

# THE IMPACT OF TREATMENT ON DEVIANCY TRAINING IN CHILDREN WITH ADHD

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## INTRODUCTION

Most of the settings in which children develop peer relations are, by definition, group settings. Because of this, most of the settings in which professionals treat difficulties in peer relations are also group settings (McFadyen-Ketchum & Dodge, 1998). Recently, however, several prominent investigators have argued against conducting interventions for peer problems in populations with disruptive behavior disorders in the context of group settings because deviancy training (DT) can occur (e.g., Dishion et al., 1999). DT is the shaping of a child's negative behavior by reinforcing attention from other children. Recommendations against aggregating disruptive children together have huge implications for children with disruptive behavior disorders given that many of these children have comorbid peer problems which may best be addressed in group settings.

Non-treatment studies of deviancy training demonstrate that in brief, unstructured, unsupervised, dyadic interactions, a high-risk adolescents will reinforce (by laughing) their peers' rule-breaking and negative statements or actions (Capaldi, Dishion, Stoolmiller, & Yoerger, 2001; Dishion, 2000; Dishion & Andrews 1995; Dishion, Eddy, Haas, Li, & Spracklen, 1997; Dishion, Poulin, & Burraston, 2001; Dishion, Spracklen, Andrews, & Patterson, 1996; Patterson, Dishion, & Yoerger, 2000; Poulin, Dishion, & Haas, 1999). Additionally, deviancy training in early adolescence is correlated with and a number of negative outcomes later in adolescence (e.g., substance use, violence, arrests, aggression towards women, and poorer friendship quality). These studies provide a strong rationale to explore the impact of treatment on DT.

To our knowledge, no studies measure DT within intensive treatment settings, none vary intensity of treatment, and none contrast these results with the level of DT in non-treatment settings. Additionally, no studies examine DT in children with behavior disorders. The current study will compare levels of deviancy training in children with behavior disorders and comparison children without behavior disorders. Further, this study will investigate whether DT occurs within group settings when minimal treatment is employed and if intensive behavioral treatment, pharmacological treatment, or the combination, is an effective deterrent to DT. We hypothesize that consistent with the adolescent literature, DT will occur in children with behavior disorders. Additionally, we predicted that behavioral treatment and pharmacological treatment will significantly decrease rates of DT across settings, with more effects being seen in higher intensity conditions.

## PARTICIPANT CHARACTERISTICS

Seventy-two children aged 5 through 12 (48 children with ADHD and 24 children without ADHD) entered the investigation. All participants were required to have a minimum full scale IQ of 80. The disruptive behavior disorders sample was required to meet DSM IV criteria for ADHD and have no documented adverse response to methylphenidate. Inclusion criteria for the comparison sample included no diagnosis of any externalizing disorder. All subjects were participants in a larger study designed to examine the relative effects of and interactions between different doses of behavioral (none, low, and high) and pharmacological (methylphenidate) treatments (placebo, .15mg/kg, .3mg/kg, and .6mg/kg) for ADHD by evaluating their separate and combined effects in a controlled summer program setting (see Pelham et al., 2003). Two boys in the ADHD group withdrew from the medication study due to concerns about medication side effects. Three children in the comparison group did not complete the study.

Table 1. Participant Characteristics.

Item	ADHD		Comparison	
	M	SD	M	SD
Age in Years	9.35	1.97	8.97	1.82
Full Scale IQ	106.97	14.31	113.57	17.35
DSM IV Items Endorsed:				
Inattention	7.88	1.67	0	0
Hyperactivity/Impulsivity	6.96	2.5	0.18	0.59
Oppositional/Defiant	4.63	2.3	0	0
Conduct Disorder	1.40	1.53	0	0

## DESIGN AND PROCEDURES

**Design:** Two within-subjects factors: medication (placebo, .15 mg/kg MPH tid, .3 mg/kg MPH tid, .6 mg MPH tid) and behavior modification (no behavior modification (NBM), low-intensity behavior modification (LBM), high-intensity behavior modification (HBM)). Medication was randomly assigned and varied daily on Mondays–Thursdays for 24 days. Behavioral treatment was varied on a triweekly basis; medication was varied daily. Children, parents, and staff members were blind to medication conditions. **Setting:** The investigation took place in the context of the summer treatment program (Pelham, Greiner, & Gnagy, 1997; Pelham & Hoza, 1996; Pelham et al., 1996).

### Behavior Modification:

HBM	LBM	NBM
Point System	Feedback	Feedback
Time Out with contingencies	Sitout (fixed length)	--
Social reinforcement	Social reinforcement	--
On-line sports training and attention questions	On-line sports training and attention questions	--
Daily report card with daily & weekly reward	Daily report card with weekly reward	--
Classroom contingency	Classroom contingency	--
Daily Recess contingency	Daily Recess contingency	--
Daily social skills	Weekly social skills	--
Problem-solving training	--	--
Honor Roll	--	--
Individualized programs	--	--

Numerous procedures were designed to insure that treatments were implemented as written. Staff members completed intensive training and memorized operational definitions for the point system categories and for deviancy training, verbalism. Weekly quizzes, point system reliability observations, Treatment Integrity and Fidelity (TIF) observations, and clinical supervisor observations were conducted throughout the nine weeks. TIF sheets contained items such as checklist procedures that counselors and teachers should follow during each of the behavioral conditions; tone of voice and performance ratings; and frequency counts of positive reinforcement, prompting, corrective feedback and instruction.

## MEASURE

**Deviancy training-reinforcer (DTR).** Counselors and teachers recorded frequency counts of deviancy training in all activities except mid-day and end of the day recess. DTR is the frequency at which a child reinforces peers for negative behaviors. Reinforcement was defined as anytime a child reacts positively to another child's rule breaking or otherwise negative behavior. A positive reaction consists of laughing, smiling, copying a behavior within 60 seconds, speaking highly of someone, cheering, clapping, or any other behavior, verbal or nonverbal, that would typically be defined as encouraging or reinforcing, and is seen or heard by the child. There were no behavioral contingencies for DTR.

Independent observers collected reliability data by watching 25% of the children in a group for an entire day and independently classifying and recording each occurrence of deviancy training. Observations were sampled across groups and days, for approximately 20% of the available observations. Reliability was determined by calculating correlations between the counselors and the observers. The mean difference was .31 (SD = 1.08) with a correlation of .90, which is acceptable.

## RESULTS

First, ADHD and comparison children were compared on DTR in an overall ANOVA. This analysis included non-medication days in the NBM condition for comparison (N = 21), ADHD only (N = 13), ADHD/ODD (N = 24), and ADHD/CD (N = 11). Second, a 3 (Behavioral treatment: NBM, LBM, HBM) x 4 (Medication treatment: placebo, .15 mg/kg, .3mg/kg, .6mg/kg) factorial ANOVA, with repeated measures on the first two factors, was performed on DTR. Significant results were followed up using simple effects comparisons. These analyses only included children with ADHD (N = 47).

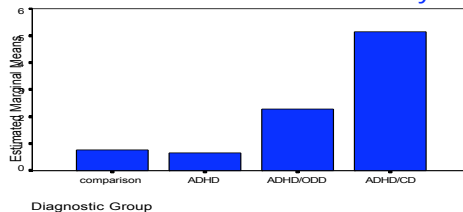
There was a significant main effect of diagnosis on DTR in the recreational setting,  $F(3, 65) = 3.47, p < .05$ . However, differences found in the classroom setting were not significant,  $F(3, 65) = 1.48, p = .23$ . In the recreational setting children with ADHD/CD reinforced their peers negative behavior significantly more than ADHD ( $p < .01$ ), ADHD/ODD ( $p < .05$ ), and comparison children ( $p < .01$ ). Notably, ADHD and ADHD/ODD children did not significantly differ from each other or from comparison children on DTR.

With the use of Wilks' criterion, DTR in the recreational setting was significantly affected by both behavioral treatment,  $F(2, 45) = 5.30, p < .01$ , and medication,  $F(3, 44) = 4.57, p < .01$ , but not their interaction,  $F(6, 41) = 1.28, p > .05$ . In the recreational setting, ADHD children reinforced more negative behavior when they were in the NBM in contrast to the LBM ( $p < .01$ ) and HBM ( $p < .01$ ) conditions. Differences between LBM and HBM were not significant ( $p = .62$ ). Additionally, ADHD children exhibited lower levels of DT on .6 mg/kg of methylphenidate in comparison to placebo ( $p < .01$ ) and .15 mg/kg ( $p < .01$ ). Differences between placebo, .15 mg/kg, and .3 mg/kg were not found to be significant ( $p > .05$ ).

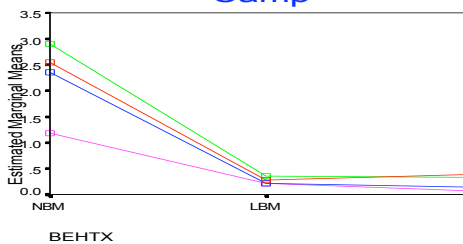
With the use of Wilks' criterion, DT in the class setting was significantly affected by behavioral treatment,  $F(2, 45) = 2.94, p < .01$ , but not by medication  $F(3, 44) = 2.35, p = .09$ , or their interaction,  $F(6, 41) = 1.75, p = .14$ . In the class, ADHD children reinforced more negative behavior when they were in NBM as opposed to LBM ( $p \leq .001$ ) or HBM ( $p < .001$ ). Differences between LBM and HBM were marginally significant ( $p = .07$ ).

### Deviancy Training (Camp)

#### NBM & Nonmedication days



### Deviancy Training Camp



## DISCUSSION

DT occurred at high levels only in the absence of effective treatment (NBM condition). This finding has significant implications for the many juvenile detention centers, group homes, and facilities that aggregate children with behavior and emotional disorders and do not implement intensive behavioral interventions.

DT occurred in both the recreational and classroom settings. This finding expands on previous studies which have assessed DT in clinic-group based interventions or dyadic interactions (e.g., Dishion & Andrews, 1995; Dishion, Poulin, & Burraston, 2001).

DT occurred most prominently in comorbid aggressive children. These results are consistent with the adolescent literature (e.g., Dishion and Andrews 1995). However, these results must be interpreted with caution due to the small sample size in the pure ADHD group. Future studies should attempt to include a larger sample size of both pure ADHD and pure CD children.

DT was almost nonexistent in the presence of behavioral treatment, either LBM or HBM. This finding highlights previous research which has demonstrated that behavioral interventions can improve some peer variables (e.g. Pelham & Bender, 1982).

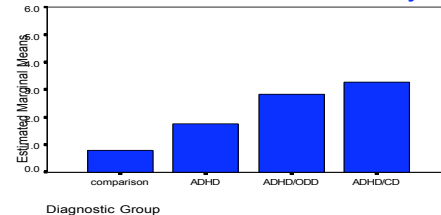
Medication reduced DT but only slightly and only at a very high dose (1.8 mg/kg/day). Additionally, in the LBM and HBM condition there was no incremental benefit of medication.

In the end, as children transition into adolescence and as independence increases adults are less able to monitor the groups that children form. Many deviant youth will ultimately affiliate with other deviant youth (Bukowski et al., 2000; Cairns et al., 1988; Snyder et al., 1997). Therefore, discontinuing group treatments will not necessarily stop high-risk children from interacting with one another or reinforcing negative behavior. Instead, group interventions that are administered by mental health professionals should also include intensive behavioral interventions to concurrently decrease negative behavior and DT. Additionally, it is imperative that behavioral interventions are applied across settings to address behavior problems and DT that might occur outside of treatment (e.g., school, home, neighborhood, group homes, and juvenile detentions centers).

This study was funded by a grant from the National Institute of Mental Health, #MH62946. For a copy of this poster send an e-mail to: aonyango@psychiatry.umsmed.edu

### Deviancy Training (Class)

#### NBM & Nonmedication Days



### Deviancy Training Class

