Improving Sibling Interactions Using Acceptance and Commitment Training

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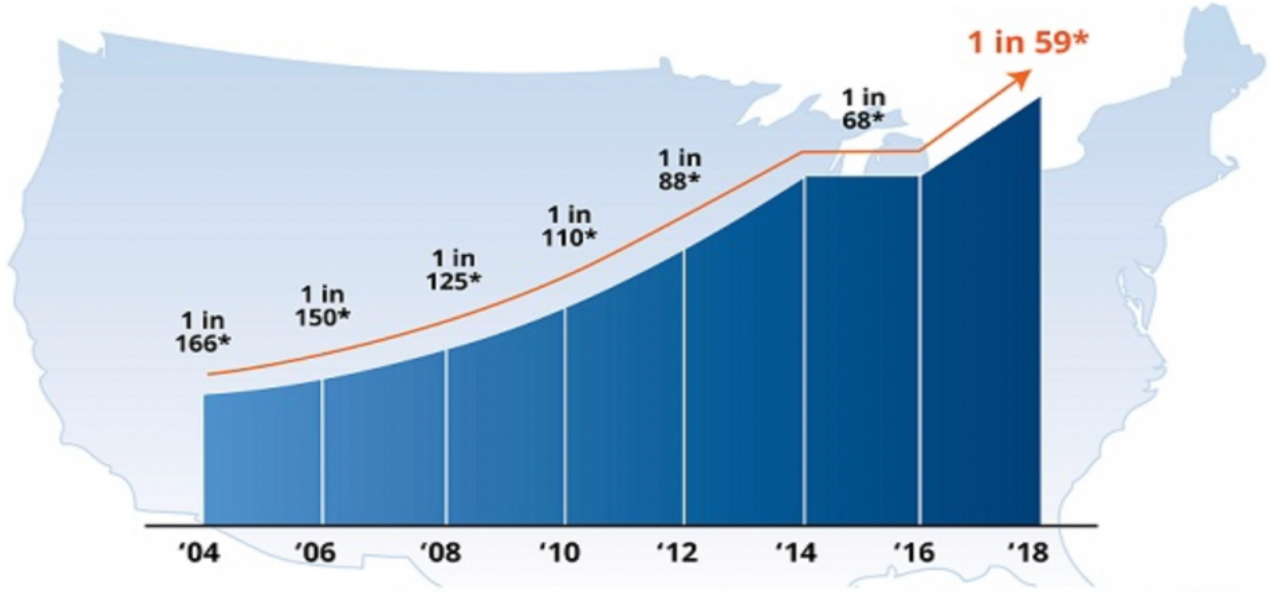
Prevalence of Autism in America

- WHO estimates that globally, 1 in 160 children live with autism (ASD).
- But in the USA, it is 1 in 59
- More than 3.5 million Americans live with an ASD. Prevalence of ASD in U.S. children increased by 119.4 percent from 2000 (CDC, 2019)
- As the rate of ASD diagnosis increases, so does the number of siblings and families whose lives are impacted
- Need for clinicians to teach families skills for interacting with kiddos with ASD



* Centers for Disease Control and Prevention (CDC) prevalence estimates are for 4 years prior to the report date (e.g. 2018 figures are from 2014)

Behavioral Literature on Sibling Relations

- Extensive research demonstrates the importance of sibling relationships
- Siblings are raised in the same household, spend considerable amount of time with one another, & share resources
- Daily interactions can positively impact developmental trajectories
- Siblings function as natural playmates, companions, & teachers
- Typical sibling rivalry exists and can be a normal part of life

(Bank et all., 2004; Kim et al., 2007; Noller, 2005)

Sibling Relations & ASD

- Behavior excesses and skill deficits of siblings w/ ASD (S-ASD) exacerbate rivalries
- Typically developing siblings (S-TD) may experience differential parental treatment in favor of S-ASD.
- S-ASD may acquire aversive functions (S^{DP} or S^{Δ}) for their S-TB
- Normal family activities and social interactions maybe limited and offer reduced access to reinforcement.

Barak-Levy, 2010; Glasberg, 2000; Kaminsky & Dewey, 2002; Meadan, Stoner, & Angell, 2009

Sibling Relations & ASD – *Behavioral Skills Training*

- Behavioral Skills Training (BST; Dib & Sturmey, 2007)
  - Instructions, modeling, rehearsal, & feedback
- Has been used to treat
  - Parent-Child dyads (Ward-Horner & Sturmey, 2008)
  - Staff-Child interactions (Sarokoff & Sturmey, 2008)
  - Child-Child peer-teaching of soccer skills (Chambers & Radley, 2019)
- These studies suggest that BST could be beneficial in teaching skills to S-TD that will help them with their S-ASD siblings

Sibling Interaction Comparisons

Skillful Sibling Behavior:	Unskillful Sibling Behavior:
1.) Playing or joining activities with each other.	1.) Engages in escape/avoidance behavior towards the sibling with ASD (e.g. playing alone, isolating self, refusing join activities, terminating play.)
2.) Sharing and taking turns.	2.) Engages in coercive behavior towards the sibling with ASD during play (e.g., excessive grabbing, snatching toys/activities, etc.)
3.) Using appropriate verbal communication/physical interaction.	3.) Engaging verbal/physical aggression towards sibling (e.g., profanity, teasing, rude comments, yelling, threats, pushing, pulling, pinching, etc.)
4.) Problem solving together in a functional manner (e.g. compromising).	4.) Overcontrolling/legitimizing why specific actions are needed in favor or TD sibling during interactions (e.g. we need to do it my way, you don't know how, and I had it first)

ABA Studies with Siblings

1) Leitenberg, Burchard, Burchard, Fuller, & Lysaght (1977) compared DRO to DRA to reduce sibling aggression
   - Both reduced sibling conflict by about 50%
   - DRO was easier for parents, but maintenance showed regression to baseline levels in both conditions

2) Schreibman, O'Neill, & Koegel, (1983) taught S-TD to use reinforcement & extinction
   - Young kids, not dug in (up to 10 years old)

3) James, & Egel (1986). Taught S-TD to model and prompt reciprocal interactions
   - Young kids, not dug in (up to 11 years old)

4) Celiberti, & Harris, (1993). Taught S-TD to prompt & reinforce their S-ASD to enhance play
   - Young kids, not dug in (up to 11 years old)

ABA Studies with Siblings

1) Taken together, these studies show
   - Direct contingency management works with younger children
   - To date, behavioral studies have not investigated the needs of adolescent S-TD / S-ASD dyads
   - Of specific concern are interactions between such dyads when some of the important variables affecting S-TD are outside the reach of the behavior consultant (e.g., parent behavior, reinforcers that parents respond to)

All Tangled Up!

All Tangled Up!

Thoughts of self	• I am always the one to get blamed when things don't go well • There must be something wrong with me
Thoughts of others	• My parents don't love me as much as they love my brother • My family always takes my brothers' side and doesn't listen to me
Predictions of future Outcomes	• He will just cry/tantrum again and ruin the fun • It'll just go bad like last time
Unhelpful Rule Following	• He should try to get along with me • It's not fair that they spend so much time with him • I'm supposed to be understanding
Reoccurring Worries	• I will get frustrated when I play with him • I will get annoyed • I will get embarrassed

Acceptance and Commitment Training (ACT)

ACT is a modern behavior analytic approach use to address socially significant behavior while addressing problematic barriers such as private events

ACT can be applied by ABA practitioners in a way that is consistent with an ABA scope of practice (Tarbox, Szabo, & Allen, in press)

ACT & Children

ACT has been found effective in treating a broad range of clinical needs across wide population of children:

- Children/Adolescences
- Adults
- Adult Individuals with disabilities
- Parents of children with ASD
- High Functioning kids with ASD

Successfully used to treat unwanted emotional responding, social skills, substance use, eating rigidity, health and wellness, impulsive behavior, parental interaction, athletic performance, and other issues

Blackledge & Hayes, 2006; Coyne et al., 2011; Dixon et al, 2014; Gould, Tarbox & Coyne, 2017; Harper, Web & Rayner, 2013; Szabo, 2018

How can ACT Help ABA Practitioners?

ACT can be applied in ways that are consistent with the 7 dimensions of ABA

There has been over a 1000 studies applied, across settings, people, to target various clinical concerns. Over 300 randomize controlled trials.

ACT can be useful when direct contingency management is ineffective, inefficient, or unavailable

Private events that influence overt behavior can be addressed when targeting socially important overt behavior

What about ACT with Sibling Relationships ?

Currently, there is no known research investigating the use of ACT with troubled S-TD

However, given the empirical research supporting the use of ACT with children, there is reason to suspect that ACT could be successful treating this population.

ACT can help S-TD develop skills for approaching internal and external barriers with resilience

Our study

- The current study aimed to strengthen *S-TD* / *S-ASD* relationships
- Ultimately, we aimed to make meaningful changes to the overall family system, so that everyone could benefit from the services we provided.
- The treatment package was Behavioral Skill Training (BST) plus ACT
- Throughout the study we only pinpointed socially significant, observable, and measurable behavior associated with healthy sibling relationships. We assessed the success of the intervention by using a multiple probe baseline design.

DARE to Connect

Pinpointed and measured socially significant behavior associated with healthy sibling relationships

Assisted children to learn and apply four skills, easily remembered in the acronym DARE to Connect

These skills aimed to alter the functions of private events and subsequently affect overt behavior (e.g., building closer relationships).

Defuse

Observe the rules and change

Accept

Approach difficult memories & emotions

Re-center

Notice what you are attending to and how you are seeing yourself & others

Engage

Identify what matters, set goals, & manipulate variables that lead to their attainment

Method

Experimental Design

- Multiple Probe Across Participants Design

DVs:

- *Rate per Minute* of aversive behavior
- *Duration* of appetitive interactions with one another

IV:

- ACT+BST (*DARE to Connect* Program)

Inclusion Criteria

- S-TD aged 13-17 yrs.
- Regularly engage in escalating interactions such as verbal/physical aggression.

Participants

	Caregiver Report	Direct Observation	Self-Report
Charley (13 yrs.)	-Avoidance -Verbal Aggression -Physical Aggression -Tension in the family -Existed for 6 months	-Rejected play 87% of times asked. -Verbal Agg/RPM 0.26x per interaction (4x in 15) -Inappropriately terminated interaction 100%	-Expressed he did not enjoy interacting with his brother. -Expressed concerns getting blamed, unfairness, and lack of play skills
Andy (15 yrs.)	- Verbal Aggression - Teasing -Physical encounter from both siblings. -Existed for over 24 months	-Rejected play 75% of the times asked. -Verbal Agg/RPM 0.45x per interaction (9x/20 min) -Inappropriately terminated interaction 100%	-Expressed he did not enjoy interacting with his brother. -Concerns with outburst and tantrums

Treatment *DARE+BST*

Treatment Procedure

- 6-hour workshop
  - Facilitated by an ACT peer reviewed trainer
- Activities *physicalized* psychological flexibility skills

Treatment *DARE+BST*

- **Defuse**
  - Rock, Scissors, Paper
  - I have a secret
  - What are the rules when you have a sibling with special needs
    - Say them angrily, loudly, funnily, then quietly
- **Accept**
  - Push feelings away versus letting them sit on your lap
  - Human knot
- **Re-center**
  - Sherpa Walk
  - Smaug's Jewels
- **Engage**
  - Falling Into Friendship
  - List what you'll do, when you'll do it, who you'll report to, what you'll earn, who'll give your earnings to you

Treatment Integrity

- Evaluated the implementation of six processes ACT
- A second trained observer evaluated the concepts being delivered by the first
- Additional assessing was conducted by reviewing the pre-recorded videos of the workshop
- Treatment Integrity equaled 100%, scored for 83% of the workshop

Appendix C

Treatment Integrity

Acceptance – • Trainer encouraged participants to notice bodily sensations without trying to control them, minimize them, or eliminate them • Trainer modeled willingness to feel a range of both appetitive and aversive emotions • Trainer used activities and metaphors to help generate participant willingness to experience their emotions, bodily sensations, or memories	# of times acceptance training or modeling was observed
Defusion – • Trainer encouraged participants to observe their thoughts and rules without trying to suppress or judge them • Trainer used experiential exercises and metaphors to create a sense of curiosity or play with respect to unwanted or intrusive or scary thoughts	# of times defusion training or modeling was observed
Flexible perspective-taking– • Trainer gives participants opportunities to see themselves in different ways • Trainer uses exercises and metaphors to encourage seeing others and self from different "angles" • Trainer models being able to take others' perspective and try on different perspectives of himself	# of times flexible perspective-taking was modeled or encouraged
Present moment awareness– • Trainer practices in the here-and-now, without judgment or fixation on the past. • Trainer uses exercises to expand the client's sense of experience as an ongoing process. • Trainer models coming back to the present moment	# of times present moment awareness was modeled or encouraged in an exercise
Valuing– • Trainer created opportunities for participants to identify what they cared about • Trainer modeled saying what he cared the most about	# of times valuing was encouraged or modeled
Committed Action– • Trainer helped participants identify antecedent and consequent variables that promoted and get in the way of optimal behavior • Trainer helped participants identify strategies to work through barriers to optimal behavior • Trainer facilitated discussion of commitments with respect to important life domains • Trainer modeled contingency management and verbal commitment to valued action	# of times trainer modeled or promoted participants' arrangement of contingencies and verbal commitment to valued actions

Data Collection and IOA

Data Collection Method

- Continuous measures e.g., event recording which was converted to rate per minute, and duration.
- Behavior of the participants were plotted on a linear graph and visually inspected to determine whether they needed further intervening.

Interobserver Agreement

Method	%	Across
Mean Reliability-Total Duration	98%	70% all Tx sessions
Mean Reliability-Total Count	100%	70% all Tx sessions
Exact Count-Per-Interval IOA	100%	3 pre-recorded scenes

Social Validity of the Method

Utilizing a Likert-type scale completed by the caregivers from 1 to 5 with higher scores indicating a more favorable impression:
M=26.5; range 25-28

Appendix E

Acceptability of Method

Directions: Please read each statement and then circle one of five of the choices that best describe the extent to which you agree or disagree with each of the statements below.

Participant ID#: _____

1. I find this treatment to be an acceptable way of dealing with the child's problem behavior	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree
2. I find this treatment to be an acceptable way of dealing with the child's problem behavior.	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree
3. I would be willing to use this procedure if I had to change the child's problem behavior.	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree
4. I like the procedures used in this treatment	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree
5. I do not believe the child will experience discomfort during the treatment.	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree
6. I believe it would be acceptable to use this treatment with individuals who cannot choose treatments for themselves.	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

Social Validity of the Outcomes

At one-month post treatment by asking other clinical professional to compare the interactions to those siblings with healthy relationships via video clips by utilizing a Likert-type scale from 1 to 5, with higher scores indicating a more favorable impression.

Results: indicated that each dyad scored within the **range of 4-5** in each question, implying that our participants were interacting with one another at typical levels compared to other siblings.

Appendix D

Social Validity of Results Questionnaire

Directions: Please view this short video and then circle one of five of the choices that best describe the extent to which you agree or disagree with each of the statements below.

Video Clip #_____ **Participant ID#:** _____

1. The pair of children appear to be cooperating with one another.	(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree
2. The pair of children do not appear to try to out-do or beat each other in the activities they are engaging.	(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree
3. The pair of children appear to be in agreement with the rules of the games.	(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree
4. The pair of children appear to be enjoying their interaction with one another during the activities.	(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree
5. It appears that both children are equally contributing to the activities.	(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree
6. It appears that the pair of children are having fun with each other.	(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

An ACT Contingency Planning Worksheet

What do I care most about?	What am I willing to aim for that fits with the things I care about?	Exactly what will I do?	What obstacles could get in my way?	What DARE skills will I use to get through the obstacles?	When will I get this done?	What will I earn?
My family	Play with my little brother	I'll play video games with my brother for ½ hour after we both get homework done on M, Th, and F	He has to do everything his way and my parents let him so that he doesn't destroy things I get angry and don't want to share my toys with him	*Defusion*: 1. "You have to!!!.." (laugh!) 2. Ninjas walk away *Acceptance:* 1. It's ok to feel angry! 2. What else am I feeling right now?	Play vids w/ my brother M, Th, & F Use "Ninjas walk away" the next time he's demanding Use "labeling what I feel" the next time I feel upset	Dad will take me to see the new Star Wars movie on the weekend Mom will hang out with my brother when I want my friends to come over

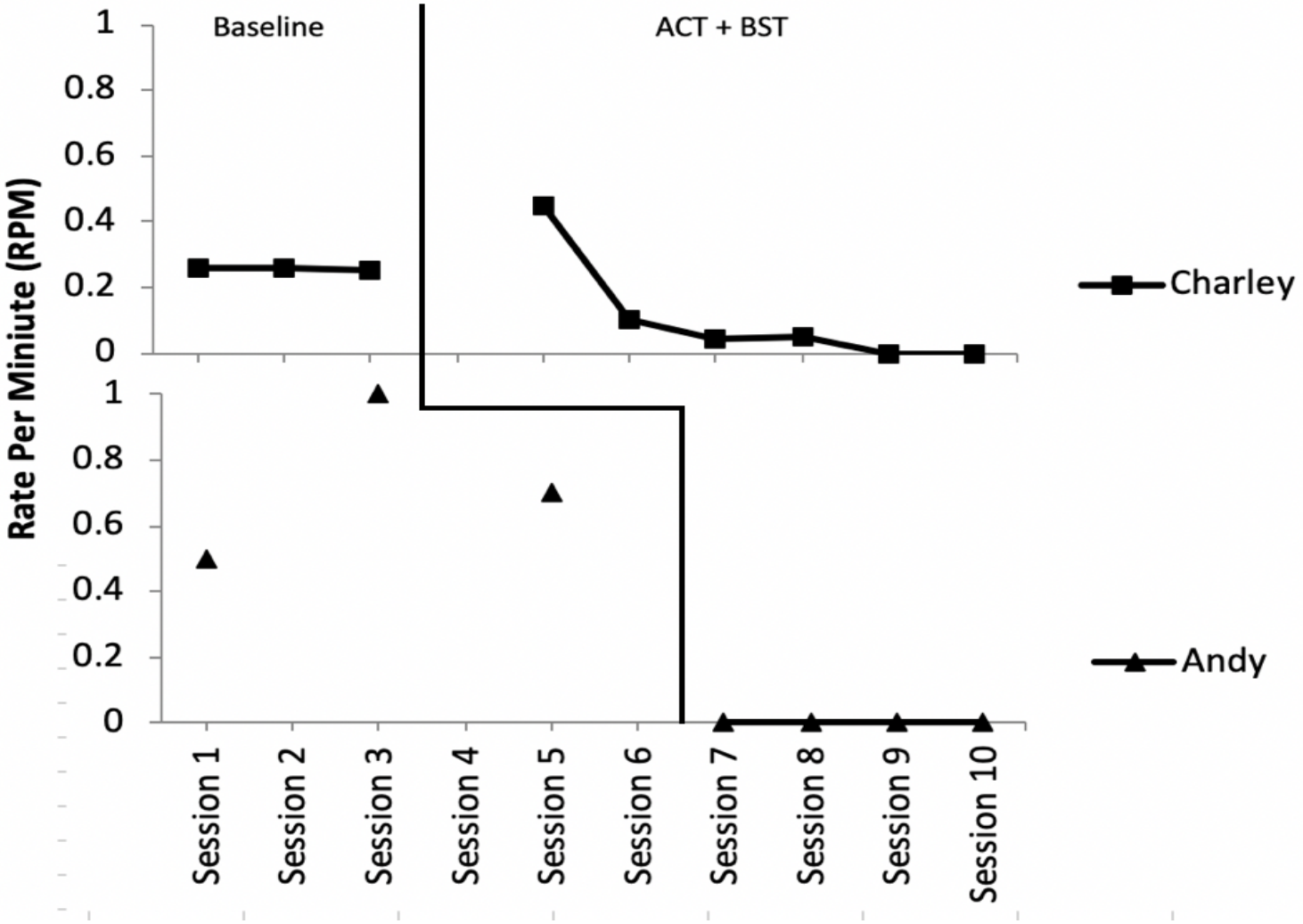


Figure 1. The above figure represents the rate per minute of problem behavior that is displayed by the participant's Charley (top panel) and Andy (lower panel). At baseline Charley demonstrated problem behavior (M= 0.26 rpm; range 0.25-0.26 rpm). After exposure of ACT and BST, Charley's behavior reduced (M= 0.10 rpm; range 0.0-0.45). At baseline Andy demonstrated problem behavior (M=0.56 rpm; range 0.5-0.70). After exposure of ACT and BST, Charley's behavior reduced (M=0.0 rpm; range 0.0-0.0)

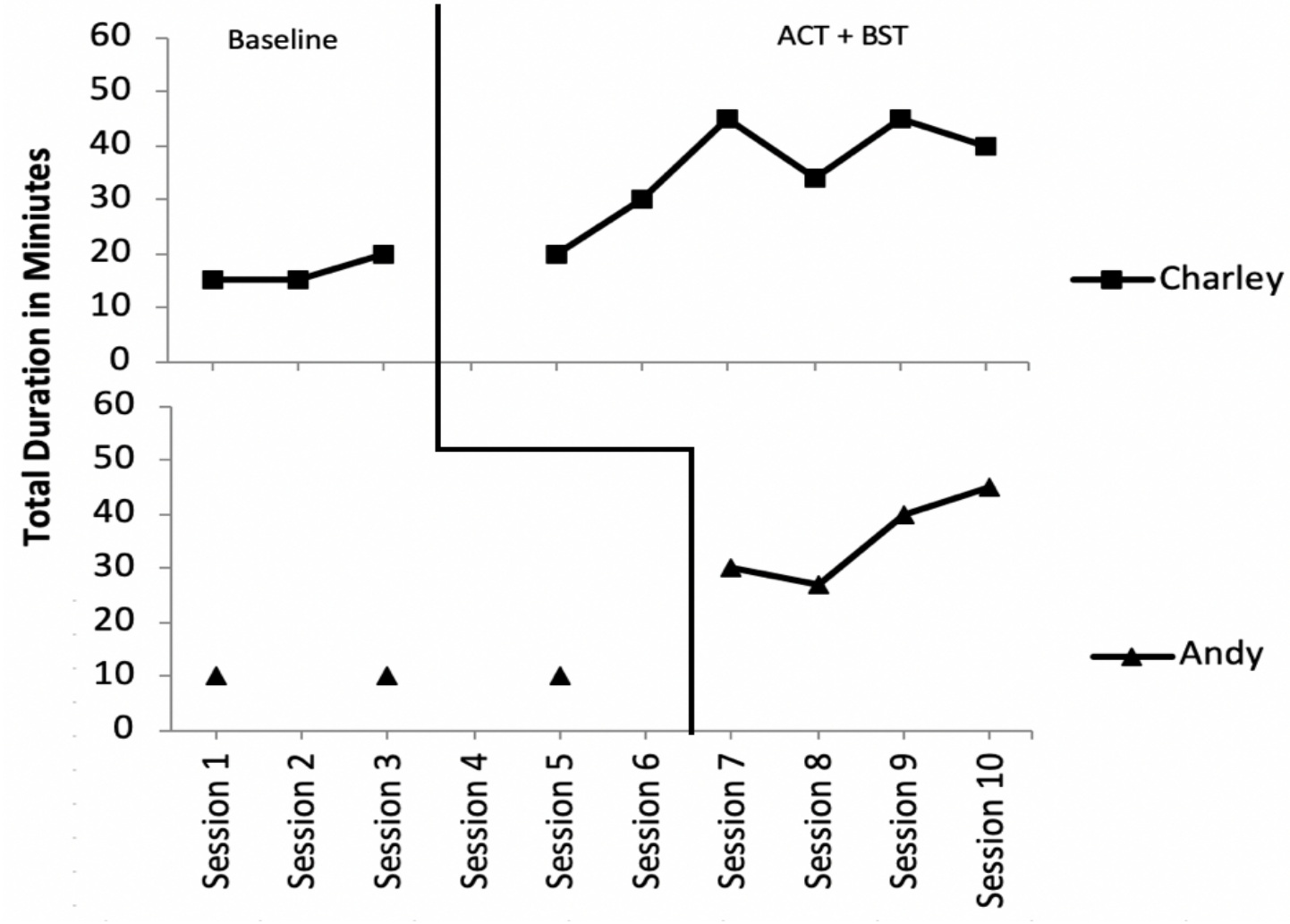


Figure 2. The above figure represents total duration in minutes of sibling interaction displayed by the participant's Charley (top panel) and Andy (lower panel). At baseline Charley demonstrated low levels of sibling interaction (M= 16 minutes; range 15-20 minutes). After exposure of ACT and BST, Charley's sibling interaction increased (M= 35 minutes; range 20-45 minutes). At baseline Andy demonstrated low levels of sibling interaction (M=10 minutes; range 10-10). After exposure of ACT and BST, Charley's behavior increased (M=35 minutes; range 27-45 minutes).

Discussion

- Although some conflict is normal and even constructive, prolonged forms of sibling conflict prevalent in S-TD/S-ASD dyads are linked to increased risk of school dropout, substance abuse, and other difficulties

- DARE to Connect reduced aversive behavior and increased positive sibling interactions by exposing kids to activities in which they approached their most dreaded private content

- Outcomes at 1-month post treatment comparing to those of siblings with healthy relationships indicated that each experiment dyad was interacting with one another at typical levels

Future Research

- Whole-family interventions could be investigated
- Generalization across settings and long-term maintenance should be addressed

A Special Thank You and Appreciation !

- To the families and children who allowed us to work with them
- Giving us the opportunity present these finding
- To the team of professionals at this presentation who continuously striving to bring positive into our communities and across the world

Freddie Arciniega
Tom Szabo
Jonathan Tarbox

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