

# Immersive Virtual Reality and Optimism Training to Enhance Behavioral Parent Training for ADHD



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### INTRO

This study aimed to enhance behavioral parent training (BPT) outcomes through the use of immersive virtual reality (IVR) and optimism training. Specific goals included improving parental strategy implementation frequency and accuracy, increasing the maintenance over time and generalization of skills across settings, and reducing children's ADHD related symptoms. It was hypothesized that participation in the naturalistic IVR scenarios would increase opportunities for parents to practice behavior management strategies introduced in the BPT sessions, promoting the maintenance and generalization of treatment effects. It was also hypothesized that helping parents recognize and reframe their pessimistic thinking through optimism training would increase participant's optimism about their parenting behavior and their child's behavior.

### METHODS

- 10 parents of 3-5 years old children at-risk for ADHD were recruited in Eastern Pennsylvania and completed 10 BPT and optimism training sessions and 4 IVR experiences.
- Parent ratings assessed changes in child problem behavior (Conners-early childhood: Global Index Total, Inattention/hyperactivity, Defiance/Aggression, parenting stress (Parenting Stress Index-4), parenting competence, and parenting optimism (Parental Attribution Measure, Questionnaire on Resources and Stress- Pessimism Subscale, Family Empowerment Scale- Competence Subscale) at pre- and post-intervention.
- Parent social validity and satisfaction ratings were collected post-intervention (TARF-R).
- Post-treatment parent focus groups yielded qualitative data.

### RESULTS

Outcome	Measure	Pre- Mean and Range	Post-Mean And Range	Paired Samples t-test (p value)	Effect Size (Cohen's d)
Child behavior (N=8)	Conners- GI Total (T-score)	72.63 (SD=8.45) 57-87	69.25 (SD=8.71) 53-79	.270	.43
	Conners- IH (T-score)	75.00 (SD=6.12) 64-81	69.88 (SD=9.92) 50-83	.05*	.81
	Conners- DA (T-score)	74.625 (SD=15.17) 51-90	73.12 (SD=15.39) 52-90	.735	0.125
Parenting Optimism (N=7)	QRS Pessimism Subscale	2.57 (SD=2.94) 0-8	1.43 (SD=2.15) 0-6	.139	.64
	PAM total score (N=8)	9.25 (SD=2.252) 6-13	4.5 (SD=3.7) 0-12	.004**	1.51
	FES Competence Subscale (N=8)	31.63 (SD=3.54) 26-38	35.13 (SD=3.73) 28-39	.018*	1.09
Parenting Stress (N=8)	PSI	88.13 (SD=27.76) 63-132	83.13 (SD=21.047) 57-114	.486	.26
Treatment Acceptability (N=9)	TARF- Total Acceptability (average item score; 1-7)	..	5.90 4.35-6.82 (SD=0.74)	..	..

Note: \* ≤ .05; \*\* ≤ .01

The enhanced BPT program decreased parental pessimism regarding their children's behavior and their own parenting, increased parenting competence, decreased parenting stress, improved child behavior, and was viewed as a highly acceptable treatment.



### Focus Group: Qualitative Themes

- The addition of optimism training to BPT meaningfully enhanced parent and child outcomes.
- The IVR experience offered a promising avenue for the opportunity to practice skills.
- The IVR experience would have benefitted from:
  - More complex and challenging scenarios.
  - Scenarios including sibling conflict and managing multiple children at once.
  - Scenarios with various target behaviors beyond tantrums.

### Discussion

- The enhanced BPT resulted in improved child behavior, lower parental pessimism, lower parenting stress, increased parent competence, and high treatment satisfaction.
- Limitations:
  - This study included a small sample size and thus has limited statistical power. Consequently, the lack of statistical significance for the QRS and PSI could be due to not having enough power to detect meaningful change.
  - The study did not include a control condition.
- Future research should continue to evaluate the positive impact of optimism training as an additive component to traditional BPT.
- Future research should examine the use of IVR to help parents practice BPT skills in the moment, including higher intensity problem behaviors with more complex solutions.
- Note: COVID-19 impacted the use of IVR and some of the scenarios were altered to desktop experiences. Face to Face parenting sessions also took place on a video conferencing platform.