

Moving from Disruption to Learning: Pre-K Children Learn to Self-regulate with Multi-sensory Instructional Approach

Heidi Johnecheck¹, Linda Bruene², Ella Greenberg³

¹Ripple Effects, Inc., ²Rutgers Behavioral Health Care (retired), ³Whitman College
Poster presented at the National Association for the Education of Young Children Conference - November 2023

Abstract

Research indicates that children who exhibit disruptive behaviors experience greater barriers to school success. Stressors, acute and chronic, have been shown to affect early learners' attention, memory and learning. The ability to self-regulate is an essential step for a child to access an optimal learning state and readiness for school. A series of pilot studies were conducted to evaluate impacts of a technology-enabled, multi-sensory intervention called *Bouncy's Ready to Learn Resilience* program, on early learners' classroom-based, disruptive behavior. Following a minimum of 8 weeks of intervention, teachers reported that children who had been chronically disruptive: developed self-regulation skills; showed reductions in chronic disruptive behavior; and used "Bouncy Breathing" to self-soothe when stressed.

Background

Chronic, emotional dysregulation results in disruptive behaviors that interfere with individual and group learning, decreasing instructional time. Acute and chronic stressors have the potential to inhibit learning and exacerbate dysregulation. Children who have positive, secure relationships ("secure attachments") are better able to cope with chronic stressors and manage their feelings. When caregivers soothe a child, it positively impacts the child's breath rate, stabilizing the autonomic nervous system to a more optimal balance that is needed to feel safe enough to engage in exploration and learning. Learning to control their own breath rate is something children can do to help them better manage emotions, pay attention and learn.

Bouncy's Ready to Learn Resilience program is anchored by *Breathing Bouncy*, an animatronic plush service dog. Bouncy's play-based, character-driven and multi-sensory approach, offers young children a secure relationship, systematic self-regulation skill training, and provides "just in time" support for managing their emotional dysregulation when stressed. *Breathing Bouncy*, is programmed to model a pediatric breath rate linked to an optimal range for learning. Bouncy songs, books, apps and more provide additional activities for skill training, coaching and encouragement.

Can a multi-sensory approach that centers a tech-enabled service dog as a source of emotional support and a model and facilitator of self-regulation training, have a positive impact on disruptive behavior among pre-K students? Can children transfer new self-regulation skills in real time to emotionally dysregulated situations?

Methods

Single subject design, with mixed methods, involved 13 pre-K students from 6 classrooms, across 2 schools. 11 from a working-class suburb, and 2 from a low SES, rural community. Two students identified as ELL. All except 3 students had a special education classification; all exhibited chronic disruptive behaviors. In all cases, "Bouncy Breathing" was introduced and practiced daily with the whole class. Students cared for *Breathing Bouncy*, and Bouncy was developed as a character through storybooks, coloring books, music and dance videos. Opportunities were provided for students to self-direct use of Bouncy for self-soothing and breath practice when upset. Before and after exposure to Bouncy, teachers participated in researcher interviews and completed observational surveys about their students' self-regulation skills (breath regulation) and disruptive behavior (frequency, duration and intensity).

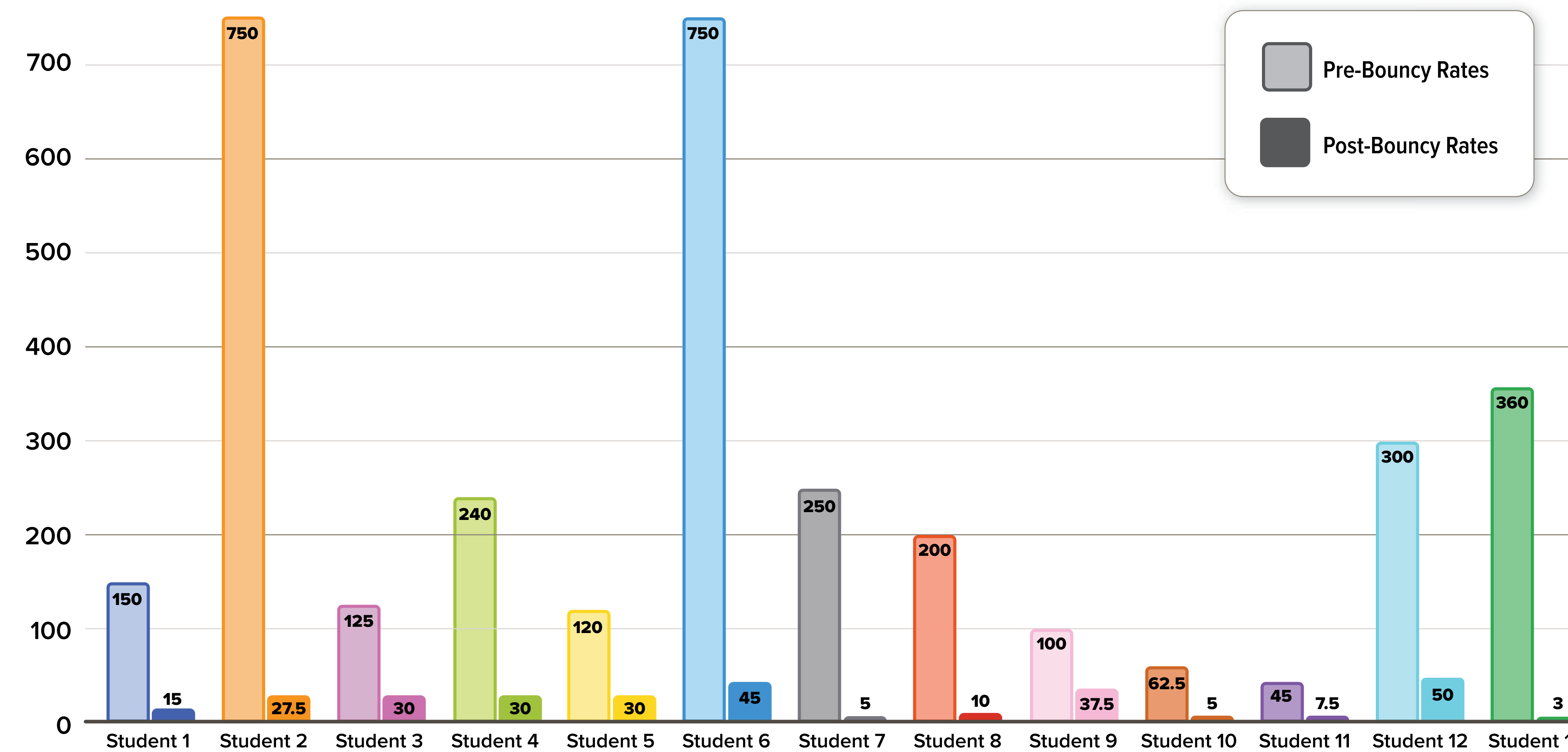
Results

From pre- to post- intervention:

1. Students demonstrated development of self-regulation skills
2. Students used "Bouncy Breathing" to self-soothe when stressed
3. Teachers reported substantial reductions in chronic disruptive behavior.



Disruptive Behavior Amount (minutes/week)



Student 4 - Female, Age 4, White, "Attachment Disorder"
Target Behavior: Behaviors related to social anxiety and parent separation
Reduction in Target Behavior: 87%
Teacher Comments: "Child had separation anxiety when separating from her mom and brother. Child would ask for Bouncy and then calmed down as soon as we would sing and do breathing techniques with her."

Student 5 - Male, Age 4, White, Apraxia and Social Anxiety
Target Behavior: Behaviors related to social anxiety
Reduction in Target Behavior: 75%
Teacher Comments: "When he starts feeling anxious he will grab Bouncy to calm down...has even told others that had not met Bouncy what he does. This is from a child who has severe social anxiety."

Student 6 - Male, Age 5, White, ASD and Marfan Syndrome
Target Behavior: Tantrum behaviors
Reduction in Target Behavior: 94%
Teacher Comments: "We used Bouncy to encourage Student 6 to engage in pretend play with others, a difficult skill for a child on the spectrum." "He would not hold Bouncy but if you watch he is mimicking the breathing..."

Student 7 - Female, Age 4, Black, Developmental Delay
Target Behavior: Disruptive behaviors
Reduction in Target Behavior: 99%
Teacher Comments: "She also was able to stay engaged without the need to turn Bouncy on. Just his presence and being able to have him in her lap was enough support."

Student 8 - Male, Age 5, African American, Developmental Delay, Speech/Language Delay, ELL
Target Behavior: Disengaged, Emotional Outbursts
Reduction in Target Behavior: 99%
Teacher Comments: "Student 8 had a fun time getting to know Bouncy and being able to notice his breathing with him as he learned what it means to be strong and calm. Used the vocabulary "I am strong" or "I am calm" when practicing independently during centers."

Student 9 - Female, Age 4, Hispanic, Developmental Delay, ASD
Target Behavior: Emotional outbursts, including crying and running away
Reduction in Target Behavior: 63%
Teacher Comments: Teacher reports at end of intervention period: "In 3 out of 5 monitored attempts, Student 9 has been able to self calm with the use of Bouncy without adult prompting or the use of a visual."

Student 10 - Female, Age 5, Latina, ELL
Target Behavior: Defiant behaviors associated with classroom rules and transitions
Reduction in Target Behavior: 92%
Teacher Comments: "Used breathing techniques with Bouncy...When student would be upset she would ask for Bouncy and hold him."

Student 11 - Female, Age 5, Asian, Other Health Impaired/Developmental Delay
Target Behavior: Disruptive behaviors (crying and whining) when upset
Reduction in Target Behavior: 83%
Teacher Comments: "Use as a reward to earn time to take care of Bouncy. Motivated by indiv. grooming time... Sometimes child upset - remind her of "Bouncy Breathing."

Student 12 - Female, Age 4, Hispanic
Target Behavior: Peer interactions - bullying, arguing, not sharing
Reduction in Target Behavior: 83%
Teacher Comments: "Now using more calm down strategies to talk with teachers on how to have more positive interactions with friends...Taking calm down breaks with breathing techniques."

Student 13 - Female, Age 5, African-American
Target Behavior: Meltdown behaviors (crying, screaming, kicking, yelling)
Reduction in Target Behavior: 99%
Teacher Comments: "We had child hold Bouncy and calm down and breathe." At end of intervention period, teacher reports intensity of behavior decreasing from 5 (extremely intense) to 1 (mildest).

Conclusions

Strong early results indicate Bouncy can be an effective skill-building tool and emotional support to help reduce disruptive behaviors for pre-K students who exhibit chronic, disruptive behaviors. Replication studies are underway to further substantiate a causal link between the intervention and outcomes. Given the potential of scalable, life-altering positive impacts on children, more research is clearly warranted.