Data Based Decision Making

- A large body of research supports the use of data based instructional practices and data based decision making.
- Within our clinical setting, data are collected daily and visually displayed on a line graph.
- The data are used to identify trends within a student's progress and in turn analyze the relationship between instruction and student performance.
- Rules for when to apply a program change are standardized and in turn supervisors can monitor progress of both the students and instructors so that students improve their performance and instructors improve their instructional decision making.

2

- A data based decision making system which includes: daily measurements of the targeted response, visual displays of the data on line graphs, evaluation of the targeted response on a daily basis and standardized rules for changing teaching practices are more effective than those programs that do not.
- Educators and practitioners who are guided by decision rules are more likely to enhance the performance of students even those with the most challenging educational needs.

3

Evaluation of the Data

- Daily cold probes, allow the instructor to evaluate and monitor a learner's progress on a frequent basis.
- All data are displayed on hand written graphs which allow instructors to closely examine the data and identify trends of a student's progress and in turn analyze the functional relationship between instruction and student performance.
- Trends in learner performance may show:
  - Acceleration of skills (increasing)
  - Deceleration of skills (decreasing)
  - Stability (no change)
  - Variability (inconsistent)
- The instructor uses the trend line to make a data based decision.

4

- However, continuous measurement of the data alone is simply not enough to ensure sound data based decision making. Standardized guidelines must be established to dictate when changes in instructional practices are necessary.

- It is only when guidelines to implement a program change are established, combined with graphic display and data evaluation, are improvements in student performance achieved.

5

Applying Decision-Making Rules

- Decision rules have been established within our clinical setting so that instructors will examine the data to identify when changes in instructional practices are necessary.

- The decision rules apply to both the instructors and the supervisors, but the decision making process first begins with the instructor.

6

Frame Analysis

- After baseline, the learner has up to 6 consecutive sessions to meet the acquisition criterion (3 consecutive days of "yes" on the cold probe). These 6 sessions, or data points, are broken up into 2 frames, each frame consisting of 3 data points. (***The frame size changes based upon the number of days required for acquisition.)
- Following baseline, an instructor must make a program change according to the following guidelines:
  - Frame 1 – If the learner receives 3 consecutive "no's," immediately make a program change. However, if the learner receives at least 1 yes, then maintain the current procedures.
  - Frame 2 – If a program change was not made in frame 1, the learner must receive 3 consecutive "yes's" across frames 1 and 2 to acquire the target. However, recording of the first "no" in frame 2 prompts an immediate program change.
  - Once an instructor change is made, the frame analysis is re-started (i.e., at frame 1).
- If a second change is needed according to this frame analysis, it is made by a lead instructor.
- If a third change is needed according to this frame analysis, it is made by a supervisor.

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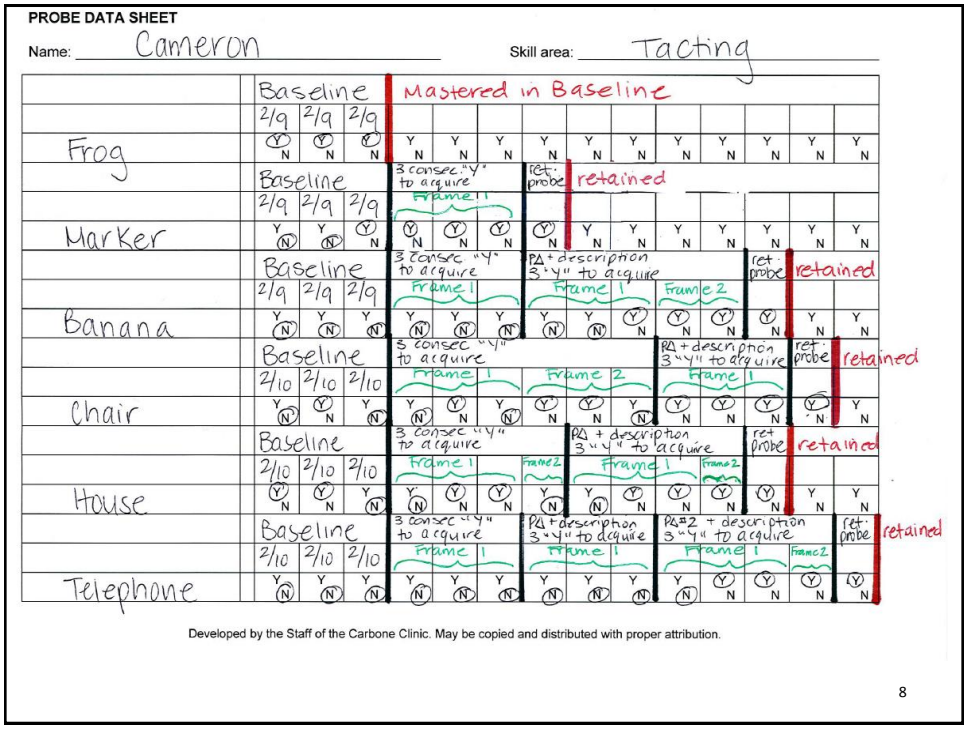

8

General Guidelines to Implement an Instructor Program Change

- The instructor fills out a program change form and writes a brief description as to why an instructional change is necessary. The best description of the reason for the program change usually includes information such as: the student does not attend to the stimulus, scan the field, or makes frequent discrimination errors.
- The instructor then chooses a change in instruction that is listed on the form or changes some element of the teaching through an analysis of the unique learning needs of the student.
- The change in the teaching (independent variable) is indicated on the graph and the probe data sheet.

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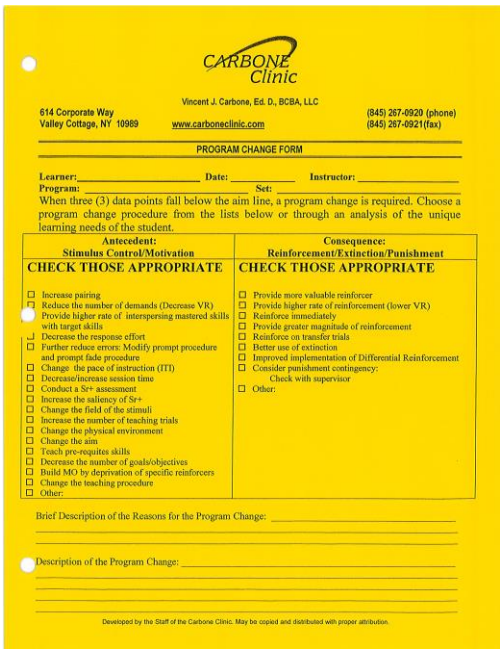

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PROGRAM CHANGE FORM

Learner:_____ Date: _____ Instructor: _____
Program: _____ Set: _____

When three (3) data points fall below the aim line, a program change is required. Choose a program change procedure from the lists below or through an analysis of the unique learning needs of the student.

Antecedent: Stimulus Control/Motivation	Consequence: Reinforcement/Extinction/Punishment
CHECK THOSE APPROPRIATE	CHECK THOSE APPROPRIATE
☐ Increase pairing ☐ Reduce the number of demands (Decrease VR) ☐ Provide higher rate of interspersing mastered skills with target skills ☐ Decrease the response effort ☐ Further reduce errors: Modify prompt procedure and prompt fade procedure ☐ Change the pace of instruction (ITI) ☐ Decrease/increase session time ☐ Conduct a Sr+ assessment ☐ Increase the saliency of Sr+ ☐ Change the field of the stimuli ☐ Increase the number of teaching trials ☐ Change the physical environment ☐ Change the aim ☐ Teach pre-requites skills ☐ Decrease the number of goals/objectives ☐ Build MO by deprivation of specific reinforcers ☐ Change the teaching procedure ☐ Other:	☐ Provide more valuable reinforcer ☐ Provide higher rate of reinforcement (lower VR) ☐ Reinforce immediately ☐ Provide greater magnitude of reinforcement ☐ Reinforce on transfer trials ☐ Better use of extinction ☐ Improved implementation of Differential Reinforcement ☐ Consider punishment contingency: Check with supervisor ☐ Other:

Brief Description of the Reasons for the Program Change: _____

Description of the Program Change: _____

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Yes/No Cold Probes

- A phase change line is drawn on the cold probe data sheet to indicate the program change.
- The criteria and the instructor change are written at the top of the probe sheet to indicate a change in the independent variable.
- If the program change is successful in increasing the accuracy of correct responses, no further changes may be needed.

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Example of an Instructor Program Change

- The following slides illustrate an instructor program change for yes/no cold probes.
- Following baseline, the learner received three consecutive "no" responses on the cold probe for the tact "grey."
- The instructor identified that the learner did not discriminate between "white" and "grey."
- The instructor made a program change to teach "grey" in discrimination with "white" and increase the number of teaching trials to four times.
- The instructor program change was successful in increasing the accuracy of the response which led to acquisition and retention of this skill.

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PROGRAM CHANGE FORM

Learner: Bobby **Date:** 5/9/11 **Instructor:** Kaitlin
Program: G4 - Tact **Set:** "Grey"

When three (3) data points fall below the aim line, a program change is required. Choose a program change procedure from the lists below or through an analysis of the unique learning needs of the student.

Antecedent: Stimulus Control/Motivation	Consequence: Reinforcement/Extinction/Punishment
CHECK THOSE APPROPRIATE	**CHECK THOSE APPROPRIATE**
☐ Increase pairing	☐ Provide more valuable reinforcer
☐ Reduce the number of demands (Decrease VR)	☐ Provide higher rate of reinforcement (lower VR)
☐ Provide higher rate of interspersing mastered skills with target skills	☐ Reinforce immediately
☐ Decrease the response effort	☐ Provide greater magnitude of reinforcement
☐ Further reduce errors: Modify prompt procedure and prompt fade procedure	☐ Reinforce on transfer trials
☐ Change the pace of instruction (ITI)	☐ Better use of extinction
☐ Decrease/increase session time	☐ Improved implementation of Differential Reinforcement
☐ Conduct a Sr+ assessment	☐ Consider punishment contingency: Check with supervisor
☐ Increase the saliency of Sr+	☐ Other:
☐ Change the field of the stimuli	
☒ Increase the number of teaching trials	
☐ Change the physical environment	
☐ Change the aim	
☐ Teach pre-requites skills	
☐ Decrease the number of goals/objectives	
☐ Build MO by deprivation of specific reinforcers	
☒ Change the teaching procedure	
☐ Other:	

Brief Description of the Reasons for the Program Change: Discrimination error - Tacts as "white"

Description of the Program Change: Teach in discrimination with white. Increase the number of teaching trials to 4 times. 3 consecutive yes to acquire.

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PROBE DATA SHEET

Name: Bobby Skill area: G4

Item														
	Baseline			3 cons. Y to acq.			PD- 4 T.T. 3 cons. Y to acq.				RP	Retained		
	4	27/11		4/28	4.29	5.2	5.3	5.4	5.5	5.6	5.13			
Swimming Pool	N	N	N	N	N	N	N	Y	Y	Y	Y	Y / N	Y / N	Y / N
	Baseline			3 cons. Y to acc.					R.P.	Retained				
	4/27/1			4/28	4.29	5.2	5.3	5.4	5/11					
Umbrella	N	N	N	N	N	Y	Y	Y	Y	Y / N	Y / N	Y / N	Y / N	Y / N
	Baseline			met in baseline										
	5/4/1													
Snake	Y	Y	Y	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
	Baseline			3 cons. Y to acq.					R.P.	Retained				
	5/4/1			5.5	5.6	5.9	5.10	5.11	5/18					
towel	N	N	N	N	N	Y	Y	Y	Y	Y / N	Y / N	Y / N	Y / N	Y / N
	Baseline			3 cons. Y to acq.			PD-Teach in discrimination w/ white 4 T.T. 3 cons. Y to acq.				RP		Retained	
	5/4/11			5.5	5.6	5.9	5.10	5.11	5.12	5.13	5.20	5.23		
grey	N	N	N	N	N	N	N	Y	Y	Y	Y W N	Y	Y / N	Y / N

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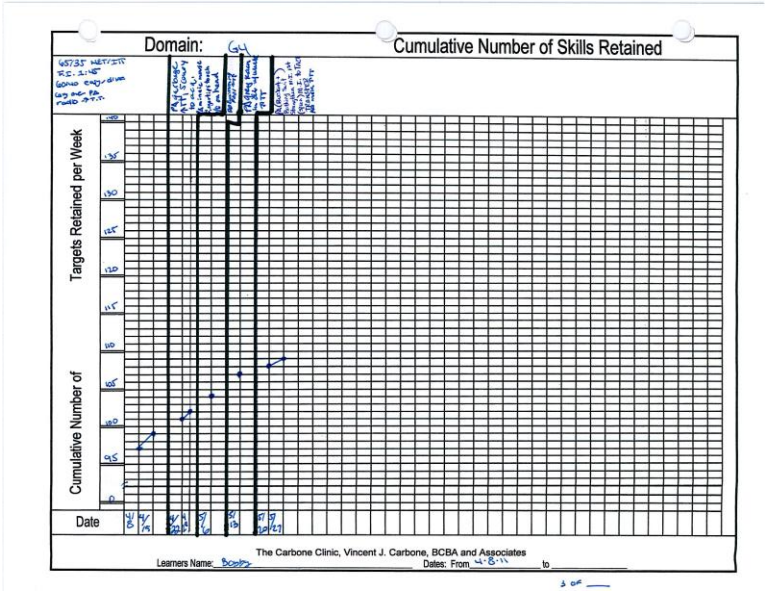

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Measurement of Instructor Performance on Data Based Decision Making

- In addition to data collected on learner performance following instructional changes, the supervisor also collects and graphically displays data regarding the effectiveness of individual instructor program changes.
- These data are used to track the performance of the instructor on their ability to make effective data based decisions per individual learner as well as their overall decisions across a variety of learners and instructional programs.

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- These data are used by the administration to evaluate how effective the instructors are at making data based decisions.
- This information can suggest something about their ability to change instructional methods based upon the data to improve learner outcomes.
- These data become important for two reasons:
  - First, it allows the supervisor to identify which instructors require training on making effective data based decisions. In other words, instructors who have a solid understanding of evidence based literature in teaching children with autism will make effective instructional decisions.
  - Second, it becomes useful in annual reviews as a way of evaluating teacher performance related to implementation of instructional practices.

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Measurement of Instructor Performance

- As an illustration of our data based decision making system, a case study of one instructor's performance on making instructional changes from January, 2010 through April, 2010 will be presented.

- Brian has Masters in Education Degree and has completed all the coursework and supervision requirements necessary for the national board certification in behavior analysis.

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- Figure 1 illustrates Brian's data on the number of instructor program changes made and the percent of instructor program changes that led to retention of skills for three learners (i.e., were successful).
- In January, 2010, Brian made 13 instructor program changes where 69% of those changes led to the Learners' retention of skills.
- In February, 2010, Brian made 4 instructor program changes of which 100% led to the Learners' retention of target skills.
- In March, 2010, he made 8 instructor program changes of which 50% led to the Learners' retention of skills.
- In April, 2010, he made 7 instructor program changes of which 43% led to the Learner's retention of skills.

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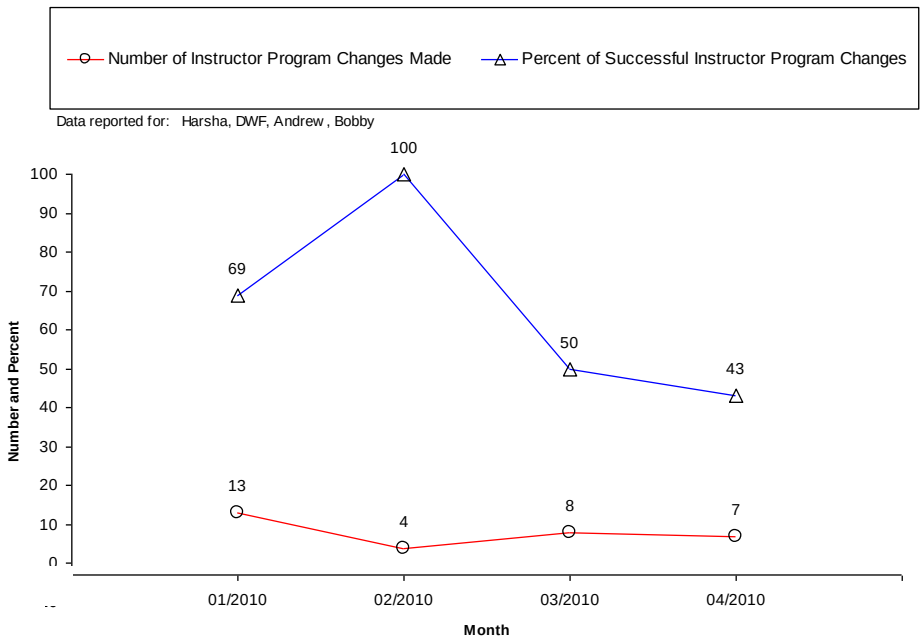

Figure 1. The number of instructor program changes made and the percentage of those program changes that were successful (i.e., led to retention of skill) per month for Brian.

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- Figure 2 illustrates the cumulative number of instructor program changes made and the percentage of those program changes that led to retention of target skills per month for all nine instructors within our center based program.
- In January, 2010, a total of 63 instructor program changes were implemented of which 54% led to retention of skills for the individual learners.
- In February, 2010, a total of 50 instructor program changes were implemented of which 50% led to retention of skills for the individual learners.
- In March, 2010, a total of 72 instructor program changes were implemented of which 42% led to retention of skills for individual learners.
- In April, 2010, a total of 85 instructor program changes were implemented of which 46% lead to the retention skills for individual learners.

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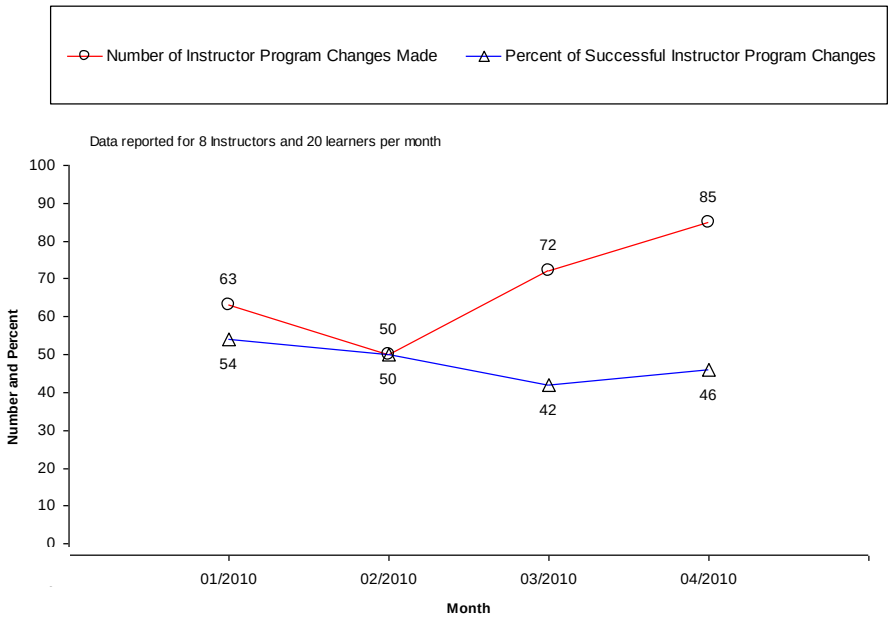

Figure 2. The number of instructor program changes made and the percentage of those program changes that were successful (i.e., led to retention of skill) per month for all instructors.

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- As shown in figures 2, the percent of successful program changes for all instructor changes decreased from January to March, and then showed a slight increase in April.
- The reduction in percentages of data based decisions from January to March suggest to the Supervisor that individual instructors may need additional supervision within instructional decisions.
- Novel or unfamiliar teaching situations, individual learner skill level, etc. can all be taken into account by the supervisor.
- Information gathered based upon the data, observation of the learner during instructional sessions and interview with the instructor will help the supervisor identify the areas in need of improvement.
- Analysis of these data help the supervisory staff directly determine the effectiveness of the instructor's data based decisions.
- Although we have collected some data in support of the effectiveness of our data based decision making system, an experimental investigation of its effectiveness on learner outcomes is still needed.

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