2019 FEB. 28-MARCH 2 NASHVILLE, TN

WIBA WOMEN IN BEHAVIOR ANALYSIS

WOMEN IN BEHAVIOR ANALYSIS

TRUMPET BEHAVIORAL HEALTH

thebaca.com/wiba-registration

#wiba2019

"To strengthen the profession of behavior analysis and create a support network for minorities within the field that extends beyond this conference."

TRUMPET BEHAVIORAL HEALTH

Recommended Practices for Data Collection for Problem Behavior

Linda A. LeBlanc
LeBlanc Behavioral Consulting

Why do practice guidelines? TRUMPET BEHAVIORAL HEALTH

- **The literature is large and complex**

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Why do we need guidelines? TRUMPET BEHAVIORAL HEALTH

- **The literature is large and complex**

- **Literature reviews and experimental analyses are often guided by a singular purpose**

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The Analysis of Verbal Behavior   2006, **22**, 35–48

Empirical Applications of Skinner's Analysis of Verbal Behavior with Humans

Rachael A. Sautter & Linda A. LeBlanc
Western Michigan University

In *Verbal Behavior*, Skinner (1957) provided a conceptual framework and taxonomy for the controlling variables of language that defined independent verbal operants by their functional relations to antecedents and consequences (rather than by topography or meaning). Although professional interest in this area has recently increased within the behavior analytic community, Skinner's conceptual framework may not yet have fully impacted the experimental literature. This quantitative review of the literature examined the studies on verbal behavior that were empirical in nature, concerned with human verbal behavior, and

Slide 1:

ELSEVIER   ScienceDirect   Behavior Therapy

Behavior Therapy 42 (2011) 135–142   www.elsevier.com/locate/bt

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Assessment and Treatment of Hoarding in an Individual With Dementia

Jonathan C. Baker
Southern Illinois University, Carbondale

Linda A. LeBlanc
Auburn University

Paige B. Raetz
Kinark Child and Family Services, Ontario

Laura C. Hilton
Western Michigan University

Slide 2:

Why do we need guidelines?

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- **The literature is large and complex**

- **Literature reviews and experimental analyses are often guided by a singular purpose**

- **Experiments often occur outside of the context of long-term therapeutic relationships**
  - Integrate into an evidence-based practice model: best experimental evidence, clinical expertise, context specific factors

Slide 3:

Practice Guidelines

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- **Synthesize the literature on a particular area of applied practice FOR practitioners**

- **Include specific clinical procedures and/or models to guide decision-making**

- **"Recommended" vs. "Best"**
  - Often no direct comparison

Slide 4:

Creating Guidelines

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- **Step 1: Review the literature to map the critical practices**

- **Step 2: Create tools and templates to facilitate accurate implementation**
  - Most important and most difficult practices

- **Step 3: Pilot the existing tools in practice and revise as needed**

Slide 5:

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Data Collection During Assessment and Treatment of Problem Behavior

Slide 6:

Creating Guidelines

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- **Step 1: Review the literature to map the critical practices**

- **Step 2: Create tools and templates to facilitate accurate implementation**
  - Most important and most difficult practices

- **Step 3: Pilot the existing tools in practice and revise as needed**

Measurement

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- **Systematic measurement is foundational to ABA services (Baer, Wolf, & Risley, 1968; Sidman, 1960)**

- **Choices about measurement and data impact other important decisions.**
  - The function of problem behavior
  - When to implement or change interventions.

- **ALL decisions guided by meaningful data**

Measurement Resources

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- **Numerous textbooks on ABA and research methods**
  - Cooper, Heron & Heward, 2007
  - Mayer, Sulzer-Azaroff, & Wallace, 2012
  - Johnston & Pennypacker, 2008
  - Kazdin, 2011

- **Each has strengths and weaknesses that make them more or less suited for specific applied circumstances**

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- **Certain important guidelines make the difference between <u>meaningful data</u> and data that you cannot use**

Recommendations

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- Select an optimal measurement system

- Collect data across multiple settings and observers

- Collect data on other behaviors besides the targeted problem behavior

- Collect data on different topographies seperately

Select an optimal measure

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- **Use continuous measurement when possible.**

- **Consider important response dimensions and temporal features of behavior (e.g., latency, duration)**

- **Consider environment resource constraints**

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Behav Analysis Practice (2016) 9:77–83
DOI 10.1007/s40617-015-0063-2

∆ABAI

TECHNICAL ARTICLE

A Proposed Model for Selecting Measurement Procedures for the Assessment and Treatment of Problem Behavior

Linda A. LeBlanc[1] · Paige B. Raetz[1] · Tyra P. Sellers[1] · James E. Carr[2]

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Abstract Practicing behavior analysts frequently assess and treat problem behavior as part of their ongoing job responsibilities. Effective measurement of problem behavior is critical

Numerous textbooks on ABA (e.g., Cooper et al. 2007; Mayer et al. 2012) and behavioral research methods (e.g. Bailey and Burch 2002; Barlow et al. 2009; Johnston

Slide 1 (TRUMPET BEHAVIORAL HEALTH)

Table 1 Features, strengths, and potential limitations of measurement procedures for problem behavior

Measurement procedure	Description	Resulting measure(s)	Strength(s)	Potential limitations
Event recording	Record each instance of behavior as it occurs	Frequency, rate, percentage of opportunities (for restricted operants)	Direct measure of the behavior	Requires constant vigilance; may be impractical for high-frequency or non-discrete behavior
Duration recording	Record the amount of time from onset to offset for each behavior as it occurs	Total duration, mean duration, percentage duration	Direct measure of the behavior (including frequency)	Requires constant vigilance; requires a timing device
Latency recording	Record the amount of time that passes between the discriminative stimulus and the onset of the behavior	Mean latency	Direct measure of the temporal relation between the discriminative stimulus and the behavior	Requires constant vigilance; requires a timing device
Intensity recording	Record a dimension of intensity (e.g., force, volume) for each instance of the behavior	Various (e.g., mean decibel, mean rating per event)	Direct measure of the behavior; automated recording possible with some dimensions (e.g., volume)	Requires a reliable and valid measurement device (e.g., decibel meter) or rating system; requires constant vigilance
Permanent-product recording	Document the effect of a behavior on the environment	Various (e.g., wound size, number of holes in wall)	Allows measurement of behavior that occurs at inaccessible times	An indirect assessment of behavior; behavior must reliably produce the product and be the only source of the product
Partial-interval recording	Record whether a behavior occurred at all during specific time intervals for defined observation period(s)	Percentage of intervals in which the behavior occurred	Does not require constant vigilance	Generates an estimate of behavior; systematically overestimates the occurrence of behavior; requires a timing device
Momentary time sampling	Record whether a behavior occurred at a given moment for defined observation period(s)	Percentage of samples or intervals in which the behavior occurred	Allows consistent measurement of multiple individuals or behaviors; does not require constant vigilance; good correspondence to event recording compared to other discontinuous procedures	Generates an estimate of behavior. Inappropriate for short-duration or low-frequency behavior; requires a timing device.

Slide 2

Event Recording

- **Frequency of each behavior is recorded during an observation**

- **Count or rate (count/time)**

- **Best for behaviors with clear beginnings and endings and reasonably similar durations**

- **Labor intensive**

Slide 3

Duration

- **Amount of team each behavior occurs during an observation**

- **Mean duration, total duration, or % duration**

- **Excellent when the duration is a critical dimension of interest, can also generate a frequency measure if each event is separate**

- **Labor intensive**

Slide 4

Discontinuous Measures

- **Estimate of behavior – Sampling error!!**
- **Partial interval – occurrence in each consecutive brief interval**
  - Good for high rate behavior but over-estimates behavior; optimal interval is 5-10s
  - Labor intensive
- **Momentary Time Sampling – occurrence at the end of each specific sampling interval**
  - Good for multiple behaviors or people, error is unsystematic, small interval is best
  - NOT labor intensive!

Slide 5
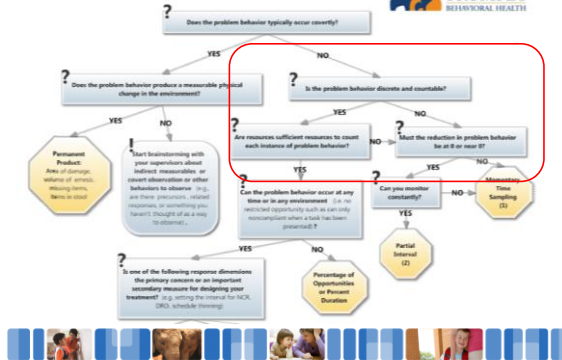
Decision Making Model

- **Series of questions that you can ask and answer to select the optimal measurement procedure based on**
  - Specific characteristics of behavior
  - Personnel resources and constraints
  - Important dimensions of behavior
  - Nature of the behavior: free/restricted operant
- **Each answer leads you to a next question OR an optimal measure for your circumstances**
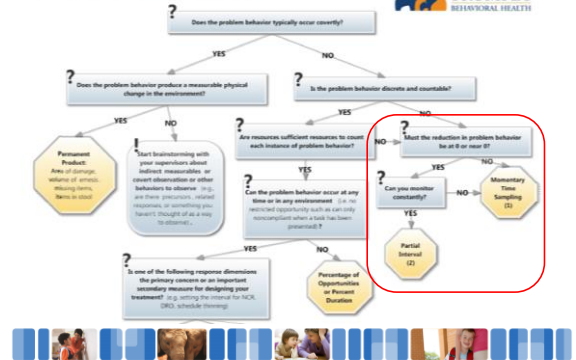

Slide 6

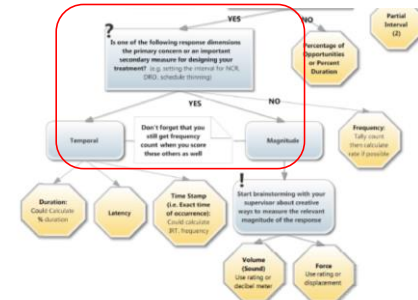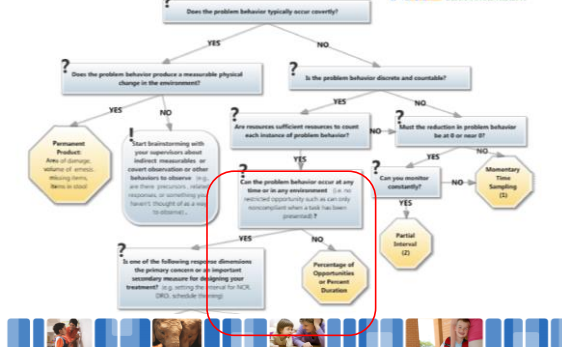
Selection Model for Measures of Problem Behavior

Case Example #1

- **Joey is a 7-year-old student in a classroom with 22 other students.**

- **Target behaviors: off-task, disruptions, rude statements**

- **Rude statements**
  - Event recording
- **Off task and disruptions**
 - Permanent product and MTS

Case Example #2

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- Jessica is a 3-year old child who engages in tantrums that can last up to 30 minutes

- During the tantrums, she may scream, cry engage in SIB, agrees towards others, break objects in her environment, drop to the floor and kick among other behaviors

- Her team knows that they are likely to implement some type of reinforcement based program that will require setting an initial time schedule

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Selection Model for Measures of Problem Behavior

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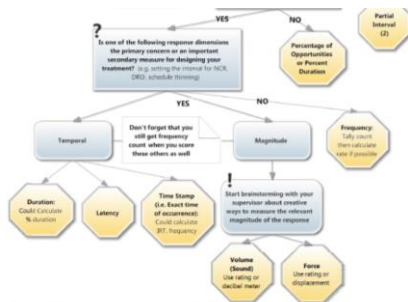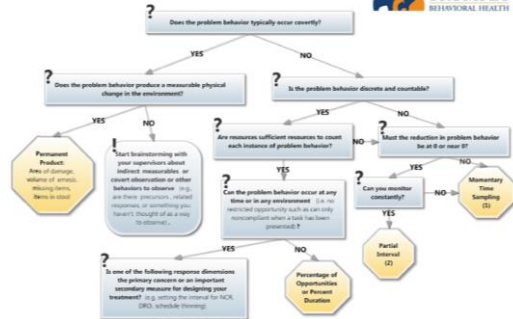
(1) Fiske & Delmolino: Cautionary Notes for Momentary Time Sampling
Small changes and very low level behavior may not be detected initially
Behavior may not be captured once reduced to low levels
(2) Fiske & Delmolino: Cautionary Notes for Partial Interval
Treatment effects may be masked if not robust

Size Does Matter!

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- For discontinuous measurement, the size of the interval matters a lot in accuracy of your data!

- Smaller intervals (i.e., 5-10 s) produce less error and are often used in published research

- Increased effort of using a small interval may lead to practitioners using intervals that are too large in everyday practice

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Research to Practice Gap

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- Do practitioners actually use the intervals that have been studied in experiments?

- Do practitioners use MTS more often than interval recording?

- Does a LARGE data set of actual client data reveal the same patterns of error in data sampling as the previous small scale studies?
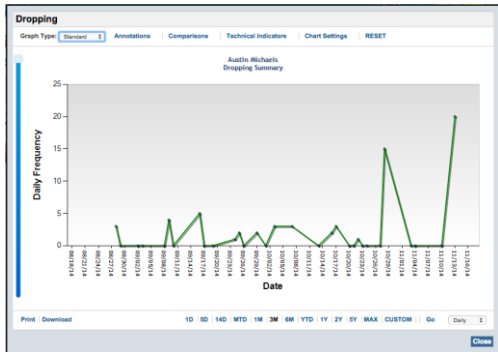

Catalyst

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- Electronic data collection and management software designed for use by ABA Human Service providers
- Data collection for skill acquisition and problem behavior
- Specification of programs (e.g., tact, receptive ID), procedures (e.g., prompting, BIP) and mastery criteria
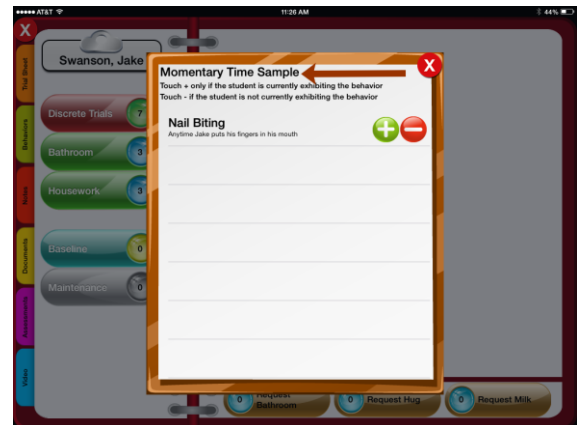- Automatically generates graphs

Tablet Application – Task Analysis
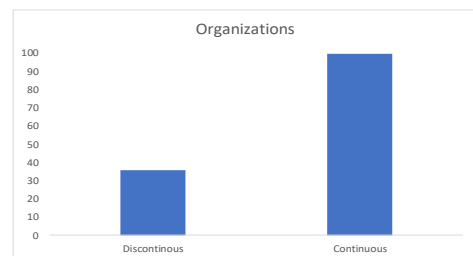

User Description

- **Agencies: 708**
  - Excluded agencies who declined participation for data analysis

- **Clients: ~26,000**
  - 90% autism
  - Vast majority male ages 2-12

- **Clients in Agency:** Mean = 38; Range 1 – 2305

Data Collection

How big can the interval be?

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- **5-s or 10-s intervals provide reasonable estimates of behavior (Harrop & Daniels, 1986).**
- **Hanley et al (2007) - little difference in error for intervals between 5-120 s (i.e., 2 mins).**
- **Guntner et al (2003) - 2-min MTS produced a reasonable estimate but not 4-min and 6-min**

Data Inclusion and Procedures

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- **All clients with a MTS or IR measure for problem behavior were identified.**
- **Those with multiple sessions (i.e., 50 or more) with problem behavior data were included.**
- **The value of the interval was captured for each client and imported into an Excel spreadsheet.**

Data Inclusion and Procedures

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- **Interval values were sorted from shortest to longest**
- **Total patients with a specific value divided by the total patients**
- **Separate calculations for MTS and IR**

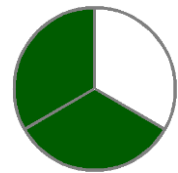| Interval	Interval Recording Number of Patients (% of 1926)	Momentary Time Sample Number of Patients (% of 1393)
10-s	69 (4%)	32 (2%)
15-s	26 (1.3%)	13 (.9%)
20-s	24(1.2%)	9 (.6%)
30-s	84 (4%)	131 (9%)
60-s (1 min)	**222(11.5%)**	**172 (12%)**
120-s (2 min)	**230 (12%)**	**490 (35%)****
180-s (3 min)	41 (2%)	73 (5%)
300-s (5 min)	**928 (48%)****	**246 (18%)**
600-s (10 min)	91 (5%)	94 (6%)
900-s (15 min)	105 (5%)	41 (2%)
1800-s (30 min)	14(.7%)	19 (1.4%)

Results Summary: IR

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- **The default interval in the drop-down menu was most used (i.e., 5 min; 48%) - steep drop off to the 2nd most common interval of 2 minutes (12%).**
- **36% had an interval value at or below the longest interval producing reasonable estimates in the literature (i.e., 2 minutes)**

Results Summary: MTS

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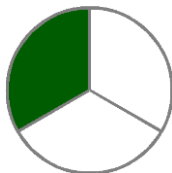
- **The most commonly used interval was the default in the drop-down menu (i.e., 2 min; 35%) - 2nd most common interval was 5 minutes (18%).**
- **62% had an interval value at or below the longest interval producing reasonable estimates in the literature (i.e., 2 minutes)**

Does the Default Setting Matter?   TRUMPET BEHAVIORAL HEALTH

- **Reset IR default from 5 min to 2 min**
- **Left MTS default at 2 min.**

Values	Original IR	Current IR	Original MTS	Current MTS
30-s	4%		9%	
60-s (1 min)	11.5%		12%	
120-s (2 min)	12%		**35%**	
180-s (3 min)	2%		5%	
300-s (5 min)	**48%**		18%	

Does the Default Setting Matter?   TRUMPET BEHAVIORAL HEALTH

- **Reset IR default from 5 min to 2 min**
- **Left MTS default at 2 min.**

Values	Original IR	Current IR	Original MTS	Current MTS
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120-s (2 min)	12%		**35%**	
180-s (3 min)	2%		5%	
300-s (5 min)	**48%**		18%	

Does the Default Setting Matter?   TRUMPET BEHAVIORAL HEALTH

- **Reset IR default from 5 min to 2 min**
- **Left MTS default at 2 min.**

Values	Original IR	Current IR	Original MTS	Current MTS
30-s	4%	0%	9%	1%
60-s (1 min)	11.5%	4%	12%	17%
120-s (2 min)	12%	**72%**	**35%**	**52%**
180-s (3 min)	2%	0%	5%	4%
300-s (5 min)	**48%**	11%	18%	9%

Analysis of Continuous Sessions   TRUMPET BEHAVIORAL HEALTH

- **Data on a relatively common problem behavior (e.g., aggression, self-injury, stereotypy, tantrums)**

- **Session >1 hour (allow scoring opportunities for longer intervals)**

- **Session had to contain data on problem behavior**

## Resulting Sessions   TRUMPET BEHAVIORAL HEALTH

- **N = 878 sessions (1-11 hours)**

- **Over 90% less 4 hours in duration**
  - 1-1.99 hours (n=176)
  - 2-2.99 hours (n=394)
  - 3-3.99 hours (n=236)

- **Topography: (62%) were tantrums (n=361 sessions) and noncompliance (n=186 sessions)**

Metrics   TRUMPET BEHAVIORAL HEALTH

- **Correlation Coefficient - % duration of problem behavior with % of intervals/samples**
  - Indicates whether the values co-vary (i.e., as one goes up or down, does the other do the same or opposite)

- **Difference Score = /% duration - % intervals|samples/**
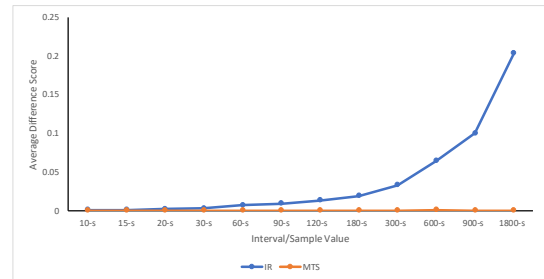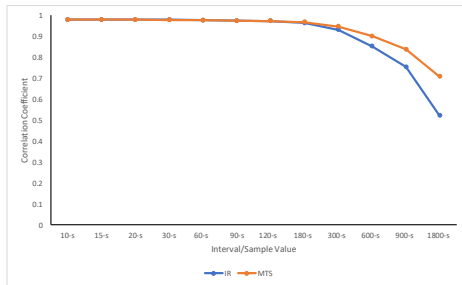
Results Summary

- **The default setting influenced interval selection!!**

- **The majority of intervals were longer than recommended which may mean high error!**

- **MTS was always better than IR**

- **Don't go higher than 2-3 min!**

Recommendations

- Select an optimal measurement system
- Collect data across multiple settings and observers
- Collect data on other behaviors besides the targeted problem behavior
- Collect data on different topographies seperately

- **Collect data across all environments in which you hope/fear to see the behavior occur**

- **Use the same data collection system across all environments and phases of intervention so that you can evaluate your effects**

- **Train all data collectors to a success criterion in using your data collection system**
  - Instructions, modeling, rehearsal, feedback
  - 90-100% accuracy

- **Transfer data collection to people in the natural environment (e.g., parents, siblings, teachers) when feasible**

Recommendations

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- Select an optimal measurement system
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- Collect data on other behaviors besides the targeted problem behavior
- Collect data on different topographies seperately

Other behaviors

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- **Collect data on**
  - Appropriate behaviors
  - Precursor behaviors
  - Collateral behaviors
  - Others' behaviors

Alternative Behaviors

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- Consider behaviors that already exist in the individual's repertoire

- Consider behaviors that are functionally equivalent to the behavior targeted for reduction

- Consider behaviors that are easy to emit and likely to access reinforcement quickly

Behavioral Example

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- **Behavior Targeted for Reduction:** Aggression

- **Function of Targeted Behavior:** Access to preferred items/activities (tangible)

- **Potential Alternative Behavior:** Vocal requests for the item/activity; babbling

Behavioral Example

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- **Behavior Targeted for Reduction:** High rate social approach responses

- **Function of Targeted Behavior:** Access to attention

- **Alternative Behavior:** Social approach responses when availability is signaled

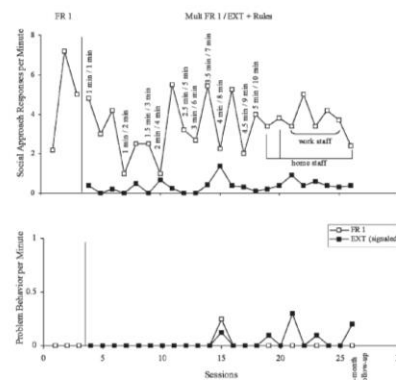- **Other Behavior to Watch:** Hitting, kicking, throwing objects

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Grow, LeBlanc & Carr (2010) JABA

Figure 1. Social-approach responses (top) and problem behavior (bottom) per minute during unsignaled FR 1 (open squares) and signaled extinction (filled squares) conditions.

Precursor Behaviors

- Collect data on behaviors that occur prior to the problematic behavior targeted for reduction (response hierarchy)

- Collect data on any potentially adaptive behavior(s) that may occur prior to targeted problem behavior

Behavioral Example

- **Behavior Targeted for Reduction:** Aggression

- **Function of Targeted Behavior:** Access to preferred
- items/activities (tangible)

- **Potential Alternative Behavior:** Vocal requests for the
- item/activity

- **Precursor Behavior:** Reaching for the item

Collateral Behaviors

- Collect data on other non-targeted problem behaviors

- Consider relevance of other innocuous behaviors that could potentially become problematic if they increase in intensity or frequency

Behavioral Example

- **Behavior Targeted for Reduction:** Aggression

- **Function of Targeted Behavior:** Access to preferred items/activities (tangible)

- **Potential Alternative Behavior:** Vocal requests for the item/activity

- **Precursor Behavior:** Reaching for the item

- **Collateral Behaviors:** Crying

Environmental Events

- **Measure aspects of the environment that might change during treatment (S^D, MO, reinforcement)**

- **Collect data on antecedents to problem behavior**

- **Collect data on reinforcement rate/frequency**

Behavioral Example

- **Escape-maintained problem behavior**
  - Collect data on:
    - Rate of demand presentation
    - Type of demands (i.e., academic, self- help skills, easy, difficult, etc.)
- **Tangible-maintained problem behavior**
  - Collect data on:
    - Frequency of item/ activity removal and/or denial
    - Type of items/ activities that are removed/ denied

Procedural Integrity

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- **Reinforcement frequency**
  - Collect treatment integrity data:
    - Errors of omission
    - Errors of commission
  - Collect data on reinforcement for both problem and appropriate alternative behaviors to determine/monitor pre- and post-treatment reinforcement rates

Behavioral Example

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- **Behavior targeted for reduction:** Aggression

- **Behavior targeted for increase:** Saying "cookie please"

- **Error of omission:** Cookie not delivered following
- "cookie please"

- **Error of commission:** Cookie presented when "cookie
- please" not said
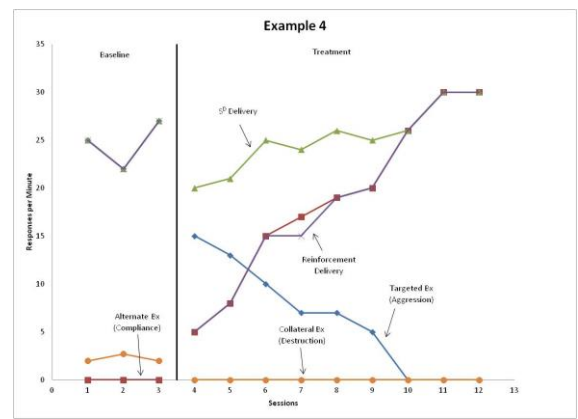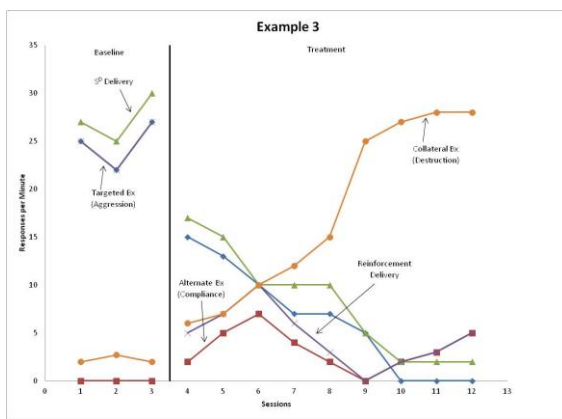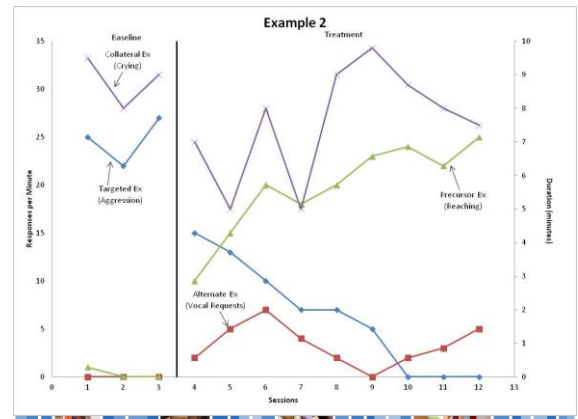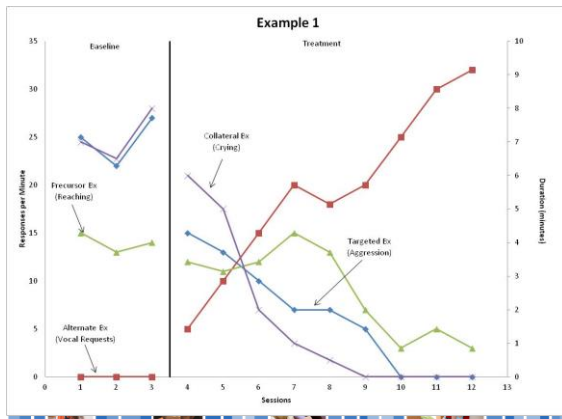
Example 1

Example 2

Example 3

Example 4

Recommendations

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- Select an optimal measurement system
- Collect data across multiple settings and observers
- Collect data on other behaviors besides the targeted problem behavior
- Collect data on different topographies separately

Separate Topographies

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- **Different topographies might have different optimal measures**

- **Multiple topographies might be maintained by the same or different functions (e.g., attention, escape from demand, automatic reinforcement, etc.)**
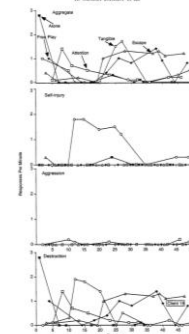
- Derby et al. (2000)

Separate Topographies

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- **Graph each topography separately**
  - Illustrates different functions more clearly during assessment
  - Allows to detect if different topographies respond to different treatments

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- **All Topographies**

Recommendations

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- Select an optimal measurement system
- Collect data across multiple settings and observers
- Collect data on other behaviors besides the targeted problem behavior
- Collect data on different topographies seperately

Opportunity and need

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- **Rapid expansion of ABA services for individuals with autism and other disabilities**

- **Majority of the workforce has less than 5 years of experience designing programming**

- **Guidelines allow rule-governed behavior instead of all direct contingency shaping**

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