Producin Meaningful Improvements in Problem Behavior of Persons with Autism

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For more information go to:
www.practicalfunctionalassessment.com

The aim of the treatment is to restore balance in the relationships between persons with autism and their family members and teachers and without regrettable actions by either

With Autism, there is a higher likelihood of problem behavior like meltdowns, aggression, and self-injury

Why do restricted “lifestyles” dictated by problem behavior persist for many families with children on the spectrum?
Restrictive lifestyles persist partly because problem behavior of children is merely modified, medicated, mollified, micro-analyzed, remedied apart from skill development.

Why does problem behavior occur?

Causes are complex—first consider all of them.

Then consider the causes that you can do something about.

– For me, those are the consequences of the behavior that serve as reinforcement.
Powerful working assumption

If problem behavior is occurring with regularity.....

– it is being reinforced

Antecedent  ➔  Behavior  ➔  Consequence

<table>
<thead>
<tr>
<th>Establishing operation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Behavior</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consequence</td>
</tr>
<tr>
<td>Mom attends to Sibling</td>
<td>Throwing toys</td>
<td>Mom's attention</td>
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<tr>
<td>Dad instructs to turn off Ipad</td>
<td>SIB</td>
<td>Dad gives a little more time on Ipad</td>
</tr>
<tr>
<td>Teacher instructs to come off swing to do some discrete-trial work</td>
<td>Meltdown</td>
<td>Teacher tries to calm child with reminders of good events &amp; starts to comply with child requests ....</td>
</tr>
</tbody>
</table>

The one thing at a time model:

An Antecedent  ➔  A Behavior  ➔  A Consequence

An Establishing operation  ➔  A Problem Behavior  ➔  A reinforcer

The shift to the many things at a time model:

Antecedents  ➔  Behaviors  ➔  Consequences

Establishing operations  ➔  Problem Behaviors  ➔  Reinforcers
Functional assessment

it is a process
Goal of a Functional Assessment

Identify the consequences that maintain problem behavior

Identify the situations that evoke the behavior

(And, to do so quickly and safely)

In order to treat problem behavior

Practical Functional Assessment Process

Indirect Assessment
*Open-ended interview (always)

Functional Analysis
*IISCA (always)

Discovery

Demonstration

Case Example: Gail, 3 years old, PDD-NOS

*Interview suggested that Gail engaged in meltdowns and aggression...

when Mom was attending to other tasks or people...

in order to gain Mom's undivided attention and to have
Mom play with her and her most preferred toys.
Functional Analysis: Test Condition

Test: Mom attends to other tasks and people...

As soon as Gail engaged in any problem behavior, Mom directs all of her attention to Gail while interacting with her and her most preferred toys.

In the test, we are emulating the conditions Mom described as being associated with Gail’s problem behavior.

Functional Analysis: Control Condition

Control: Mom directs all her attention to Gail while interacting with her and her most preferred toys the entire time.

In the control, we are emulating the conditions Mom described as being associated with no problem behavior.

Case Example: Gail, 3 years old, PDD-NOS

By alternating between 5 minute periods of test and control conditions, we were able to turn on and off Gail’s problem behavior...

Giving us and her Mom confidence as to why she was engaging in the extraordinary problem behavior...

...to simply gain and maintain her Mom’s undivided attention and play time
Three important outcomes from the analysis

1. We have confirmed the hunch
2. We have a baseline from which to evaluate treatment
3. We have a motivating condition to teach Gail skills (and she has learned "the game")

IISCA: Interview-Informed Synthesized Contingency Analysis

1. Single
2. Individualized
3. Synthesized contingency
4. Reinforce precursors to and dangerous behavior
5. Test-matched
6. Rapid alternation of test and control conditions

An IISCA

Zeke
14-year old boy
Diagnosed with Autism
Engaged in Severe SIB and Aggression
1:1 in Specialized School
Ensuring a Safe Analysis

Most important....

Immediate delivery
of all suspected reinforcers
for all forms of problem behavior reported to co-
occur

The process of
interview then analysis*
has generality

and by analysis,
I mean those that
involve synthesized contingencies
informed from open-ended interviews
a.k.a IISCASS

From Jessel, Hanley, and Ghaemmaghami (JABA, 2016)
Some Important Aspects of our Approach

We synthesize multiple contingencies into one test condition
which contingencies and the specific materials and interactions are informed by the interview

**PAST:** Single contingencies
- **Attention** or tangibles (social-positive reinforcement)
- or **Escape** (social-negative reinforcement)
- or **Sensory/non-social** (automatic reinforcement)

**PRESENT:** Synthesized (combined) contingencies
- **Attention and tangibles**
- **Escape to tangibles**
- **Escape to tangibles and attention**
- **Escape to automatic reinforcement**
- **Compliance with mands**
- **Escape to compliance with mands**
- **Escape to access to tangibles, rituals, & preferred conversations**
- **Etc....**
Why synthesize? Isolated contingencies sometimes do not control behavior whereas synthesized contingencies do.

Analysis Comparison  
(Slaton et al., 2017, JABA)

Sometimes both synthesized and isolated reinforcement contingencies influence problem behavior.

Analysis Comparison  
(Slaton et al., 2017, JABA)

But our analyses show, more often, that synthesized reinforcement contingencies influence problem behavior whereas isolated ones do not.
Why synthesize? Isolated contingencies sometimes do not control behavior whereas synthesized contingencies do.

From: Nature and Scope of Synthesis in Functional Analysis and Treatment of Problem Behavior
Slaton & Hanley (under review, JABA)
## Treatment efficacy often depends on synthesized contingencies

<table>
<thead>
<tr>
<th>First Author (Year)</th>
<th>Standard FA Elements</th>
<th>Effective isolated analyses</th>
<th>Effective synthesized analyses</th>
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<tr>
<td>Lalli (1994)</td>
<td>Escape, attention</td>
<td>Escape</td>
<td>Escape to attention</td>
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<td>Andy: Esc to long</td>
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<td>Sean: Escape</td>
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<td>Escape</td>
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<td></td>
<td>Escape to attention</td>
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<td>Ben: Esc to long</td>
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<td>tangibles</td>
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<td>Jerry: Esc to att.</td>
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<tr>
<td></td>
<td>tangibles</td>
<td></td>
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<tr>
<td>Zangrillo (2016)</td>
<td>Escape</td>
<td></td>
<td>Escape to tangibles</td>
</tr>
</tbody>
</table>

## Synthesized vs Isolated Analyses

(Slaton et al., 2017, *JABA*)

### Why synthesize?

1. Seems to emulate the ecology better
2. Isolated contingencies sometimes do not control behavior whereas synthesized contingencies do
3. Doing so leads to effective action—meaningful treatment effects
   - Hanley et al., 2014; Santiago et al., 2016; Ghaemmaghami et al., 2016
Dr. Joshua Jessel & colleagues (in press, JABA)

Achieving Socially Significant Reductions in Problem Behavior following the Interview-Informed Synthesized Contingency Analysis: A Summary of 25 Outpatient Applications

For more support to engage this process go to: www.practicalfunctionalassessment.com
Functional Analysis
Zeke
14-year old boy
diagnosed with Autism
Engaged in Severe SIB and Aggression
1:1 in Specialized School

Problem behavior per min

<table>
<thead>
<tr>
<th>Sessions</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
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</tr>
</tbody>
</table>

A simple response (button press: “My way please”) is prompted and reinforced with (escape to child-directed play & teacher attention).

Problem behavior no longer yields the reinforcers (escape to child-directed play and teacher attention).
Zeke
14-year old boy
diagnosed with Autism
Engaged in Severe SIB and Aggression
1:1 in Specialized School

Now, FCRs are reinforced 1/3 of the time. TRs are reinforced 1/3 of the time. Noncompliance with progressively longer and more challenging instructions is reinforced.

Now, FCRs are reinforced half the time. The other half, the teacher denies the bid (e.g., say’s no, do your work without me, please)

Responses to disappointment are prompted and reinforced.

(Take a breath and nodding you)

Cases of disappointment, delays to reinforcement, and unpredictable outcomes have now been introduced!

A more interactional response (shoulder tap, wait for teacher acknowledgment, two-button press)

May I have / My way please?

in prompted and reinforced

Responses to disappointment are prompted and reinforced.

(Take a breath and nodding you)
What is the treatment????

Intermittent and unpredictable reinforcement of life skills:

Functional Communication
Delay/denial toleration
Compliance
Treatment Implementation

1. Put these in your pocket
2. Pull one out while child is experiencing their reinforcers
3. Keep it to yourself
4. Require that behavior next time

*Materials not needed:
- Laminating machine
- Glue guns
- Markers
- Velcro
- Tokens
- Token boards
- Timers
- Stickers
- Candies
- Anything that was not already in the child’s environment!

App called “Names in a Hat”

App called “Roundom”
Treatment Analysis
Gail
3-year old girl diagnosed with Autism
Engaged in extended meltdowns with aggression
Process in Clinic and home with mother implementing

Time Assessment

<table>
<thead>
<tr>
<th>Step</th>
<th>% of Visits (Minutes)</th>
<th>Cost (in US dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1* Interview</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>2* Functional Analysis</td>
<td>1 - 4</td>
<td>300 - 890</td>
</tr>
<tr>
<td>3* Functional Communication Training</td>
<td>1 - 4</td>
<td>300 - 540</td>
</tr>
<tr>
<td>4 Complex FCT</td>
<td>1 - 4</td>
<td>400 - 940</td>
</tr>
<tr>
<td>5 Functional Communication Training</td>
<td>1 - 4</td>
<td>300 - 540</td>
</tr>
<tr>
<td>6 Tolerance Response Training</td>
<td>2 - 7</td>
<td>300 - 1400</td>
</tr>
<tr>
<td>7 Easy Response Chaining</td>
<td>1 - 5</td>
<td>300 - 600</td>
</tr>
<tr>
<td>8 Difficult Response Chaining</td>
<td>3 - 5</td>
<td>400 - 2240</td>
</tr>
<tr>
<td>9 Treatment Extension</td>
<td>2 - 7</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>1400</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5,467</td>
</tr>
</tbody>
</table>

Supervision meetings: 20 - 28
Report writing / planning: 4

Grand Total: 6,232 - 8,650

Gail 3-year old girl diagnosed with Autism
Engaged in extended meltdowns with aggression
Process in Clinic and home with mother implementing

Reinforcement: Time with mom's undivided attention and preferred toys

Compliance: Doing whatever mom asks and trying to do quietly and completely

"Play with me" saying "Excuse me," waits for acknowledgement from parent, then says, "Will you play with me, please" with appropriate tone and volume

Saying, "okay" while glancing at parent who just said "No," "Wait," "Hold on," or "in a minute"
### Cost Assessment

<table>
<thead>
<tr>
<th>Steps</th>
<th># of Visits</th>
<th>Cost Range</th>
<th>Mean</th>
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<tbody>
<tr>
<td>1st Interview</td>
<td>1</td>
<td>200 - 500</td>
<td>200</td>
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<tr>
<td>2nd Functional Analysis</td>
<td>1 - 5</td>
<td>100 - 500</td>
<td>200</td>
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<tr>
<td>Phase 1 Communication Training</td>
<td>1 - 5</td>
<td>100 - 500</td>
<td>200</td>
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<tr>
<td>4th Complex VCF</td>
<td>1 - 6</td>
<td>200 - 800</td>
<td>467</td>
</tr>
<tr>
<td>6th Treatment Extension</td>
<td>2 - 11</td>
<td>200 - 1400</td>
<td>913</td>
</tr>
<tr>
<td>7th IISCAs</td>
<td>1 - 3</td>
<td>200 - 534</td>
<td>400</td>
</tr>
<tr>
<td>8th Treatment Extension</td>
<td>4 - 16</td>
<td>200 - 860</td>
<td>487</td>
</tr>
</tbody>
</table>

**Totals:** 23 - 32  
Mean: 27  
Cost: 5,467

**Supervision meetings:** 16 - 28  
Mean: 20  
Cost: 1,000 - 1,750  
Mean: 1,250

**Report writing / planning:** --  
Mean: 500

**Grand Totals:** 6,225 - 8,650  
Mean: 7,217

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### Social Acceptability Questionnaire Results

<table>
<thead>
<tr>
<th>Questions</th>
<th>Ratings</th>
<th>Gail</th>
<th>Dale</th>
<th>Bob</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>1. Acceptability of assessment procedures</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>2. Acceptability of treatment packages</td>
<td>7</td>
<td>7</td>
<td>7</td>
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<tr>
<td>3. Satisfaction with improvement in problem behavior</td>
<td>7</td>
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<td>6</td>
<td>6.7</td>
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<td>4. Helpfulness of consultation</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** 7=highly acceptable, highly satisfied, or very helpful  
1=not acceptable, not satisfied, or not helpful

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### IISCAs have led socially-validated outcomes

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### Personalized Social Validity Data

#### Parents' Comfort Level of Presenting the Evocative Situation

<table>
<thead>
<tr>
<th>Questions</th>
<th>Comfort Levels</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1. Taking away toys</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Goal 2. Telling child &quot;no&quot; when they ask for something</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Goal 3. Giving instructions</td>
<td>5</td>
<td>7</td>
<td></td>
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<tr>
<td>Goal 4. 1. Interrupting child's preferred activity and telling them to do homework or other non-preferred activity</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Goal 5. 1. Taking away DSS or iPad at meal times</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Goal 6. 3. Interrupting or correcting math work</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** 7=very comfortable  
1=not comfortable.
**Treatment Review**

**Personalized** and **synthesized** reinforcers delivered **intermittently, unpredictably, and exclusively** following various chain lengths of appropriate behavior that includes **communication, toleration, and compliance**

- The treatment is implemented in the most challenging context that is sufficiently convenient to repeatedly arrange
  - Referred to as the “two Cs” of context
The treatment process begins by providing personalized and synthesized reinforcers for each and every problem behavior and then for each and every communication response.

- Trust is built by arranging for easy responses to reliably and immediately result in all reinforcers.

The first communication response taught is referred to as the Simple Functional Communication Response (sFCR)

- The key features of an sFCR:
  - Simple (Horner & Day, 1991)
  - Novel (Derby et al., 1998)
  - Omnibus ("My way") (Hanley et al., 2014)
  - Can be effectively prompted

Shaping of the functional communication response continues (Ghaemmaghami et al., 2018)

...until it contains:

- An obtaining a listener response (e.g., "Excuse me")
- A generative autoclitic frame (e.g., "May I have _____")
- A social nicety
- Proper tone, pace, volume, articulation

It is then referred to as a Complex Functional Communication Response (cFCR)

(e.g., "Excuse me [pause, wait for acknowledgement], May I have my way, please?")
The cFCR is sometimes differentiated into specific mands
(Ward et al., 2018)

- An obtaining a listener response
- A break response
- An access to preferred toys response
- An attention recruitment response

(e.g., “Excuse me” [pause, wait for acknowledgement], “May I have a break, please?”
... “May I have my stuff please” ... “Will you play with me”)

A tolerance response is then taught
(Hanley et al., 2014; Santiago et al., 2016; Ghaemmaghami et al., 2016)

Now Sr is intermittent and unpredictable

Typical 5-trial sequence in early chaining phase:

<table>
<thead>
<tr>
<th>Trial 1 Sr</th>
<th>Trial 2 Sr</th>
<th>Trial 3 Sr</th>
<th>Trial 4 Sr</th>
<th>Trial 5 Sr</th>
</tr>
</thead>
<tbody>
<tr>
<td>cFCR</td>
<td>TR</td>
<td>cFCR</td>
<td>cFCR</td>
<td>TR</td>
</tr>
</tbody>
</table>

Sr = synthesized reinforcement

cFCR = complex functional communication response

TR = tolerance response

*We just introduced disappointment and ambiguity at the same time—we stay here until there are no negative emotional responses*

Then chaining of contextually appropriate behavior (CAB) and
more Sr intermittency and unpredictability follows

Typical 5-trial sequence in early chaining phase:

<table>
<thead>
<tr>
<th>Trial 1 Sr</th>
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</thead>
<tbody>
<tr>
<td>cFCR</td>
<td>1hCAB</td>
<td>2eCAB</td>
<td>TR</td>
<td>3eCAB</td>
</tr>
</tbody>
</table>

Sr = synthesized reinforcement

cFCR = complex functional communication response

TR = tolerance response

eCAB = easy contextually appropriate behavior

(e.g., completion of mastered task; play with alternative but preferred materials)

hCAB = hard contextually appropriate behavior

(e.g., accurate completion of challenging math problems; independent play w/ mundane toys)
The average chain length gets progressively longer as success is experienced at each step.

<table>
<thead>
<tr>
<th>Step</th>
<th>Trial 1 Sr:</th>
<th>Trial 2 Sr:</th>
<th>Trial 3 Sr:</th>
<th>Trial 4 Sr:</th>
<th>Trial 5 Sr:</th>
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<tbody>
<tr>
<td>1</td>
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<td>TR</td>
<td>1eCAB</td>
<td>2eCAB</td>
<td>1eCAB</td>
<td>4.6</td>
<td>3-6</td>
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<tr>
<td>2</td>
<td>1eCAB</td>
<td>2eCAB</td>
<td>cFCR</td>
<td>TR</td>
<td>1eCAB</td>
<td>4.6</td>
<td>3-6</td>
</tr>
<tr>
<td>3</td>
<td>TR</td>
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<td>cFCR</td>
<td>3hCAB</td>
<td>1hCAB</td>
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<td>3-7</td>
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<tr>
<td>4</td>
<td>3eCAB</td>
<td>cFCR</td>
<td>1hCAB</td>
<td>TR</td>
<td>2eCAB</td>
<td>5.6</td>
<td>3-9</td>
</tr>
<tr>
<td>5</td>
<td>TR</td>
<td>5eCAB</td>
<td>cFCR</td>
<td>3hCAB</td>
<td>1eCAB</td>
<td>5.6</td>
<td>3-9</td>
</tr>
<tr>
<td>6</td>
<td>2hCAB</td>
<td>cFCR</td>
<td>4eCAB</td>
<td>TR</td>
<td>6eCAB</td>
<td>6.2</td>
<td>3-10</td>
</tr>
<tr>
<td>7</td>
<td>cFCR</td>
<td>6hCAB</td>
<td>TR</td>
<td>4hCAB</td>
<td>2eCAB</td>
<td>6.2</td>
<td>3-10</td>
</tr>
<tr>
<td>8</td>
<td>3eCAB</td>
<td>5hCAB</td>
<td>TR</td>
<td>7hCAB</td>
<td>1eCAB</td>
<td>6.8</td>
<td>3-11</td>
</tr>
<tr>
<td>9</td>
<td>TR</td>
<td>10eCAB</td>
<td>cFCR</td>
<td>2eCAB</td>
<td>7hCAB</td>
<td>7.6</td>
<td>3-13</td>
</tr>
<tr>
<td>10</td>
<td>2hCAB</td>
<td>7eCAB</td>
<td>10hCAB</td>
<td>TR</td>
<td>7.6</td>
<td>3-13</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2eCAB</td>
<td>10hCAB</td>
<td>13eCAB</td>
<td>TR</td>
<td>8.8</td>
<td>3-16</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>TR</td>
<td>13eCAB</td>
<td>2hCAB</td>
<td>cFCR</td>
<td>10hCAB</td>
<td>8.8</td>
<td>3-16</td>
</tr>
</tbody>
</table>

Typical 5-trial sequence in later chaining phase:

<table>
<thead>
<tr>
<th>Trial 1 Sr:</th>
<th>Trial 2 Sr:</th>
<th>Trial 3 Sr:</th>
<th>Trial 4 Sr:</th>
<th>Trial 5 Sr:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10hCAB</td>
<td>3eCAB</td>
<td>20hCAB</td>
<td>TR</td>
<td>cFCR</td>
</tr>
</tbody>
</table>

- Sr = synthesized reinforcement
- cFCR = complex functional communication response
- TR = tolerance response
- eCAB = easy contextually appropriate behavior
- hCAB = hard contextually appropriate behavior

By last step: Average 10 responses per Sr (range, 3-23)

Some emphases:

- Progressively increase the average amount of behavior (not just time) required to terminate the delay (Ghaemmaghami et al., 2016)
- Terminate the delay for various amounts of behavior
  sometimes expect very little behavior, sometimes expect longer or more complex types of behavior during the delay
- Probably best to not signal how much behavior is required to terminate the delays
At the end of treatment:
many appropriate behaviors do not yield reinforcement immediately, but there is no delay to reinforcement per se.

Consider this last practice session:

<table>
<thead>
<tr>
<th>Trial 1 Sr.</th>
<th>Trial 2 Sr.</th>
<th>Trial 3 Sr.</th>
<th>Trial 4 Sr.</th>
<th>Trial 5 Sr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10hCAB</td>
<td>3eCAB</td>
<td>20hCAB</td>
<td>TR</td>
<td>eFCR</td>
</tr>
</tbody>
</table>

Due to chaining of appropriate responses

And, non-reinforcement of a response (e.g., a mand) induces another appropriate response (e.g., tolerance response) as opposed to problem behavior.
The average chain length is progressively increased, but communication, toleration, and short/unexpected contextually-appropriate behavior chains are reinforced sometimes, even at the end of treatment.

Shorties never go away.

This way we keep hope alive!

Surprise shorties are a must!

Same treatment can be applied to stereotypy that interferes with learning with socially meaningful effects.
Permission based model in which communication, toleration, & contextually appropriate behaviors are strengthened  
(adapted from Hanley, Jin, Vanselow, & Hanratty, JABA, 2014; will be described in Slaton, Hanley, Ruppel, & Gage, in preparation)

1. Teach child to request access to stereotypy  
   via momentary restriction & contingent access to stereotypy
2. Teach child to tolerate denials of mands for stereotypy  
   via contingent, intermittent, & unpredictable access to stereotypy
3. Teach child to engage in contextually appropriate behavior  
   via prompting & contingent, intermittent, & unpredictable access to stereotypy

freedom
from problem behaviors
common among persons with autism
that diminish that person’s and their family’s quality of life
is attainable

It is attainable  
by first understanding*  
why the child is engaging in the problem behavior

understanding can be realized quickly, safely, and analytically
It is attainable when children are taught skills to help them navigate our complex social world

* Communication, Tolerance, and Contextually approp. behavior

It is attainable when the skills are maintained via unpredictable and intermittent reinforcement which is probably the same arrangement that generated the various forms of problem behavior

For more information go to: www.practicalfunctionalassessment.com

Many thanks to my Practical Functional Assessment and Treatment Research and Practice group:

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Questions?