



The treatment of rigid and repetitive behaviors associated with challenging behavior: A brief review and intervention outcomes from research

Wendy Machalicek, Ph.D., BCBA-D
Assistant Professor, Special Education
Dept. of Special Education & Clinical Sciences

Contributors

- Shaji Haq UO SPSY doc student
- Mallory Brown, Ph.D.
- Sarah Pinkelman, Ph.D., BCBA, George Mason University (past UO doc student)
- Mandy Rispoli, Ph.D., BCBA-D, Texas A & M University

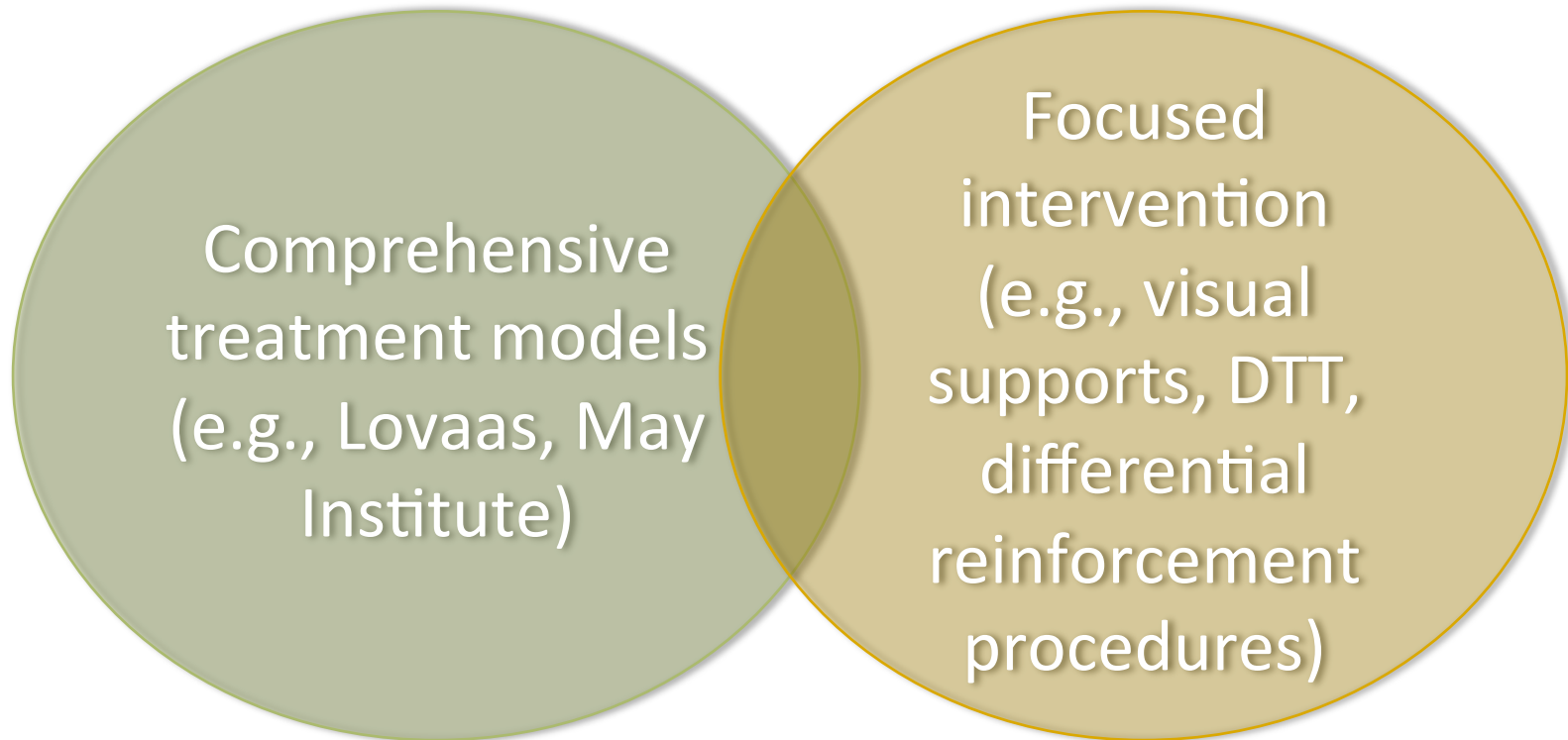
Outline of today's talk

- Restricted, repetitive patterns of behavior, interests, or activities
RRBIs as a behavioral intervention goal for children with ASD
- Brief review of current theory and state of evidence for behavioral intervention of RRBIs
- Results of a recent single-subject research design study
- Discussion of practice implications and future research
- Questions

Core features of autism spectrum disorder (DSM-V)

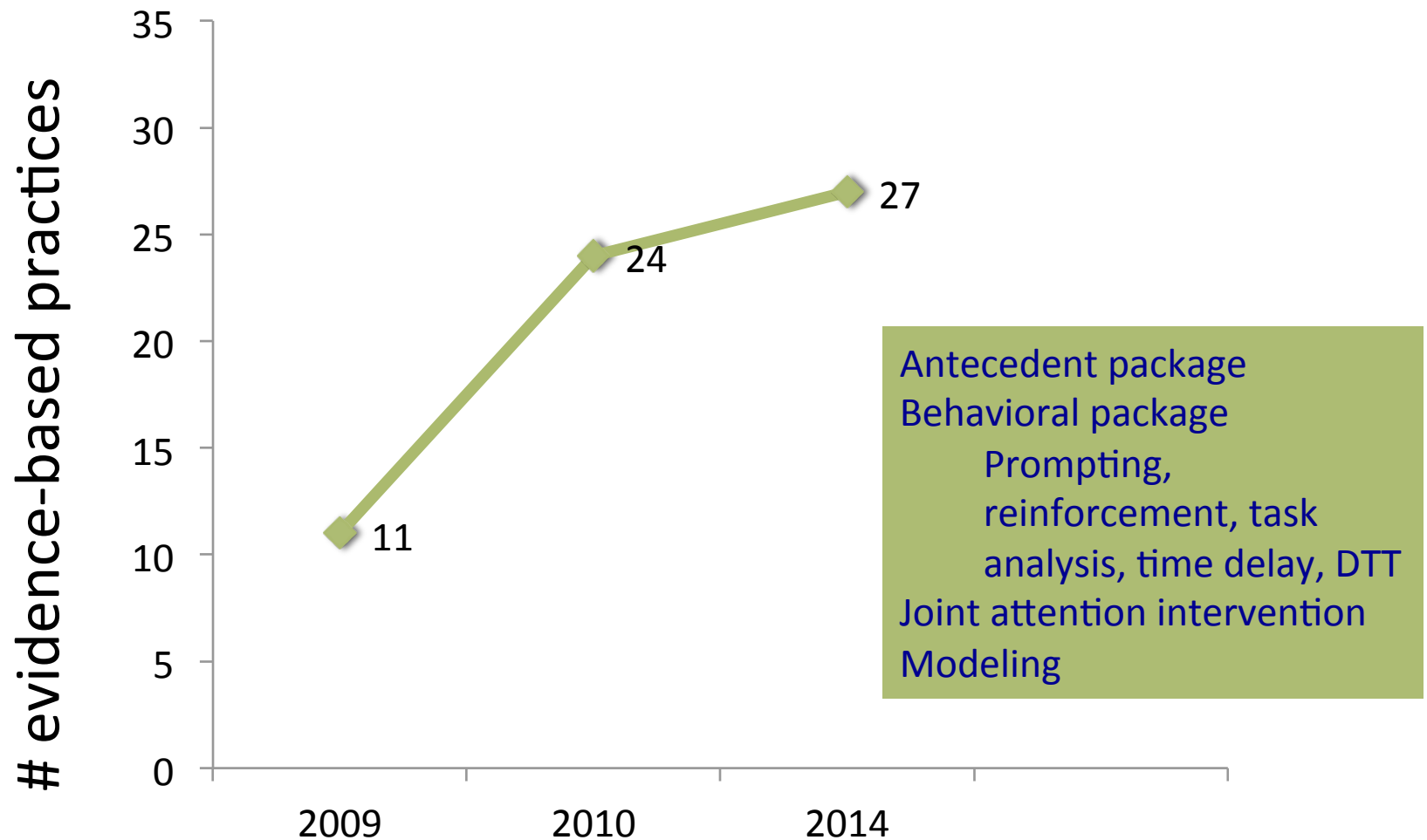
- A. Persistent deficits in social communication and social interaction across contexts
- B. Restricted, repetitive patterns of behavior, interests, or activities as manifested by at least two symptoms
- C. Symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities)
- D. Symptoms together limit and impair everyday functioning.

Two major categories of intervention



e.g., Odom et al., 2010; Vismara & Rogers, 2010

Growing number focused interventions with “established” status



Number of evidence-based practices identified to treat symptoms of autism spectrum disorder (National Autism Center 2011, National Professional Development Center on ASD; NPDC 2010 and 2014)

Core features of autism spectrum disorder (DSM-V)

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- Strong attachment to/
preoccupation with
 - unusual objects/toys
 - excessively circumscribed or perseverative interest
- Non-functional or developmentally inappropriate behaviors (e.g., school age children mouthing toys)
- Child engages in self-stimulatory behaviors with object (e.g., flapping book in front of eyes)



APA (2013) Diagnostic and Statistical Manual of Mental Disorders

- Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal/ nonverbal behavior
 - extreme distress at small changes
 - difficulties with transitions
 - rigid thinking patterns
 - greeting rituals
 - need to take same route or eat food every day



APA (2013) Diagnostic and Statistical Manual of Mental Disorders

In support of intervening early

- Present early in life for children with autism w/many forms of repetitive behavior present by 2-3 yrs of age
- Preventing child from engaging in RRBIs can lead to “outburst” of challenging behavior



Green et al., 2006; Mercier et al., 2000; Mooney et al., 2006; Peters-Scheffer et al., 2008; Honey et al., 2008; Richler et al. 2007; Sigafos, Green, Payne, O'Reilly, & Lancioni, 2009

What function do such behaviors serve for children with ASD?

- Reinforcement contingencies
 - Automatic reinforcement
 - Social positive
 - Non-social positive
 - Reinstate access to ritual (Rispoli, Carmargo, Machalicek, Lang, Sigafoos, 2014)
 - Negative reinforcement

Cunningham & Schreibman, 2008; Hutt & Hutt, 1965; Zentall & Zentall, 1983

Interventions to decrease repetitive behaviors in ASD: State of the evidence

Patterson, Smith, & Jelen (2010)

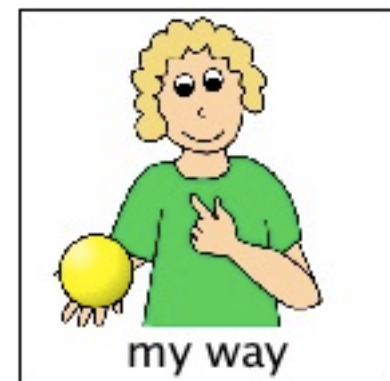
- Few interventions exist and those that do often lack assessment of operant function of behavior
- 10 single subject research design studies reviewed, 17 participants, median sample size of 1
- Common interventions
 - Non-contingent reinforcement (NCR) alone or with other interventions such as response blocking, matched stimulation (4 of 10 studies)
 - Differential reinforcement
 - Functional communication training (1 study)

Other interventions

- Environmental enrichment (e.g., Sigafoos, Tucker, Bushell, & Webber, 1997)
 - Teaching functional toy play/leisure activities
- Differential reinforcement incompatible behavior (DRI; e.g., Matson, 1982)
- Verbalization of coping statements during repeated exposure sessions (Lehmkuhl, Storch, Bodfish, & Geffken, 2008)
- Extinction (Rincover, Newsom, & Carr, 1979)

Growing body of literature on use of functional communication training (FCT; Carr & Durand, 1985) to decrease repetitive behaviors

- FCT packages may be an effective treatment for such challenging behavior (e.g., Hanley, Iwata, & Thompson, 2001; Hagopian, Boelter, & Jarmolowicz, 2011; Hausman et al., 2009; Kuhn et al., 2009; Rispoli et al., 2014)



Disadvantages of using FCT

- Potential overuse of mand (Fisher et al., 1993)
- Natural situations where reinforcement not available
- Resurgence, limited effectiveness in natural settings with parents, teachers (Fisher, Thompson, Hagopian, Bowman, & Krug, 2000)

1 way to overcome disadvantages of FCT

- Signaled availability of reinforcement to assist with stimulus control
 - Kelly, Lerman, Fisher, Roane, & Zangrillo, 2011
 - Ringdahl, Call, Christensen, & Boelter, 2010
 - Betz, Fisher, Roane, Mintz, & Owen, 2013

- Rispoli et al. (2014) successfully utilized a signaled delay to reinforcement procedure to fade the reinforcer following FCT intervention
 - Schedule thinning following FCT + EXT consisted of “Teacher/Parent way” first, then free access
 - Timer set, when timer ended free access to perseverative play
 - Other toys available during extinction trials
 - Communication acts to reinstate the ritual continued during the extinction phase
 - Doesn’t allow for brief interruption of perseverative play during intervention

Ways to overcome disadvantages of FCT, cont.

- Hanley, Iwata, & Thompson, 2001
- Evaluated various schedules of reinforcement following FCT to determine which schedule resulted in lower levels of replacement behavior while low levels of challenging behavior were maintained
- 3 adults with significant IDD in institutional setting
- Results
- Use of discriminative stimuli (a laminated card) in a multiple schedule that consisted of signaled periods of reinforcement or extinction was associated with low levels of problem behavior and only moderate use of replacement response

Purpose of current study

- Evaluate effectiveness of functional communication training + extinction or withholding consequences previously maintaining challenging behavior (FCT + EXT) and a fading phase consisting of multiple schedule of reinforcement on child challenging behavior and appropriate communication
 - When highly preferred, perseverative play is interrupted and no other toys are available

Replicates graduated multiple schedule methods of Hanley, Iwata, & Thompson (2001) in natural setting with young children with autism

Participants, target challenging behavior

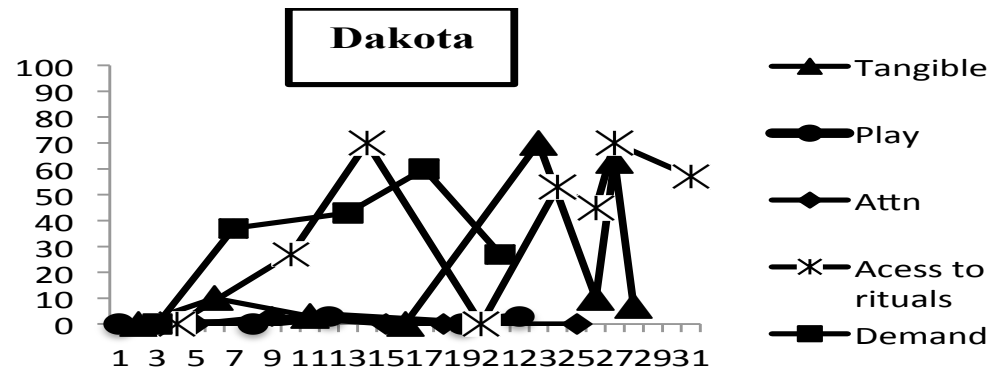
Pseudonym/ ASD severity	Highly preferred, perseverative activity identified with preference assessment	Challenging behavior
Anthony Moderate ASD	Repeat viewing of starting sequence of videogame Often engaged in hand wringing, body rocking while viewing videos	Crying, yelling, aggression, property destruction, hand biting, chin hitting, elopement
Dakota Severe ASD	Nonfunctional play with marble run Often engaged in hand flapping while playing	Whining, crying, yelling, aggression, property destruction
Thomas Moderate ASD	Ordering photo cards of desserts in proscribed sequence Often engaged in licking, rubbing while ordering cards	Whining, crying, yelling, aggression, head hitting, pulling eyelashes, elopement

Pseudonym	High preference, perseverative activity	Interruptions and FCT response
Anthony	Repeat viewing of videogame start. Associated with hand wringing, body rocking	<p>Asking for a turn, touching telephone, suggesting a different way to play (“let’s watch the whole video”)</p> <p>(Saying and/or handing card <i>Maybe later</i>)</p>
Dakota	Nonfunctional play with marble run Associated with hand flapping	<p>Touching marble run or marbles, blocking access to marble/portion of marble run, giving a verbal direction (“put it on the top”)</p> <p>Saying and/or handing card <i>My way</i></p>
Thomas	Ordering photo cards of desserts in proscribed sequence Associated with licking, rubbing cards and surfaces	<p>Asking for a turn, touching cards, suggesting different way to play (“I want to find all the strawberry desserts”)</p> <p>Saying and/or handing card <i>No thanks</i></p>

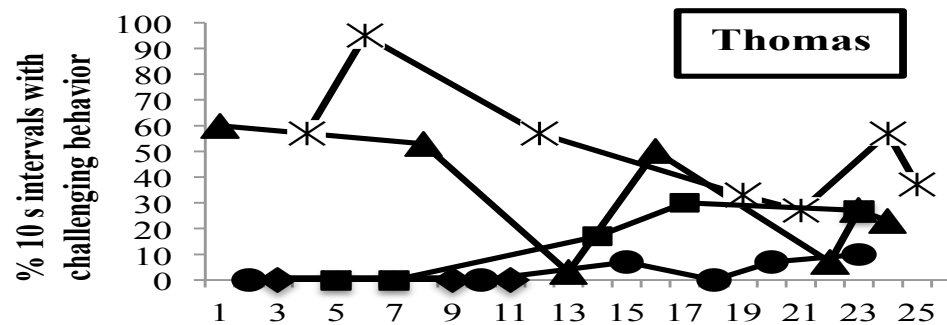
Phase I: Preession assessment, cont.

- Experimental functional analysis (Iwata et al., 1994)
- Demand, attention, play, tangible, ritual reinstatement
 - Ritual reinstatement (Rispoli, Camargo, Machalicek, Lang, & Sigafoos, 2014. *Journal of Applied Behavior Analysis*)
 - Researcher interrupts child's routine every 30 s
 - Contingent upon target challenging behavior, interruption removed and child permitted to reinstate routine

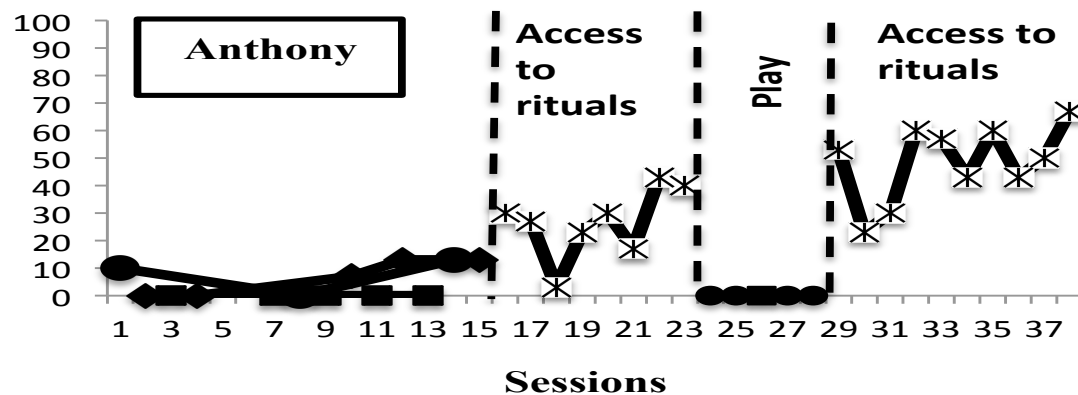
Functional Analysis Results for Dakota, Thomas, and Anthony



Access to rituals
Escape
Tangible

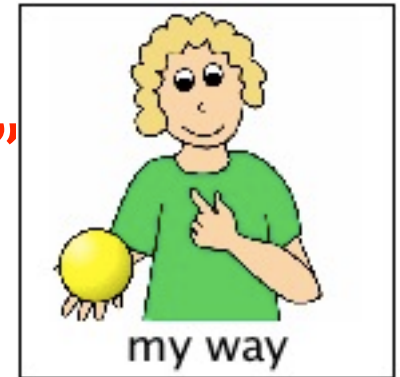


Access to rituals
Escape
Tangible



Access to rituals
Tangible
Attention

FCT + Extinction-EXT Intervention (“B”



- Review appropriate communication prior to interrupting routine (If you want me to stop say, “No thanks” and hand me card)
- Play interrupted q 30 s and most to least prompts with 3 s constant time delay used to teach communication response
- If target communication behavior exhibited, brief praise + 30 s reinstatement of routine
 - If child engaged in challenging behavior, no attention was provided and interruption of the routine continued until the behavior had ceased
 - Following 10 s cessation of challenging behavior, target communication response (picture exchange) prompted

Multiple FR1-EXT schedule of reinforcement ("C" fading phase)

Schedule 1

FR-1

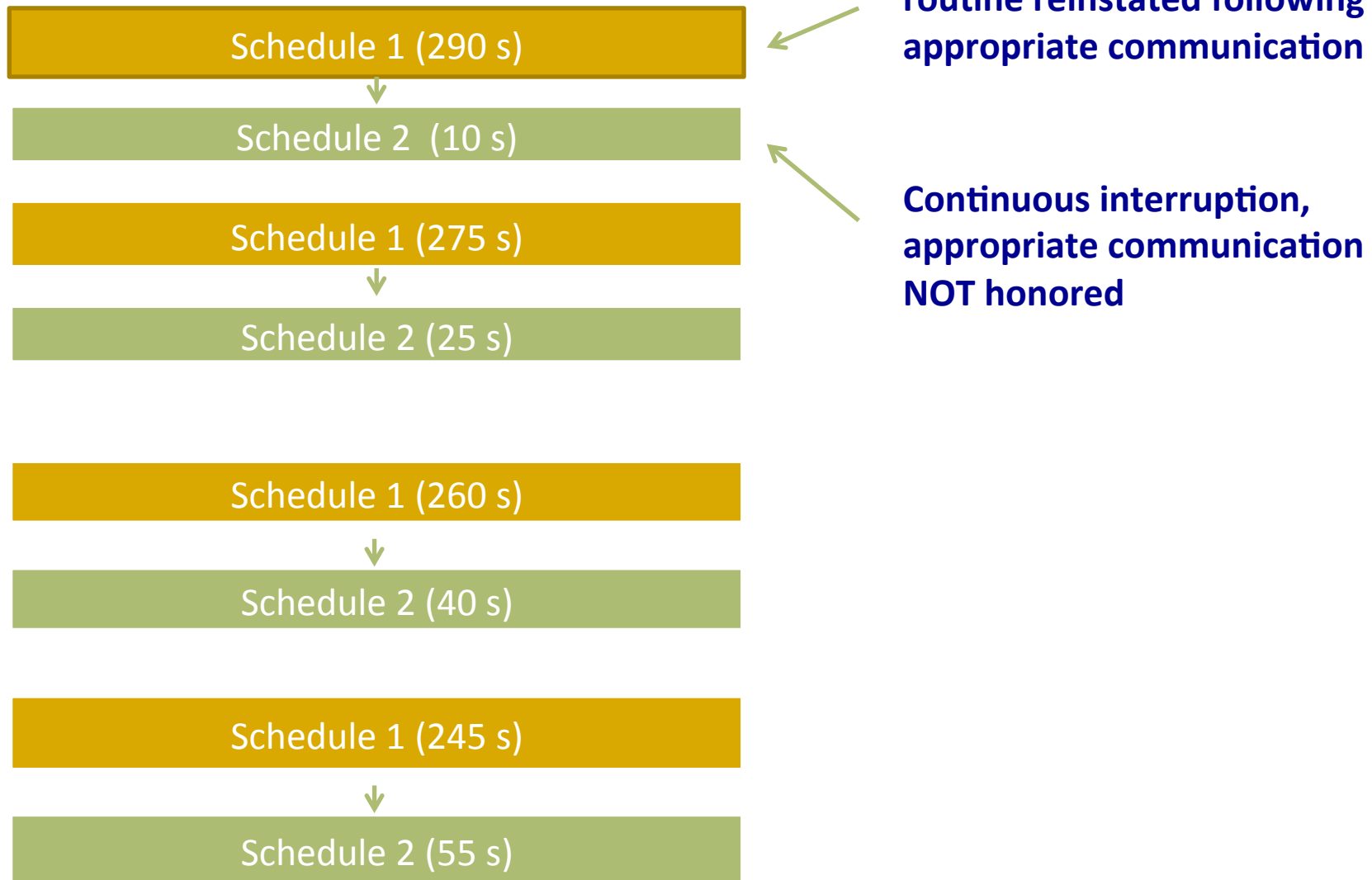
- ❖ Interruption q. 30 s with reinstatement of ritual play following FCT response. At end of Schedule A, discriminative stimulus for extinction (universal "stop" sign placed over FCT card, visual iPhone timer started) placed on table and Schedule B began.
- ❖ Challenging behavior placed on extinction.
- ❖ **Systematically decreased over time as schedule 2 took on more time**

Schedule 2

EXT-varying amount of time

- ❖ When FCT communication response used, interventionist praises (Nice asking, but it's my turn now), but does *not* stop interruption
- ❖ Challenging behavior placed on extinction.
- ❖ Following varying amt. wait time, Interventionist replaces FCT communication card and reinforces first appropriate communication response

FADING CRITERION: challenging behavior 90% below mean baseline levels for 3 consecutive assessment sessions



Interruption every 30 s., but routine reinstated following appropriate communication

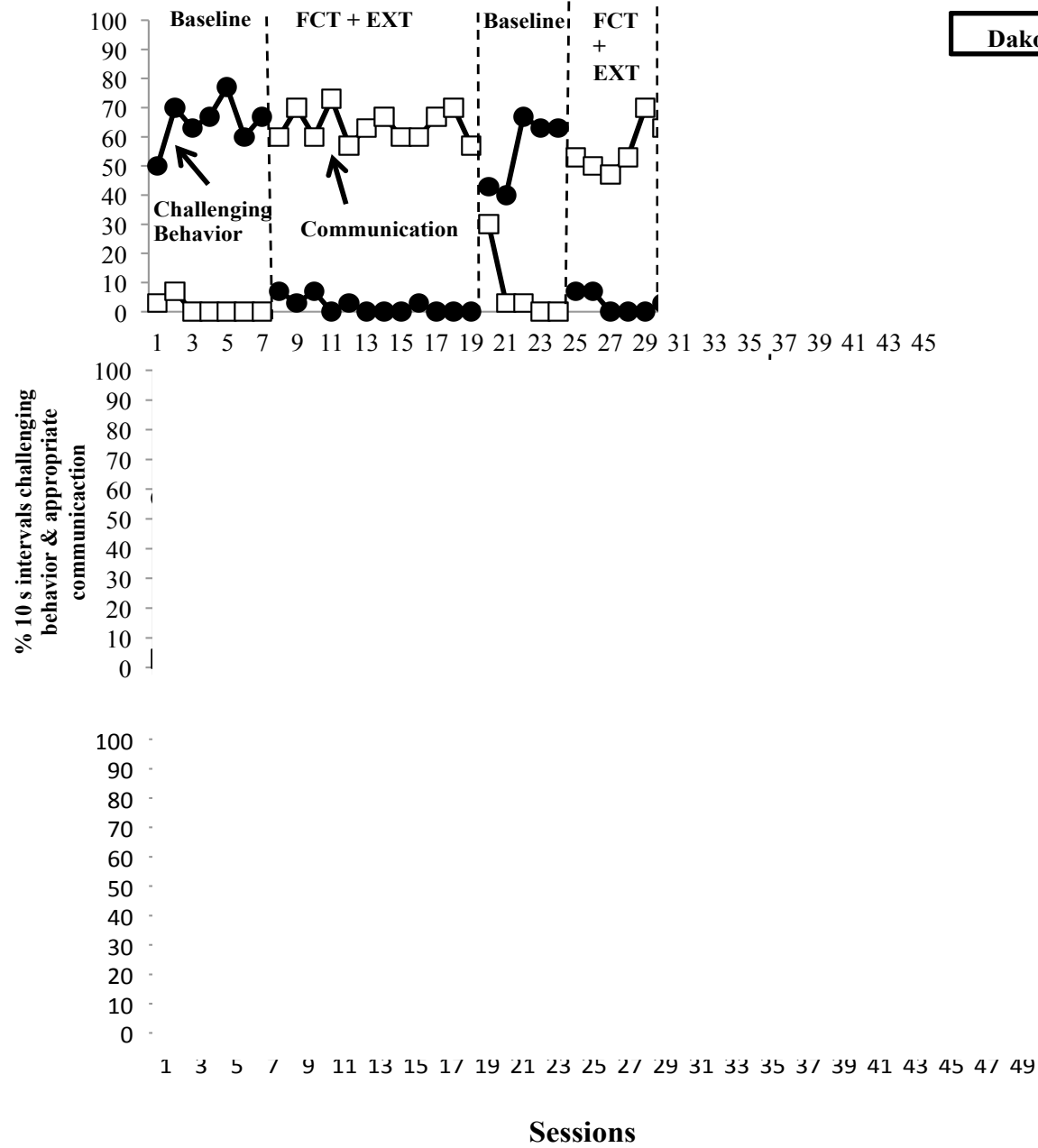
Continuous interruption, appropriate communication NOT honored

S^D



Multiple schedule

Dakota





- FCT + EXT can be used to effectively decrease challenging behavior associated with interruption of perseverative activities and improve functional communication
- Systematic fading through use of multiple schedule of reinforcement could be effective way to help children tolerate delayed reinforcement in natural settings

Suggestions for future research- Mechanism

- Potential mechanism of multiple schedule of reinforcement
- Stimulus control
- Does the first reinforcement schedule act as an abolishing operation to temporarily decrease the frequency of challenging behavior and value of perseverative play?
 - And if a longer duration of pre-session access to perseverative play results in decreased challenging behavior, why is that?

- Behavioral contrast (Williams, 2002)
- Generalized matching law (see Poling, Edwards, Weeden, & Foster, 2011 for review)

Suggestions for future research-Practice

- Evaluate use of discriminative stimuli during naturalistic intervention sessions-Will the use of these strategies allow teachers/parents to briefly interrupt perseverative play to occasion other appropriate communication without challenging behavior?

Suggestions for future research-Practice

- Compare utility and effectiveness of multiple schedules of reinforcement to other strategies for fading reinforcement following FCT
 - Delay schedules
 - Insert delay along with delay stimulus (e.g., Say wait) between alternative FCT response and delivery of reinforcer. Increase delays systematically, but look out for resurgence as result of ratio strain.
 - Demand fading
 - Increase # of demands before providing access to reinforcer
 - Response restriction (e.g., restrict access to SGD)
(see Hagopian, Boelter, & Jarmolowicz for review)

Questions?

wmachali@uoregon.edu