Effects of Function-Based Crisis Intervention on Severe Problem Behavior of Students with Autism

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Crisis Behavior

• Gilliam (1993) defines a crisis as "any occasion when a student's behavior requires immediate attention to protect the physical and/or psychological safety of that student, the teacher, or others." (p. 224)

Prevalence of Problem Behavior

- Individuals with Disabilities (Emerson et al., 2001):
 - Problem behaviors: 10-15%
 - Aggression: 7%
 - Destructive behavior: 4 5%
 - Self-injury: 4%

Prevalence of Problem Behavior

- Individuals with severe intellectual disability and/or autism spectrum disorder (ASD)
 - Aggression: 7.6 16.3%
 - Destructive behavior: 7.6 23.2%
 - Self-injury: 9.3 11.5%

Prevalence of Problem Behavior

 From a survey of parents of 1,380 students with ASD regarding aggression

	To Caregivers	To Non-Caregivers
Any aggressive behaviors	68% (938)	49% (676)
Physical aggression including hitting or biting	35.2% (486)	25.8% (356)
"Violence including the use of implements"	12% (1615)	5.8% (80)

Risks of Problem Behavior

- Injury to self and others
 - Burke, Hagan-Burke, & Sugai (2003)
- Receipt of medications with serious side-effects that rarely correct the causes of the behaviors
 - Powers (2005)
- Receipt of intrusive, ineffective interventions (e.g., punishment, exclusion)
 - Burke et al. (2003); Scott et al. (2005)
- Increased negative interactions
 - Lawson & O'Brien (1994)

School-Specific Risks of Problem Behavior

- Failure
- Disproportionate discipline
- Peer rejection
- Lack of social supports
 - Chandler & Dahlquist (2010)
- Poor post-school outcomes
 - Brosnan & Healy (2011)

Effects on Caregivers

- Lack confidence
 - Allen& Tynan (2000)
- Increased levels of stress
 - Freeman (1994)
 - Hastings & Brown (2002)
 - Jenkins, Rose, & Lovell (1997)

Potential Solution?

Function-Based Intervention

Crisis Intervention

Function-Based Interventions

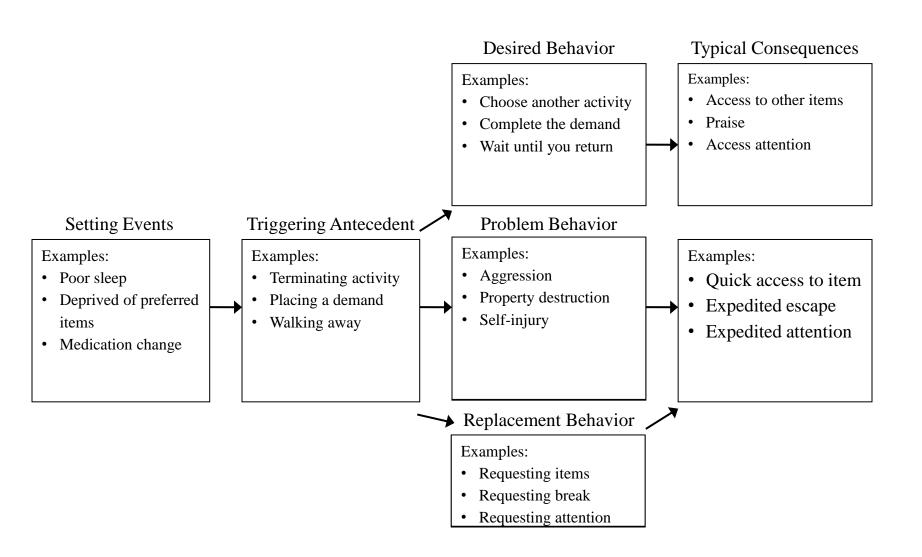
- Two major components:
 - Functional Behavior Assessment (FBA)
 - Intervention based on the identified function(s)

FBA

Steps

- Gathering information through the use of indirect and direct assessments.
- Developing a hypothesis about the function of the behavior.
- Testing the hypothesis via functional analysis
- Assessment includes stimuli that:
 - Evoke behavior (i.e., antecedents or stimulus events)
 - Maintain behavior (i.e., consequences)
 - Alter the strength of consequences (i.e., setting events)

Competing Behavior Pathways



Function-Based Intervention

- Once the function has been identified, a plan is created to:
 - a) Minimize evocative stimuli
 - b) Teach *replacement* behaviors
 - Increase the replacement behaviors via reinforcement
 - Decrease problem behavior by withholding reinforcement (i.e., extinction)

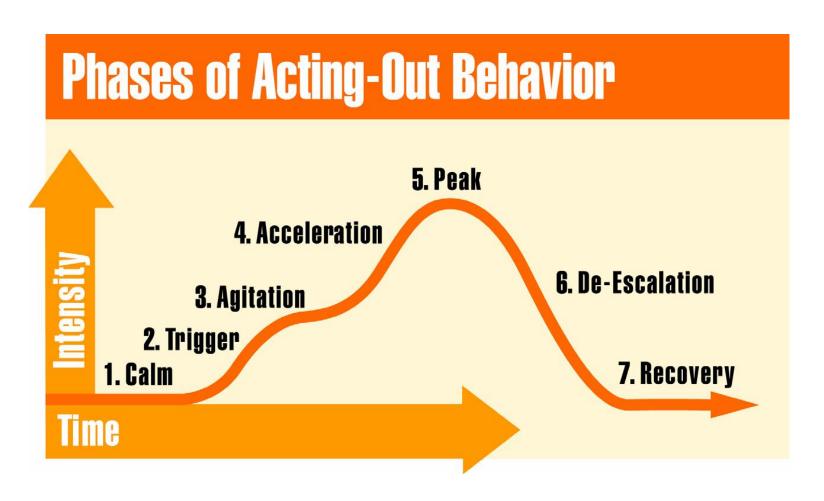
Crisis Intervention

- Focus on the topography of the problem behavior
- Process
 - Divide the escalation to and recovery from problem behavior into distinct phases
 - Operationally define each phase
 - Design interventions for each phase
 - Escalation Prevention
 - Crisis Safety
 - Recovery Reintegration

Some Crisis Intervention Models

- Life Space Crisis Intervention
 - Dawson, 2003; D'Oosterlinck, Goethals, Boekaert, Schuyten, & De Maeyer, 2008; Grskovic & Goetze, 2005; Soenen, Volckaert, D'Oosterlinck, & Broekaert, 2014)
- Strategies in Crisis Intervention and Prevention
 - Baker & Bissmire (2000)
- Nonviolent Crisis Intervention (CPI)
 - Ryan, Peterson, Tetreault, & Vander Hagan (2007)
- Cycle of Acting-Out Behavior
 - Colvin & Scott (2014)
- Cycle of Meltdowns for Students with Autism Spectrum Disorder
 - Colvin & Sheehan (2012)

Cycle of Acting-Out Behavior



Cycle of Acting-Out Behavior

Phase	Intervention Focus	
Calm	Teach replacement behaviors	
Trigger	Minimize triggers	
Agitation	Allow access to calming activities	
Acceleration	Non-threatening interaction and limit setting	
Peak	Safety	
De-escalation	Prepare for reintegration (e.g., isolate, engage in independent work, restore environment)	
Recovery	Reintegration	

Why Function Based Interventions?

- Decades of research demonstrating its effectiveness with individuals with moderate/severe disabilities, dating back to Carr (1977)
 - Beavers, Iwata, & Lerman (2013)
- Research has shown this approach to be more effective than non-function based approaches
 - Filter & Horner (2009); Mustian (2010)

Why not Function-Based Interventions?

- Some function-based strategies may difficult with crisis behaviors (e.g., extinction for attention maintained self-injury)
- Publications rarely describe procedures used to maintain safety with replicable precision.
 - Borrero et al. (2010); Fritz, Iwata, Hammond, & Bloom (2013);
 Harding, Wacker, Berg, Barretto, & Rankin (2002); McClean & Grey (2012); Schmidt, Drasgow, Halle, Martin, & Bliss, (2014)
- Staff lack confidence, and are highly stressed already. Put in stressful situations what do we think the fidelity of intervention will be?
 - "Disciplined responses are difficult to make when one's safety is threatened. Therefore, potential crisis situations should be identified, crisis management plans developed, and interventions rehearsed prior to an actual crisis" (Gilliam, 1993, p. 235).

Why Crisis Intervention?

- Increases safety
 - Williams (2009)
- Increases staff confidence and ability to intervene
 - Baker & Bissmire (2000); Dawson (2003); Soenen et al. (2009)
- Reduces restraint
 - Ryan et al. (2007)
- Lays out the specific steps staff should take to intervene
 - These steps should include physical management techniques, that are practiced until staff are able to implement them accurately enough to maintain the safety of all who are involved.
 - Gilliam (1993)

Why not Crisis Intervention?

- Only one study included individuals with DD and crisis behaviors were not reduced (Baker & Bissmire, 2000)
- Not designed for individuals with developmental disabilities (e.g., reliance on language across phases)
- Not conceptually systematic
 - Limits behavioral interventions to "pre-crisis" phases (e.g., calm, triggers)
 - Extinction is necessary in some cases (Fisher et al., 1993;
 Wacker et al., 1990)
 - FCT is mand training. Mand training is more effective when the EO is in place (i.e., agitation, acceleration; Carbone, 2013)

Why not both?

Purpose:

To investigate the effects of a treatment package, combining function-based intervention and crisis intervention, on the rates of severe problem behaviors for students with autism spectrum disorder.

Setting

- School:
 - Separate public school
 - Southeastern United States
- Within the school:
 - Kion and Pedro:
 - Conference room, approximately 10 ft x 20 ft
 - 3 tables for Kion
 - ▶ 1 table for Pedro
 - Daniel
 - Classroom
 - Split in half with an academic/work area and a break area
- The participant's teacher or paraprofessional was present for all sessions

Participants

Kion

- ▶ 18 years old
- African-american
- Male
- Autism spectrum disorder, severe cognitive disability
- Behavior: aggression

Pedro

- ▶ 16 years old
- Hispanic
- Male
- Autism spectrum disorder, severe cognitive disability
- Primary behavior: self-injury
- Secondary: aggression, property destruction

Daniel

- ▶ 18 years old
- African-american
- Male
- Autism spectrum disorder, severe cognitive disability
- Primary behavior: property destruction
- Secondary: self-injury

Interventionists

- Primary
 - Doctoral student in special education
 - Board certified behavior analyst
 - Crisis Prevention Intervention certified
 - Experience working with this population since 2004
- Secondary
 - MAT in Special Education
 - District level support for ASD classrooms
 - Crisis Prevention Intervention trainer
 - Experience working with students with ASD since 2003

Materials

Kion

- Work materials
- Preferred toys
- Picture symbol
- Timer

Pedro

- Leisure materials
- Visual schedule
- Timer

Daniel

- Work materials
- Preferred toys
- Timer

Experimental Design

- Delayed multiple probe
- Chosen for multiple ethical reasons
 - Avoid withdrawing a potentially effective intervention
 - Delay and probe to limit the number of baseline sessions

Dependent Variables

- Percent of Intervals with Challenging Behavior
 - ▶ 10 min sessions
 - ▶ 10 s intervals
 - Partial interval recording
- Broad Definitions
 - Crisis behavior: any behavior that requires immediate intervention to protect the safety of the participant or those around him
 - Gilliam (1993)
 - Precursor behavior. any behavior that reliably precedes the target behavior
 - ▶ Fritz, Iwata, Hammond, & Bloom (2013); Dracolby & Smith (2012)

Procedures

- Initial consent
- FBA
 - Identify function
 - ▶ Interview (Hanley et al., 2014)
 - 1-3 Observations
 - Functional Analysis (Iwata et al., 1982/1994)
 - Identify precursor behaviors (Fritz et al., 2013)
 - Draft intervention
- Opportunity for withdrawal
- Baseline
- Intervention

FBA Results and Individual DVs

Kion

- Function: access to tangibles
- <u>Crisis Behavior</u>: any time KW hits, scratches, or bites another person.
- <u>Precursor</u>: any time KW pushes, pulls, runs away, or actively resists physical prompting

Pedro

- Function: access to tangibles (primary); attention (secondary)
- <u>Crisis Behavior</u>: anytime PA (a) bites himself or pulls his hair; (b) hits, kicks, head butts, bites, or pushes another person; or (c) throws, knocks over, shakes, or hits property. All attempts and intensities are counted.
- Precursor: anytime PA whines, yells, grunts, or spits.

Daniel

- Function: access to tangibles; attention
- <u>Crisis Behavior</u>: anytime DF (a) hits himself in the head; (b) yells; or (c) throws, knocks over, or hits an inanimate object. All attempts and intensities are counted.
- Precursor: anytime DF (a) hits himself any place other than the head, (b) moves his materials/toys quickly and forcefully, or (c) urinates.

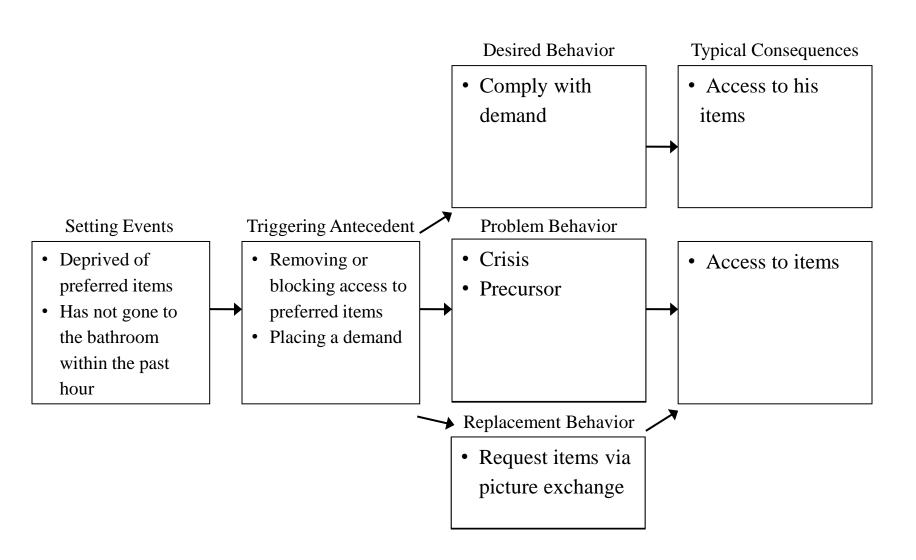
Baseline

- Identified challenging scenarios in the school day
- Selected one that matched the function for the challenging behavior
- Recreated that scenario in a controlled setting (e.g., conference room)
 - Example:
 - Function: access to toys.
 - Natural Scenario: transition from toys to work
 - <u>Baseline</u>: provide access to toys in conference room, then transition student from toys to work task

Function-Based Crisis Intervention (FBCI)

Phase	Intervention Focus	FBCI
Calm (Setting events)	Teach replacement behaviors	 Teach replacement behaviors Manage setting events Ensure access to high quality reinforcement
Trigger (Antecedent)	Minimize triggers	Minimize triggersMake triggers less aversive
Agitation (Bx Indication)	Allow access to calming activities	Prompt replacement behavior
Acceleration (Precursor)	Non-threatening interaction and limit setting	Prompt replacement behaviorDelay access to reinforcer
Peak (Crisis)	Safety	Maintain safetyWithhold or provide inferior quality reinforcement
De-escalation	Prepare for reintegration (e.g., isolate, engage in independent work, restore environment)	Provide neutral directionReview appropriate behavior
Recovery	Reintegration	Recreate initial environment

Kion – Competing Behavior Pathways



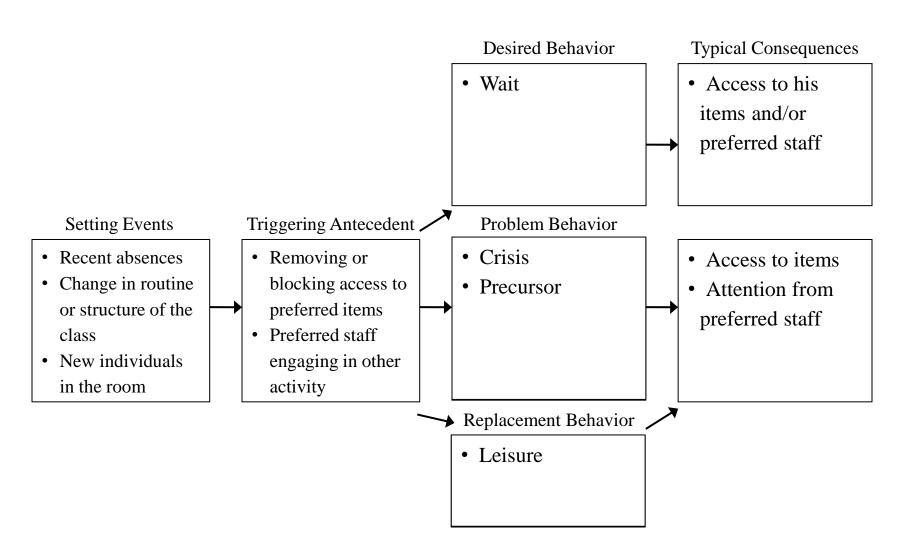
Kion (abridged version)

Phase	FBCI
Calm (Setting events)	 Ensure a minimum of I-min with preferred items Ensure he has access to communication card
Trigger (Antecedent)	 Provide I-min and 30-s warnings Provide a verbal and gesture cue for functional communication
Agitation (Behavioral Indication)	 Redirect, ensuring correct body positioning (standing slightly behind his shoulder or across the table) Use L→M prompting for functional communication Waiting – reminder to be calm
Acceleration (Precursor)	 Block access to items, ensuring correct body position Physically prompt functional communication Waiting – pause timer, provide reminder to be calm
Peak (Crisis)	 Use physical 2-person CPI escort to move Kion to table Maintain at table until absent of crisis for 30 s Waiting – stop timer
De-escalation	 Provide a neutral task to engage in until absent of precursor and crisis behaviors for 30 s
Recovery	 Review functional communication and reset timer Redirect back to original location, present trigger, and use L prompting for functional communication

Kion Schedule Thinning

Waiting Intervals						
I. VI 2 s	4. VI 15 s	7. VI 45 s	10. VI 2 min			
2. VI 5 s	5. VI 20 s	8. VI I min	II.VI 3 min			
3. VI 10 s	6. VI 30 s	9. VI 90 s	12. VI 5 min			
Criterion to progress intervals: waiting without exhibiting aggression or precursor behaviors for 100% of opportunities						
Criterion to regress intervals: waiting without exhibiting aggression or precursor behaviors for 40% or less of opportunities						

Pedro – Competing Behavior Pathways



Pedro (abridged version)

Phase	FBCI
Calm (Setting events)	 Provide attention Ensure access to preferred items for minimally I min
Trigger (Antecedent)	 Provide a 1-min and 30-s warning and 10-s countdown Set up visual schedule, allowing him to pick reinforcer Review how he earns the reinforcer, showing timer
Agitation (Bx Indication)	 Ensure correct body position (behind his shoulder, hand shadowing wrist) Neutrally redirect back to activity and timer Upon resuming activity, provide praise
Acceleration (Precursor)	 Pause timer and ensure correct body position Neutrally redirect back to activity Upon resuming activity, provide praise
Peak (Crisis)	 Ensure two-staff assume correct body position Block all attempts at crisis behavior Stop the timer
De-escalation	 Upon 30-s absence of crisis behaviors, neutrally prompt him to resume the activity Provide praise, but <i>do not</i> start the timer
Recovery	Reintroduce the visual scheduleReset and start the timer

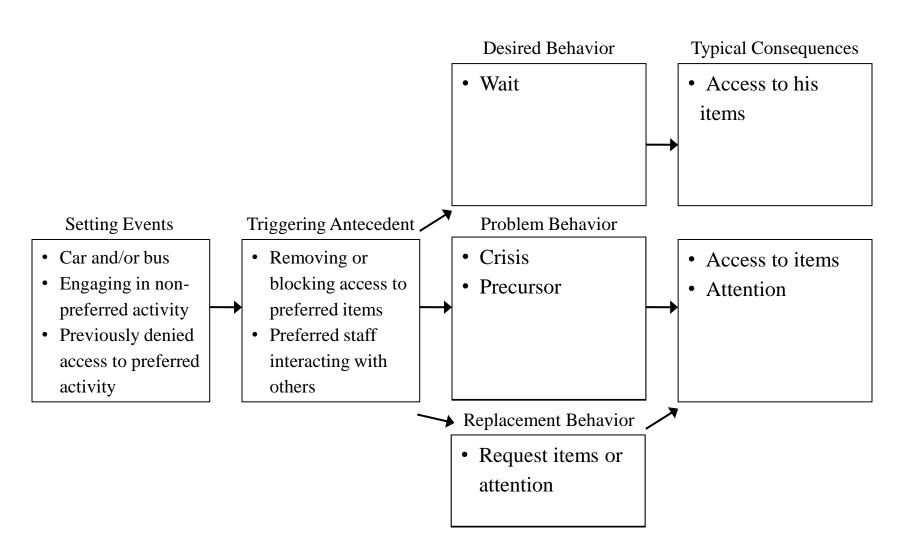
Pedro's Schedule Thinning

	Praise	Task		Praise	Task		Praise	Task		Praise	Task
I	CRF	FI 5 s	6	CRF	FI 60 s	Ш	VI 20 s	FI 90 s	16	VI 30 s	FI 3 m 30 s
2	CRF	FI 10 s	7	VI 5 s	FI 60 s	12	VI 20 s	FI 2 m	17	VI 30 s	FI 4 m
3	CRF	FI 20 s	8	VI 10 s	FI 60 s	13	VI 30 s	FI 2 m	18	VI 45 s	FI 4 m
4	CRF	FI 30 s	9	VI 15 s	FI 60 s	14	VI 30 s	FI 2 m 30 s	19	VI 45 s	FI 4 m 30 s
5	CRF	FI 45 s	10	VI 20 s	FI 60 s	15	VI 30 s	FI 3 m	20	VI I m	FI 5 m

Criterion to progress intervals: engaging in leisure without exhibiting aggression or precursor behaviors for 100% of opportunities

Criterion to regress intervals: engaging in leisure without exhibiting aggression or precursor behaviors for 40% or less of opportunities

Daniel – Competing Behavior Pathways



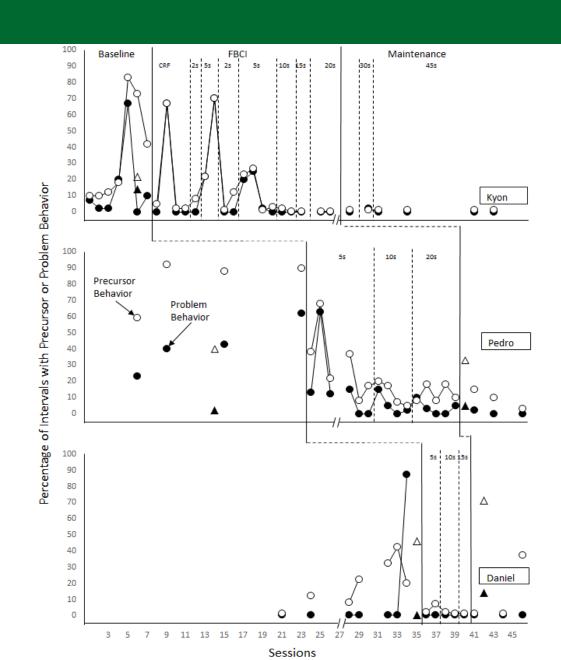
Daniel (abridged version)

Phase	FBCI
Calm (Setting events)	 Provide attention and/or access to preferred items minimally once per minute
Trigger (Antecedent)	 Provide a verbal warning prior to removing items and/or attention Provide a visual to show when he can access them again
Agitation (Bx Indication)	 Provide a verbal reminder when he will access his items/attention
Acceleration (Precursor)	 Provide a verbal prompt and model for functional communication Remove items that could be thrown and stand between him and windows
Peak (Crisis)	 Stand at least 10 feet back, limiting items that can be thrown and blocking windows Remind Daniel he needs to be calm to access his reinforcers
De-escalation	 Upon 30 seconds absent of crisis, redirect back to the demand Provide neutral praise for engaging in the task
Recovery	 Upon 30 seconds absent crisis and precursor, reintroduce the visual and the contingency (e.g., first, then)

Daniel's Schedule Thinning

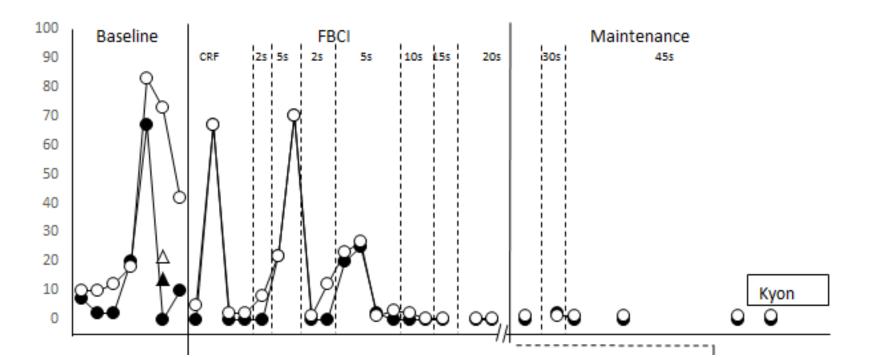
Waiting Intervals		
I. VI 30 s	4. VI 2 min	7. VI 10 min
2. VI I min	5. VI 3 min	8. VI 15 min
3. VI 90 s	6. VI 5 min	9. VI 20 min
Criterion to progress into precursor behaviors for 100	cervals: waiting without exhi	biting aggression or
Criterion to regress interprecursor behaviors for 40%	rvals: waiting without exhibited or less of opportunities	iting aggression or

Results



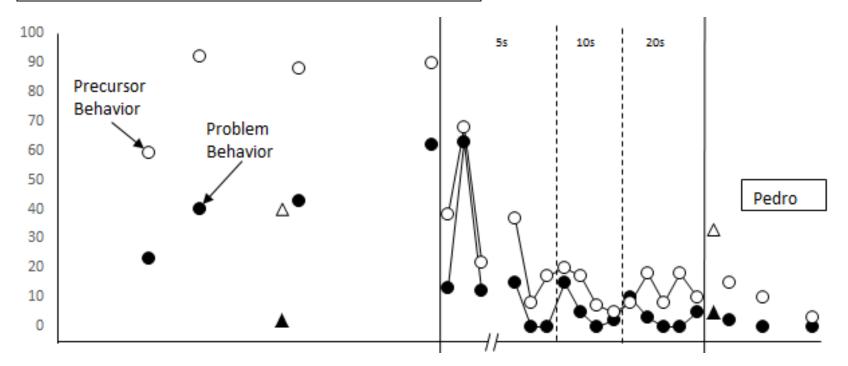
Kion

		Baseline	Intervention
Mana	Crisis	18%	9%
Mean	Precursor	35%	12%
Mass	Crisis	67%	70%
Max	Precursor	83%	70%
Min	Crisis	0%	0%
Min	Precursor	10%	0%



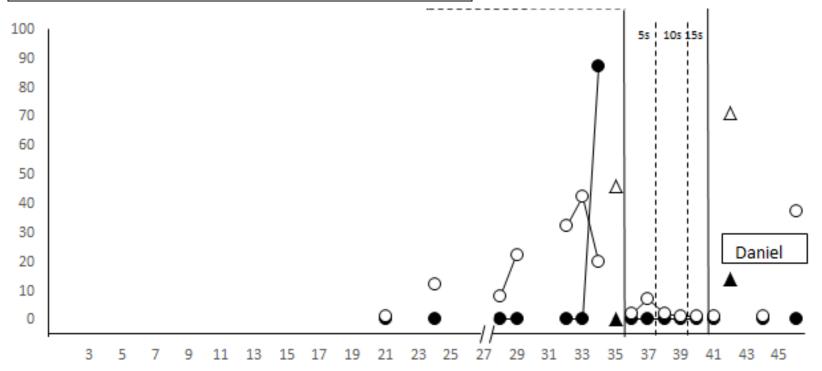
Pedro

		Baseline	Intervention
Mana	Crisis	42%	15%
Mean	Precursor	82%	28%
Mass	Crisis	62%	63%
Max	Precursor	92%	68%
Min	Crisis	23%	0%
Min	Precursor	59%	8%



Daniel

		Baseline	Intervention
Maan	Crisis	0%	0%
Mean	Precursor	20%	2.6%
Mass	Crisis	0%	0%
Max	Precursor	42%	7%
M* .	Crisis	0%	0%
Min	Precursor	0%	1%



Fidelity & Reliability

- Fidelity
 - ▶ 35% of sessions
 - ▶ 98.5% of steps implemented accurately
- Reliability
 - ▶ 37% of sessions
 - Crisis: 95%
 - Precursor: 93%
- Social Validity
 - Staff

Social Validity

- Teacher and two teacher assistants responded
- 5-point Likert scale (1 [strongly disagree]-5 [strongly agree])
 - Appropriate 5
 - ▶ Safe 4.67
 - ▶ Effective 5
 - ▶ Could be used 5
 - ▶ Should be used 5

Discussion

Function-based intervention and crisis intervention can compliment one another, with some minor adaptations

Phase	Intervention Focus
Calm (Setting events)	 Teach replacement behaviors Manage setting events Ensure access to high quality reinforcement
Trigger (Antecedent)	 Minimize triggers Make them less aversive
Agitation (Bx Indication)	 Allow access to calming activities, by prompting and reinforcing replacement behaviors
Acceleration (Precursor)	 Enforce limits by delaying access to reinforcement Continue to prompt replacement behavior to make the crisis behavior irrelevant
Peak (Crisis)	Maintain safetyWithhold or provide inferior quality reinforcement
De-escalation	 Provide neutral direction Shape appropriate behavior
Recovery	Review appropriate behavior Review initial environment for positive practice after the student is calm.

Limitations

- Interventionists were not natural to the setting
 - Conducted assessments, planned interventions, and implemented them
 - Still don't know the effects of FBCI on staff abilities
- Short sessions
 - If the intervention was expanded to the entire school day, would it maintain effectiveness?
- Did not generalize
 - Classroom staff did not implement intervention

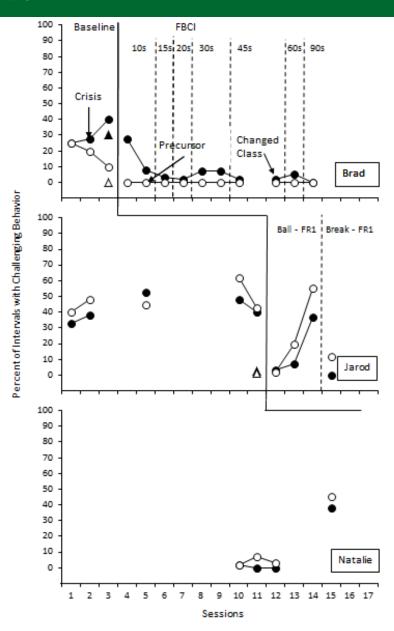
Implications for Practice

- When designing a behavior plan for students with crisis behaviors, be cognizant of crisis needs and function
 - Operationally describe steps to be taken for each phase of escalation
 - When describing these steps, be aware of the behavioral function
 - Change quality of reinforcement delivered between appropriate and inappropriate behavior
 - Prompt appropriate behavior before providing access to calming activities
 - Train until competent

Suggestions for Future Research

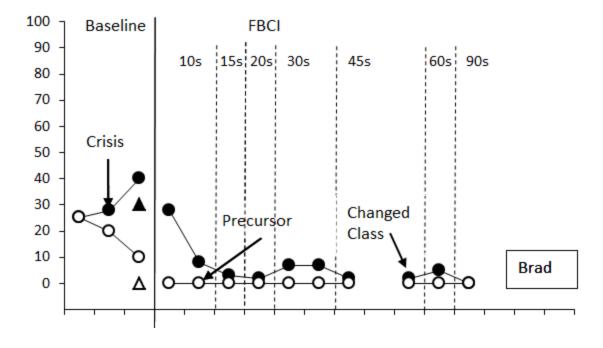
- Replicate
- Extend to natural interventionists
 - Intervention
 - Planning
 - Assess natural interventionists perceptions after implementing FBCI
- All reports should be clear with the steps taken to respond to crisis behavior

Current Data



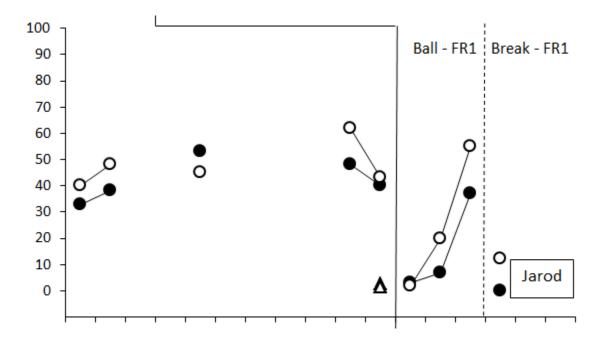
Current Data - Brad

		Baseline	Intervention
Maan	Crisis	31%	6.4%
Mean	Precursor	18.3%	0%
Mass	Crisis	40	28
Max	Precursor	25	0
Min	Crisis	25	0
Min	Precursor	10	0



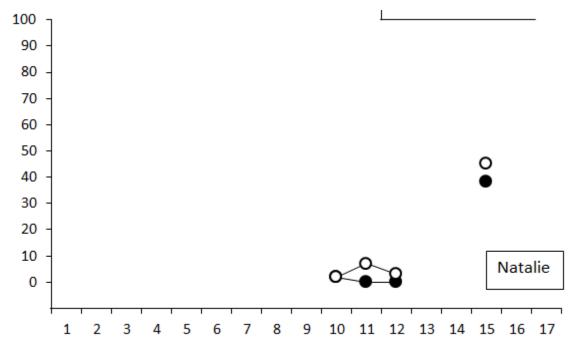
Current Data - Jarod

		Baseline	Intervention
Maaa	Crisis	42.4%	11.8%
Mean	Precursor	47.6%	22.3%
M	Crisis	53%	37%
Max	Precursor	62%	55%
N4 *	Crisis	33%	0%
Min	Precursor	40%	2%



Current Data - Natalie

		Baseline	Intervention
Mana	Crisis	10%	n/a
Mean	Precursor	14.3%	n/a
Mass	Crisis	38	n/a
Max	Precursor	45	n/a
Min	Crisis	0	n/a
Min	Precursor	2	n/a



KION Behavior Plan

Phase 1 - Functional Communication Training

Definitions

4

- Aggression anytime KION scratches, hits, and/or bites. All attempts are counted.
 Contact is not a criterion
- Precursor behaviors anytime KION pushes, pulls, physically resists redirection, hits an
 inanimate object, cries, whines, and/or yells
- Calm absence of aggression and precursor behaviors for 30 seconds.
- Functional Communication touches the appropriate communication card/picture

Criterion to progress to Waiting:

 Requesting toys without exhibiting aggression or precursor behaviors for 80% of opportunities for two consecutive sessions

erred items for 1 minute. Ortunity to go to the bathroom cation card/book. The between KION and his
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ninute and it's my turn) and
tion.
card and prompt him to touch
prompting
stic verbal praise and access to

section.

chosen item. Follow procedures in "Functional Communication"

Acceleration – KION exhibits precursor behavior s)	1. Ensure correct body positioning. 2. Block access to preferred items. 3. Redirect KION to his communication card and physically prompt him to touch it. 4. Upon touching card provide verbal praise and access to chosen item. Follow procedures in "Functional Communication" section.
<u>Peak</u> – KION exhibits aggression	Implement non-violent physical intervention to block attempts at aggression and escort KION to the table. Maintain KION at the table until he is absent of aggression for 30 seconds, blocking attempts to leave or engage in aggression. 2a. If KION does not exhibit aggression for 30 seconds, but continues to exhibit precursor behaviors, implement procedures in "De-escalation" section. 2b. If KION demonstrates calm, implement procedures in "Recovery" section.
De-escalation — absence of aggression for 30 seconds but still be resisting direction, crying, or whining	 Continue to stand behind KION, maintaining him in his chair. Provide a neutral task for him to engage in (e.g., puzzle, insertion task), using least to most prompting to complete it. a. Least to most – verbal → gesture → light physical → full physical Provide verbal praise for engaging in the task. If KION completes the task but is still exhibiting precursor behaviors, reset the task and begin again. Upon completing the task and exhibiting calm, provide verbal praise and implement procedures in "Recovery."
Recovery – calm	State "you need to ask for" Redirect KION back to original location. Use least to most prompting to ensure he requests the item. Provide verbal praise and honor request. Follow procedures in the "Functional Communication Training" section.

Questions?