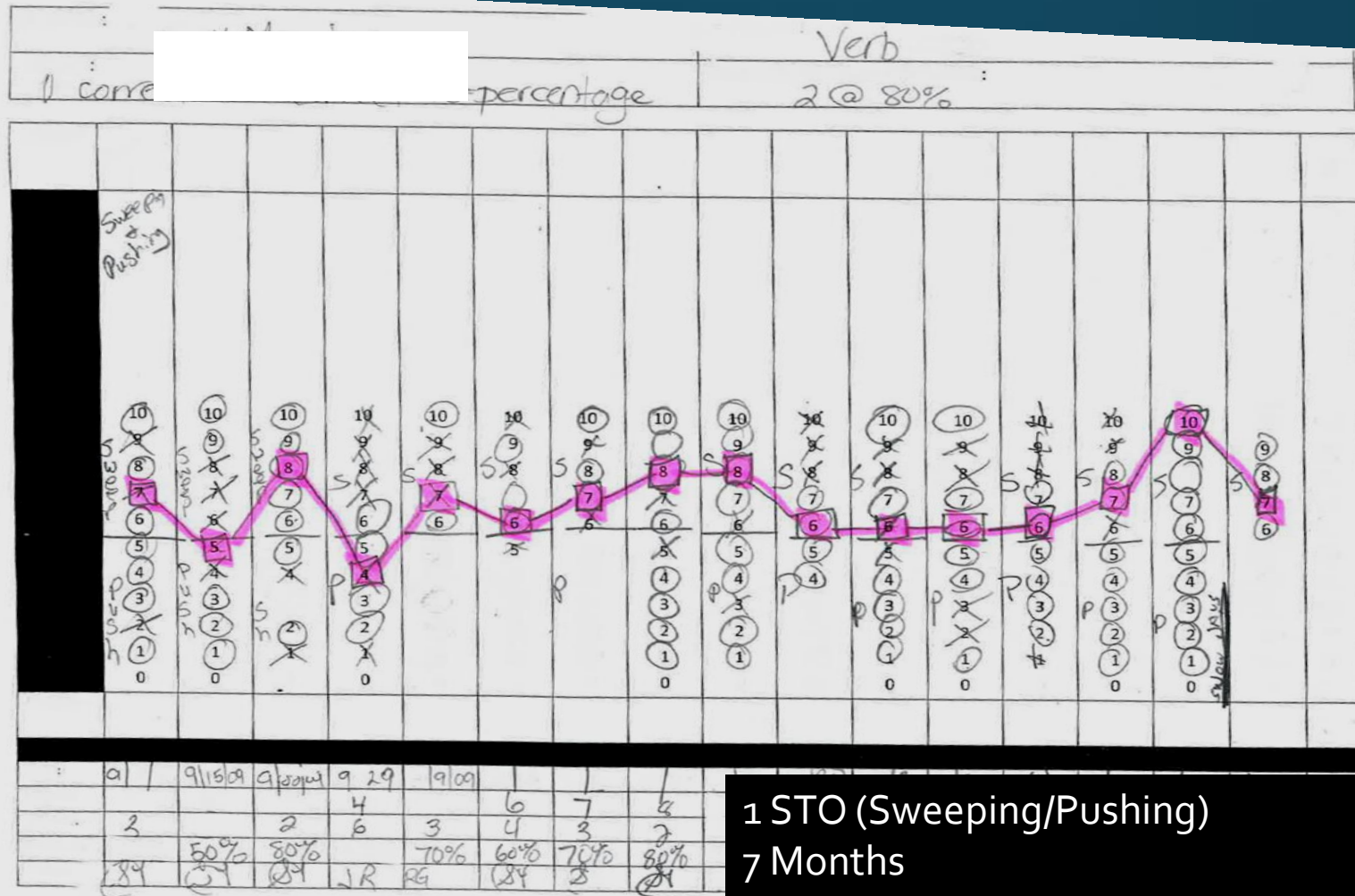
# Writer-as-own-Reader Self-Editing Status

- Writers can read their own writing from the perspective of a potential audience (listener).
- Writing can be geared towards different audiences.

# Verbal Mediation for Problem Solving

- A sophisticated self-editor whose behavior is governed by verbal expertise in a specific community
  - Scientists, programmers, doctors, engineers, mathematicians, university professors 😊
- Individuals can solve increasingly complex problems using precise verbal definitions.

# Data Collection



# Data cont.





# Probe Data

STUDENT:	[Redacted]																PROGRAM:	Category		
LEGGEND:	[Redacted]																DATA COLLECTION	No Answer		
TARGET	[Redacted]																			
Prompts:	[Redacted]																			
Date:	9-11	9-16	9-24	10-1	10/2	10/9	11-11	11/20	11/23	12/4	12/10	12/14	1/4/10	1/21	1/25	2/17	2/25	3/10	3/15	3/23
#Correct	10	0	0	5	0	0	0	1	4	1	0	2	1	0	0	0	0	0	0	0
#Incorr.	0	10	10	5	10	10	10	9	6	9	10	1	1	0	0	0	0	0	0	0
%Correct	100%	0%	0%	50%	0%	0%	0%	10%	40%	10%	0%	20%	10%	0%	0%	0%	0%	0%	0%	0%
Initials:	SC	SC	SC	SC	RL	SC	JA	MM	MM	MM	MM	MM	V	MM	MM	MM	MM	MM	MM	MM

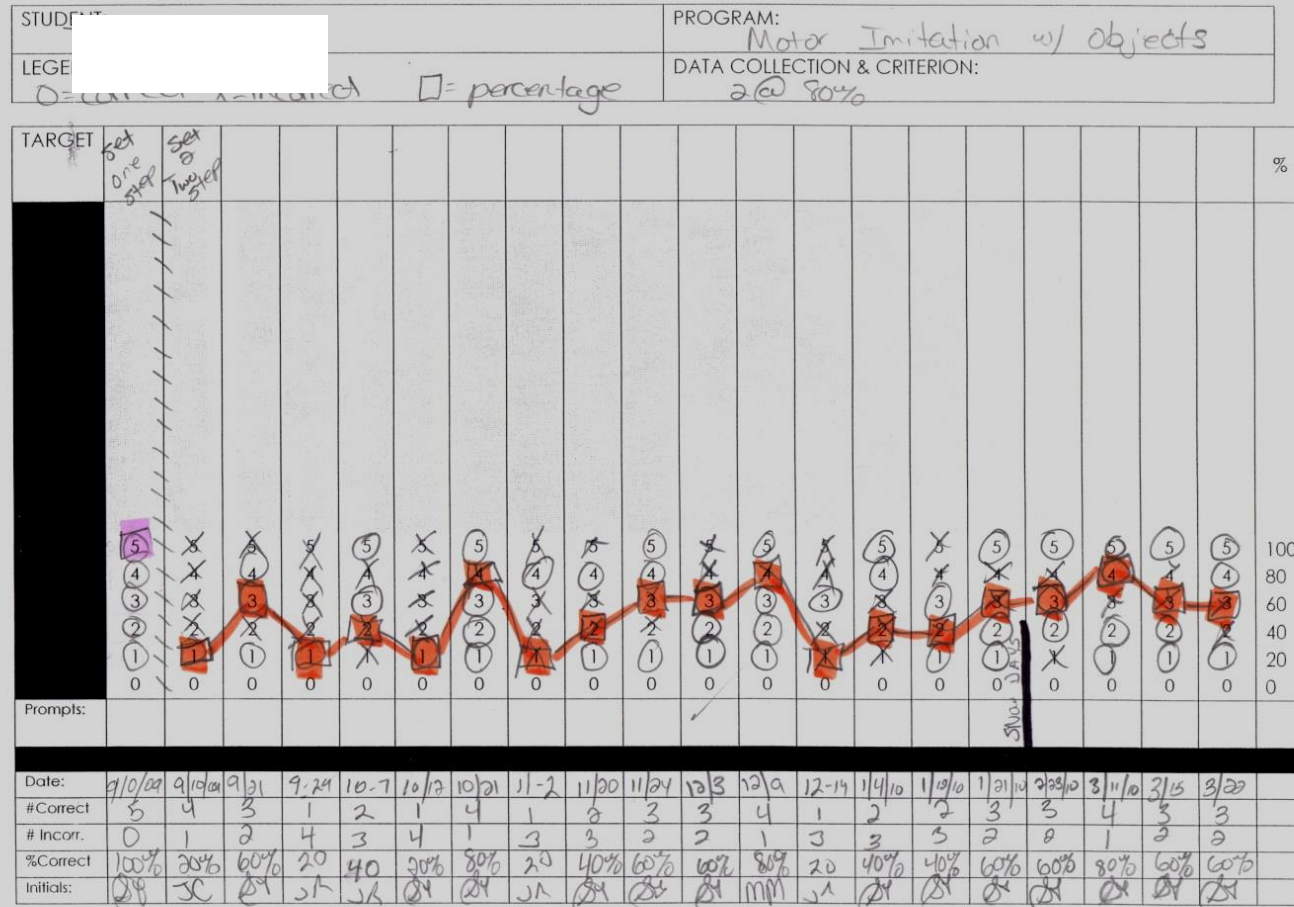
STO – Animals/Plants  
8 Months



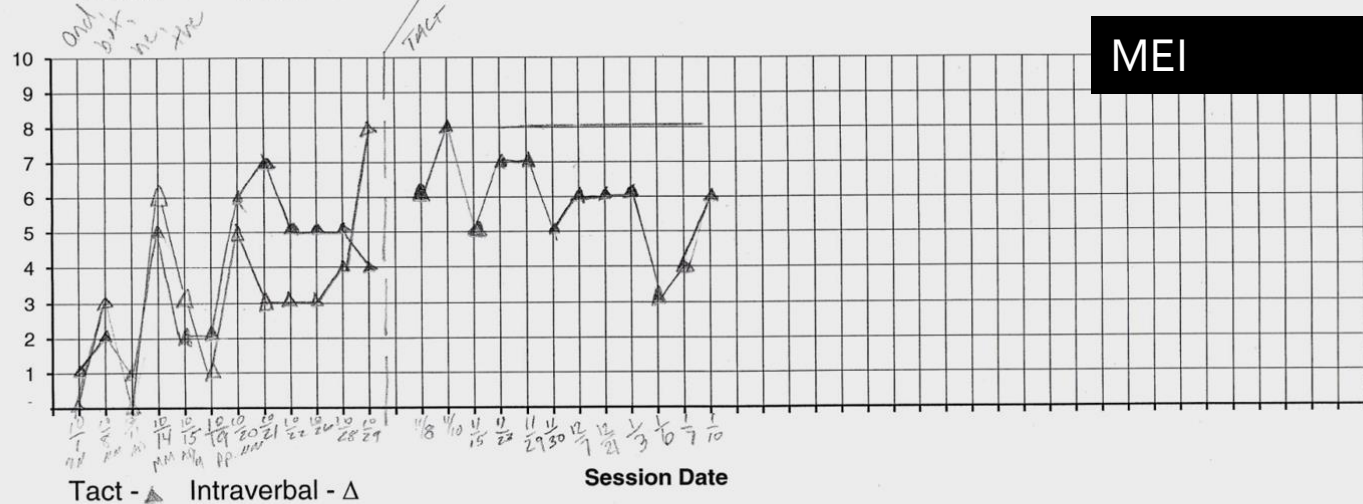
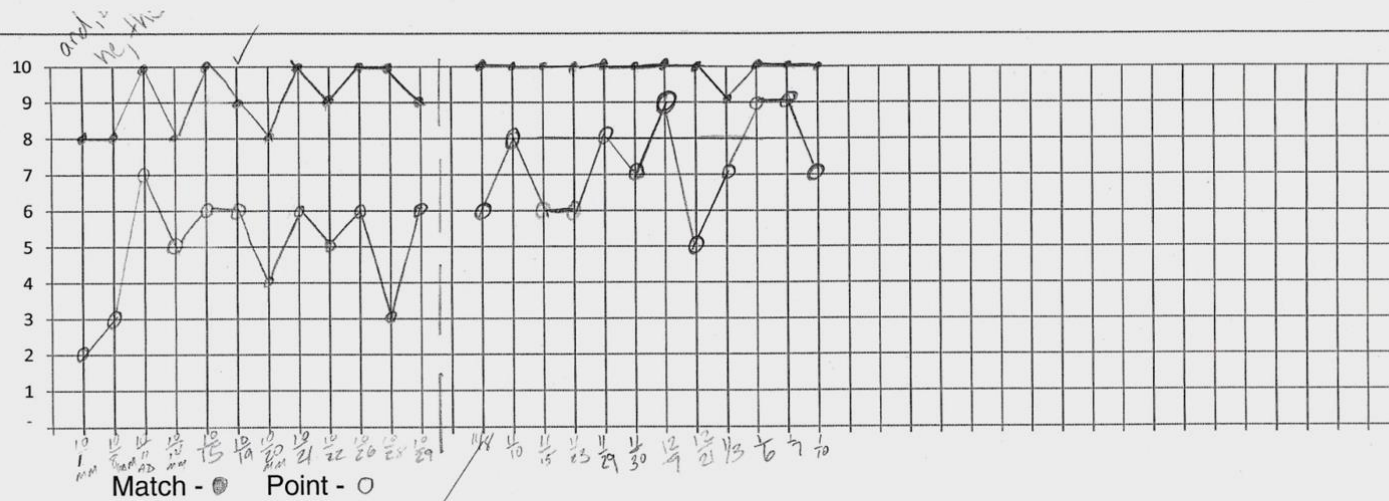




# Probe Data

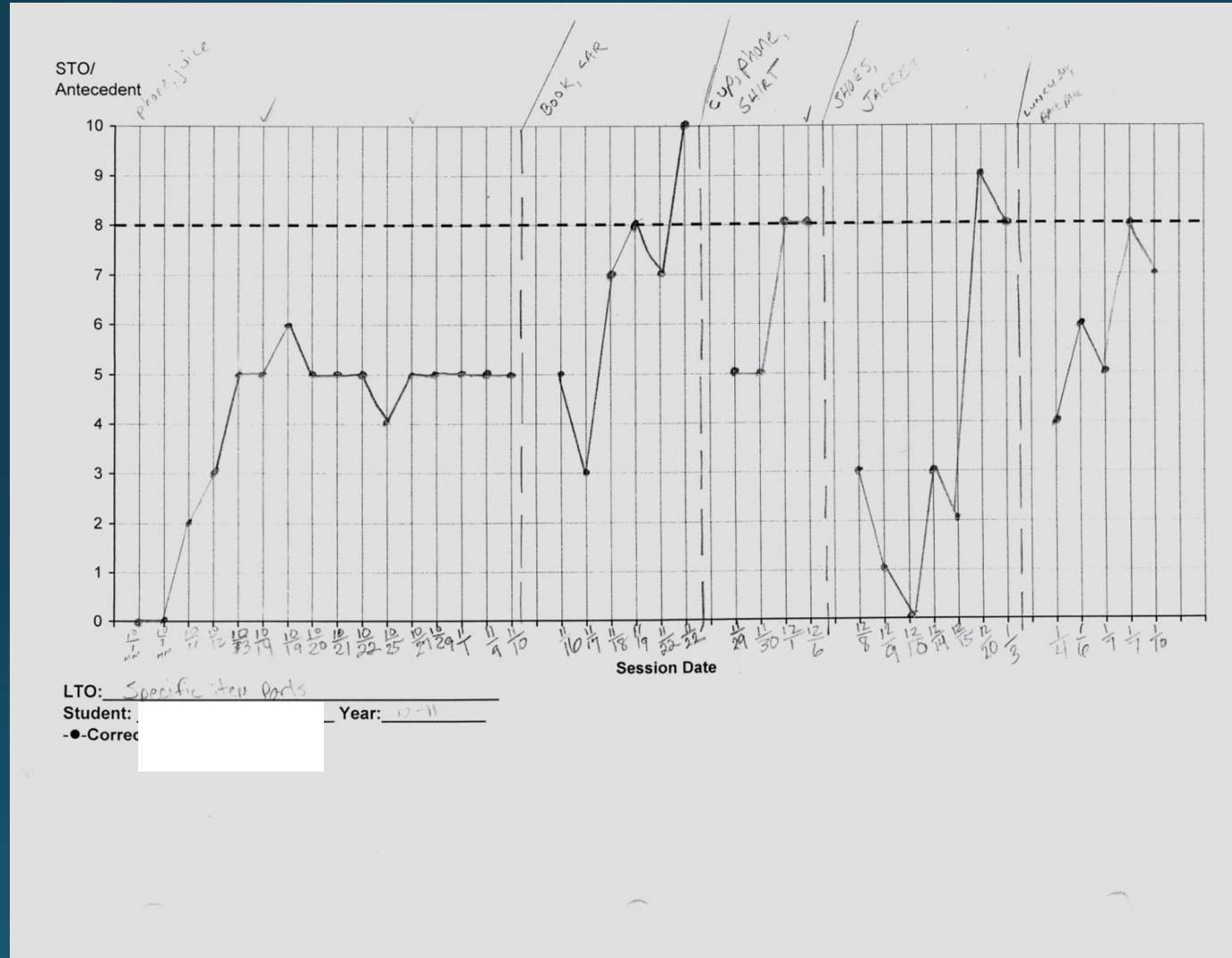


# Continuous Data

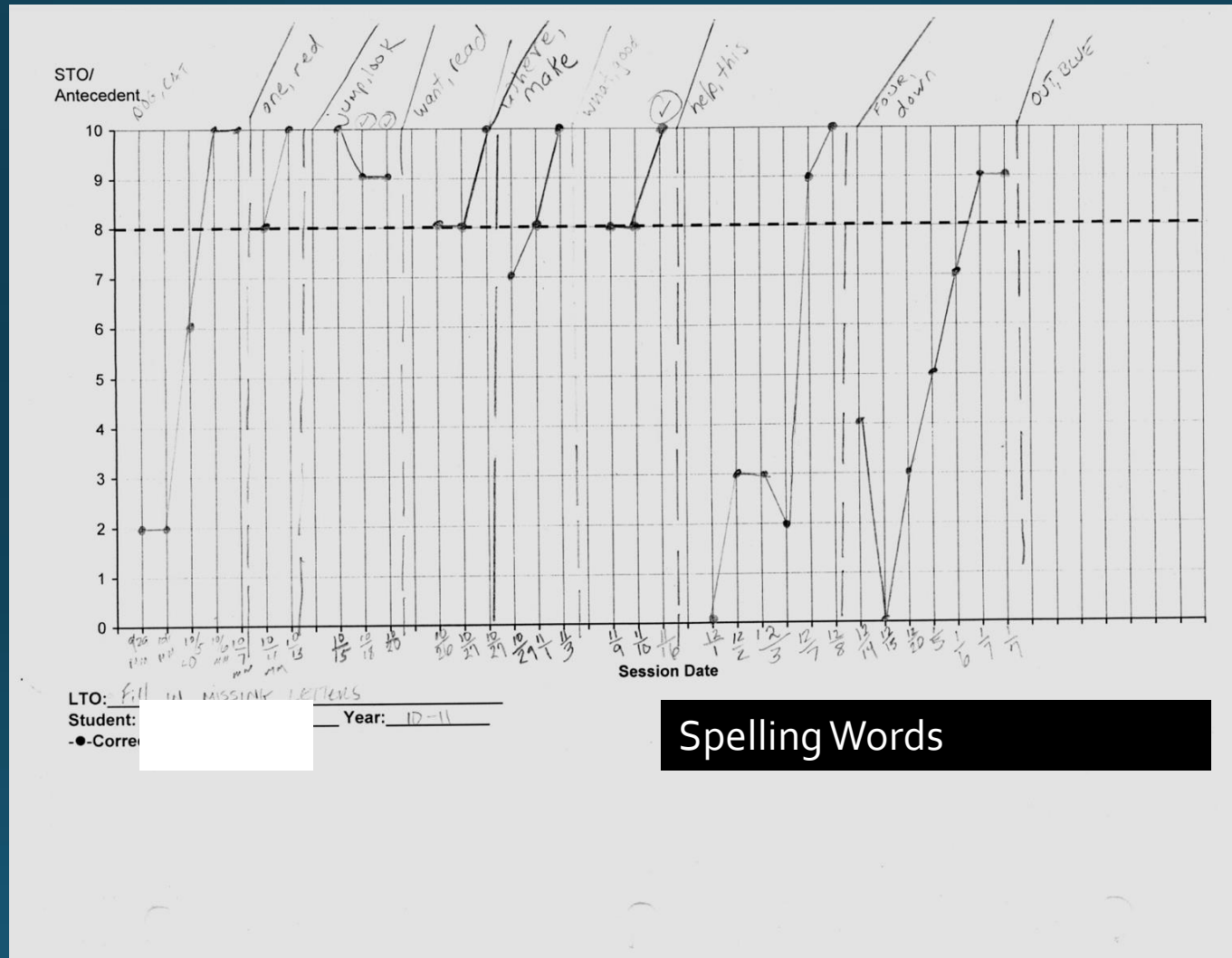


MEI

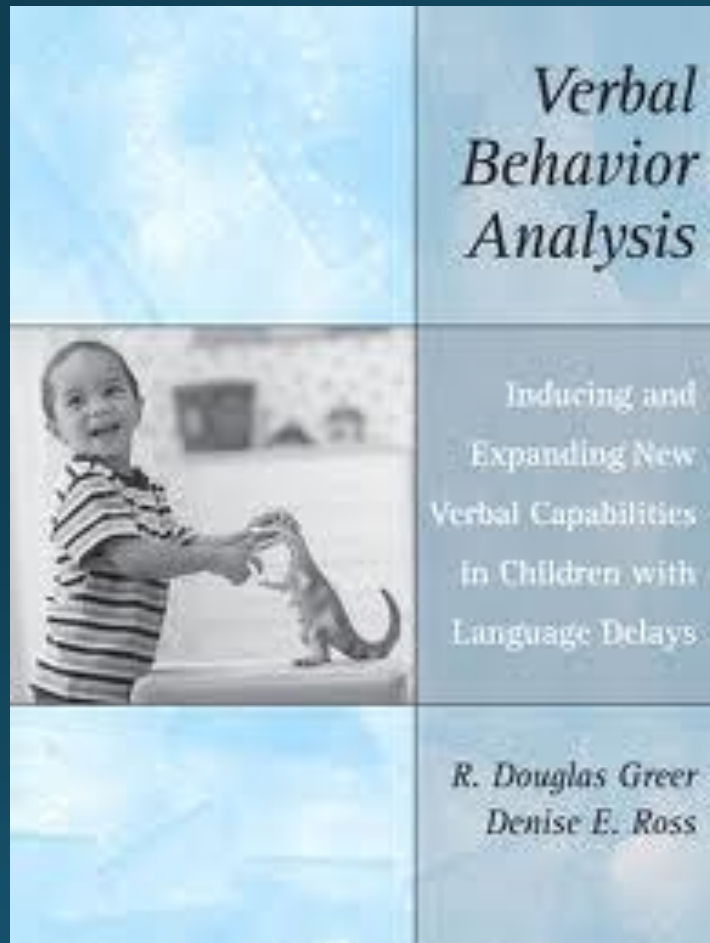
# Continuous Data



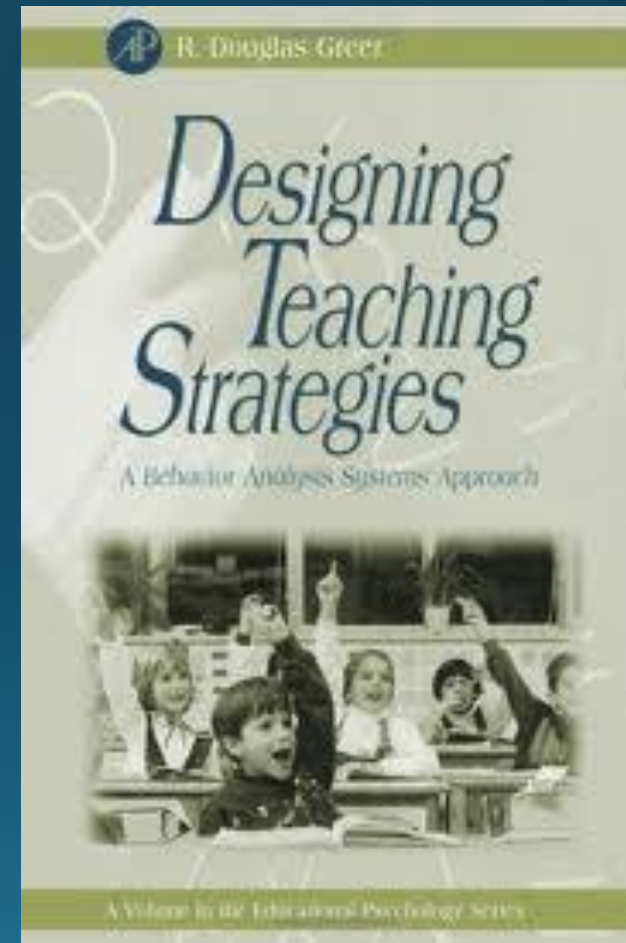
# Continuous Data



# Verbal Behavior Analysis (2007)



# Designing Teaching Strategies(2002)



# PATTAN

## PaTTAN Autism Initiative Applied Behavior Analysis Support: Introduction to Teaching Procedures

Speaking: Amiris, Mike  
8/16/2010



Go to slide 1



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DEPARTMENT OF EDUCATION

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Slide 1 of 1



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