

## ONLINE SUPPLEMENT

### DESCRIPTION OF TREATMENT

#### **Standard Behavior Therapy**

Generally, rewards and punishments were used in a balanced manner during SBT, which consisted of a standard implementation of the empirically supported Summer Treatment Program (STP) for children with disruptive behavior problems (see Pelham et al., 2017; Pelham, Greiner, & Gnagy, 1998 for details). Children earned points for positive behaviors and lost points for negative behaviors. The point system was backed up with daily and weekly rewards (e.g., free time, field trips, food treats) for positive behavior and daily and weekly punishments (e.g., chores, writing sentences) for negative behavior. Serious misbehavior (intentional aggression, intentional destruction of property, repeated non-compliance) resulted in Time Out that was initially 10 minutes but escalated up to 20 minutes as a punishment for disruptive behavior while in Time Out. A social skills program was provided each morning for 15 minutes, which included a discussion of the social skill of the day to define the topic, role play by counselors to model the skill, role play by children to practice the skill, and discussion to generalize the skill to treatment and natural settings.

#### **Modified Behavior Therapy**

During MBT, rewards were emphasized and punishments de-emphasized using procedures developed through pilot research (Miller et al., 2014). MBT was also implemented in an STP context but standard treatment procedures typically used in the STP were changed as follows. First, children earned points for positive behaviors but did not lose points for negative behaviors. Instead, negative behaviors were recorded but there was no point loss attached to them.

Second, the point system was backed up with daily and weekly rewards for treatment progress, but there was no daily or weekly punishment for lack of treatment progress. Likewise, serious

misbehavior (intentional aggression, intentional destruction of property, repeated noncompliance) resulted in Time Out that was initially 10 minutes (as in SBT), but children's behavior during Time Out was managed by an incentive rather than cost system. That is, the absence of misbehavior during Time Out resulted in decreasing the length of Time Out from 10 to 5 minutes, but the length of Time Out did not increase due to misbehavior.

Third, extra rewards (toys and privileges) were implemented using a ticket system that complemented the ongoing point system. The rationale for this procedure was to increase the frequency, salience, and immediacy of rewards provided to children. Tickets were earned by avoiding rule violations (i.e., the absence of negative behavior was rewarded by giving children tickets) and through a "caught you being good" system in which counselors provided tickets spontaneously when children were showing positive or non-negative behaviors. Counselors were trained to provide at least one "caught you being good" ticket in the morning and another in the afternoon, but they could award as many others as they chose. Counselors were also encouraged to award children a "caught you being good" ticket within the first 15 minutes of the child's arrival to treatment each morning as a means of orienting the child toward positive, non-negative behavior and toward earning rewards. Tickets were traded in for prizes and toys that ranged in size and value. Children were provided the opportunity to trade tickets for prizes at the end of each day and children were frequently shown the possible toys and prizes they could earn to motivate them to keep earning tickets. Children earned an average of 5.77 tickets per day ( $SD = 2.45$ ).

Fourth, children had the opportunity to earn a special activity at the end of each day, contingent on positive group behavior. The rationale behind this procedure was to increase the rewards available to children as well as to provide a means of controlling behaviors that were problematic in pilot research (described below). When earned, this special activity replaced the third sport activity that is typically used in the STP. Activities were chosen by children at the start of each day and typical examples included dodge ball and capture the flag. Each treatment group earned the special activity if they had X or fewer instances of leaving the group without permission, where X was determined by drawing a number out of a hat just before the activity was to occur. This target behavior (leaving the group without permission) was

chosen based on pilot work showing it was especially problematic for this population (e.g., children would covertly arrange for all 12 group members to run in a different direction as a means of disrupting the ongoing activity and upsetting their counselors). Likewise a lottery was used to determine the target criterion number, rather than fixing it ahead of time, because pilot research showed that when children were aware of the specific target number their behavior would dramatically decline as soon as it became apparent that they would not earn the specially activity privilege (Waschbusch et al., 2016). When children did not earn the special activity they instead played one of the standard sports used in the STP (baseball, basketball, or soccer).

Fifth, counselors were instructed to have multiple daily check-ins with each child. The rationale for this procedure was to encourage the child to develop a positive relationship with counselors, which arguably would be perceived as rewarding to the child. Counselors were trained to check in with children at least twice per day (once in the morning, once in the afternoon) during times that did not interfere with ongoing activities (e.g., at arrival, during transitions, etc.), but they could check in more often when feasible. Counselors were provided a list of questions to prompt conversations, such as “how are you feeling today?”, “what good or bad things have happened to you today?”, and “is there anything you are angry about today?” , but counselors were allowed to select which questions to ask at any given check-in. Counselors averaged 2.01 check-ins per day per child ( $SD = 0.91$ ).

Sixth, children were given the option to take voluntary five minute breaks from any activity up to three times per day. The rationale for this procedure was to enhance children’s sense of control over their environment and provide them a temporary reprieve from any undesired state they were experiencing, thereby making the treatment environment more rewarding. Children were given “sit out” cards that they could use up to three times a day at any time of their choosing, with each card providing a five minute break from the ongoing activity. Children were encouraged to use sit outs when they needed a break for physical (e.g., tired) or emotional (e.g., frustrated) reasons. Children averaged 1.23 sit outs per day ( $SD = 1.11$ ).

Finally emotion skills training was used in place of the social skills training. The rationale for this change was to provide children with tools to help them become aware of and exert control over their emotions because these skills impact the experience of earning rewards or being assigned punishment. The content was designed by the investigators and was intended to teach children about their own and others emotions. Emotion training modules lasted 15 minutes and followed the same structure used to teach the social skills module (i.e., define the skill, role play by counselors, role play by children, discussion to generalize the skill). Just as with other treatment fidelity evaluations, fidelity of the emotion modules was assessed by having supervisors observe the delivery of the emotion modules and evaluate whether material was delivered as intended using Likert scales that ranged from 1 (“high quality”) to 7 (“low quality”). The average quality of implementation for the emotion modules was 2.74 ( $SD = 2.22$ ).

## CORRELATIONS AMONG MEASURES

### *Bivariate correlations between independent measures*

	CU	CP	ADHD
CU	--		
CP	.54**	--	
ADHD	.35*	.27	--
Medication	.03	.04	-.16

*Notes:* CU, CP, and ADHD rated by both parents and teachers and combined by taking the max scores item-by-item. Medication coded 0 = no medication, 1 = medication. ADHD = attention-deficit hyperactivity disorder, defined as the average rating on ADHD symptoms on the DBDRS (Pelham, Gnagy, Greenslade, & Milich, 1992). CP = conduct problem, defined as the average rating on ODD and CD symptoms on the DBDRS (Pelham et al., 1992). CU = callous-unemotional, defined as the ICU total score (Frick, 2004). \* =  $p < .05$ .

*Bivariate correlations between dependent measures*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Point System <sup>a</sup>															
1. Noncompliance	--														
2. Rule Violations	.91*	--													
3. Interruptions	.69*	.75*	--												
4. Complaining	.79*	.78*	.60*	--											
5. Conduct Problems	.84*	.87*	.72*	.78*	--										
6. Negative Verbal	.82*	.79*	.78*	.79*	.86*	--									
7. Positive Peer Behavior	.22	.25	.31*	.12	.24	.32	--								
Weekly Ratings															
8. Inatt-Impulse-Overact <sup>b</sup>	.23	.12	-.03	.18	.06	.06	-.21	--							
9. Oppositional-Defiant <sup>b</sup>	.11	-.06	-.14	.21	-.03	.05	-.40*	.58*	--						
10. Problem Ratings <sup>c</sup>	.05	-.10	-.16	.12	-.13	.03	-.25	.75*	.75*	--					
End of Treatment Ratings															
11. Callous-Unemot <sup>d</sup>	-.22	-.28	-.35*	-.23	-.24	-.31*	-.34*	.50*	.43*	.52*	--				
12. Conduct Problems	-.04	-.14	-.23	.02	-.18	-.08	-.17	.31*	.58*	.66*	.59*	--			
13. ADHD	-.03	-.09	-.13	-.11	-.13	-.13	-.17	.60*	.44*	.58*	.55*	.40*	--		
14. Impairment <sup>f</sup>	-.10	-.16	-.25	-.15	-.12	-.23	-.27	.31*	.43*	.51*	.57*	.64*	.50*	--	
15. Improvement <sup>g</sup>	-.06	.07	.13	-.02	.10	.05	.23	-.65*	-.72*	-.76*	-.47*	-.47*	-.47*	-.45*	--
16. Treatment Satisfact <sup>h</sup>	.02	.17	.28	-.02	.16	.14	.44*	-.47*	-.58*	-.48*	-.40*	-.31*	-.19	-.33*	.47**

*Notes:* Weekly ratings and end of treatment ratings completed by parents. a = point system categories as defined in the Summer Treatment Program manual (Pelham et al., 1998). b = inattentive-impulsive-overactive and oppositional-defiant scores from the IOWA Conners (Waschbusch & Willoughby, 2008). c = average score on the Problem Rating Form (Waschbusch, Coles, & Pelham 2013). d = total score on the Inventory of Callous-Unemotional Traits (Frick, 2004); e = Symptom counts from the Disruptive Behavior Disorders Rating Scale (Pelham et al., 1992); f = average on the Impairment Rating Scale (Fabiano et al., 2006); g = average score on the Improvement Rating Scale (Pelham et al., 2000). h = items from the Parent Treatment Satisfaction Ratings (Pelham et al., 2000). \* =  $p < .05$ .

*Bivariate correlations between independent and dependent measures*

Dependent Variables	Independent Variables			
	CU	CP	ADHD	Medication
<b>Point System<sup>a</sup></b>				
Noncompliance	-.12	.19	.01	.18
Rule Violations	-.10	.20	.10	.04
Interruptions	-.16	.10	.14	-.05
Complaining	-.09	.28	.02	.12
Conduct Problems	.06	.30*	.07	.17
Negative Verbalizations	-.07	.24	.01	.04
Positive Peer Behaviors	.00	.07	.07	-.10
<b>Weekly Ratings</b>				
Inattentive-Impulsive-Overactive <sup>b</sup>	.13	.00	.33*	.15
Oppositional-Defiant <sup>b</sup>	.06	.13	.03	.21
Problem Ratings <sup>c</sup>	.17	.22	.16	.11
<b>End of Treatment Ratings</b>				
Callous-Unemotional <sup>d</sup>	.60**	.19	.24	.13
Conduct Problems	.37*	.50*	.05	.02
ADHD	.23	.03	.61*	.04
Impairment <sup>f</sup>	.31*	.36*	.16	.11
Improvement <sup>g</sup>	-.16	-.07	-.11	-.20
Treatment Satisfaction <sup>h</sup>	-.08	.05	.21	-.19

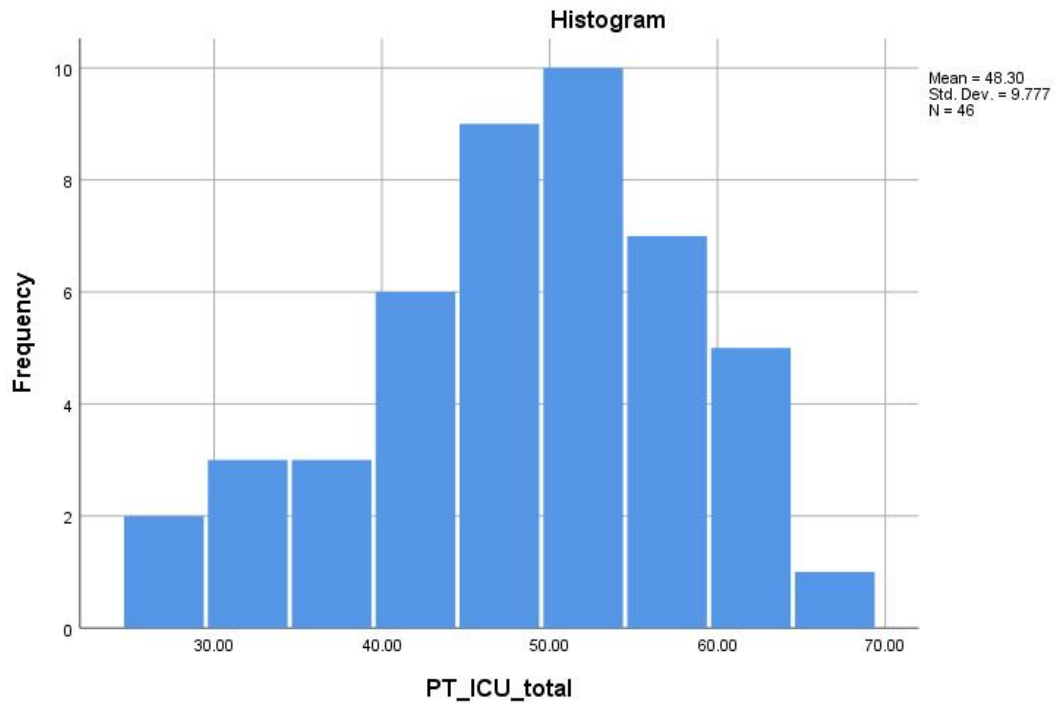
**Notes:** Medication coded 0 = no medication, 1 = medication. ADHD = attention-deficit hyperactivity

disorder, defined as the average rating on ADHD symptoms on the DBDRS (Pelham, Gnagy, Greenslade,

& Milich, 1992). CP = conduct problem, defined as the average rating on ODD and CD symptoms on the DBDRS (Pelham et al., 1992). CU = callous-unemotional, defined as the ICU total score (Frick, 2004). a = point system categories as defined in the Summer Treatment Program manual (Pelham et al., 1998). b = inattentive-impulsive-overactive and oppositional-defiant scores from the IOWA Conners (Waschbusch & Willoughby, 2008). c = average score on the Problem Rating Form (Waschbusch, Coles, & Pelham 2013). d = total score on the Inventory of Callous-Unemotional Traits (Frick, 2004); e = Symptom counts from the Disruptive Behavior Disorders Rating Scale (Pelham et al., 1992); f = average on the Impairment Rating Scale (Fabiano et al., 2006); g = average score on the Improvement Rating Scale (Pelham et al., 2000). h = items from the Parent Treatment Satisfaction Ratings (Pelham et al., 2000). \* =  $p < .05$ .



Histogram of the ICU Total Score using Parent and Teacher Combined Ratings



**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PT_ICU_total	.115	46	.154	.968	46	.231

a. Lilliefors Significance Correction

## References

- Fabiano, G. A., Pelham, W. E., Jr., Waschbusch, D. A., Gnagy, E. M., Lahey, B. B., Chronis, A. M., . . . Burrows-MacLean, L. (2006). A practical impairment measure: Psychometric properties of the Impairment Rating Scale in samples of children with attention-deficit/hyperactivity disorder and two school-based samples. *Journal of Clinical Child and Adolescent Psychology, 35*(3), 369-385. doi:10.1207/s15374424jccp3503\_3
- Frick, P. J. (2004). Inventory of Callous-Unemotional Traits. Retrieved from <http://labs.uno.edu/developmental-psychopathology/ICU.html>
- Miller, N. V., Haas, S. M., Waschbusch, D. A., Willoughby, M. T., Helseth, S. A., Crum, K. I., . . . Pelham Jr., W. E. (2014). Behavior therapy and callous-unemotional traits: Effects of a pilot study examining modified behavioral contingencies on child behavior. *Behavior Therapy, 45*(5), 606-618. doi:10.1016/j.beth.2013.10.006
- Pelham, W. E., Jr., Gnagy, E. M., Greenslade, K. E., & Milich, R. (1992). Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*(2), 210-218. doi:10.1097/00004583-199203000-00006
- Pelham, W. E., Jr., Gnagy, E. M., Greiner, A. R., Fabiano, G. A., Waschbusch, D. A., & Coles, E. K. (2017). Summer treatment programs for Attention-Deficit/Hyperactivity Disorder. In J. R. Weisz & A. E. Kazdin (Eds.), *Evidence-based psychotherapies for children and adolescents* (3rd ed., pp. 215-234). New York: Guilford Press.
- Pelham, W. E., Jr., Gnagy, E. M., Greiner, A. R., Hoza, B., Hinshaw, S. P., Swanson, J. M., . . . Baron-Mayak, C. (2000). Behavioral vs. behavioral and pharmacological treatment in

ADHD children attending a summer treatment program. *Journal of Abnormal Child Psychology*, 28(6), 507-525.

Pelham, W. E., Jr., Greiner, A. R., & Gnagy, E. M. (1998). *Children's summer day treatment program manual*. Buffalo, NY: CTADD.

Waschbusch, D. A., Bernstein, M. D., Robb Mazzant, J., Willoughby, M. T., Haas, S. M., Coles, E. K., & Pelham, W. E., Jr. (2016). A case study examining fixed versus randomized criteria for treating a child with conduct problems and callous-unemotional traits. *Evidence-Based Practice in Child and Adolescent Mental Health*, 1(2-3), 73-85.  
doi:10.1080/23794925.2016.1227946

Waschbusch, D. A., Coles, E. K., & Pelham, W. E., Jr. (2013). *Problem Rating Form*. Penn State Hershey.

Waschbusch, D. A., & Willoughby, M. T. (2008). Parent and teacher ratings on the IOWA Conners Rating Scale. *Journal of Psychopathology and Behavioral Assessment*, 30(3), 180-192. doi:10.1007/s10862-007-9064-y