

HHS Public Access

J Consult Clin Psychol. Author manuscript; available in PMC 2015 August 01.

Published in final edited form as:

Author manuscript

J Consult Clin Psychol. 2015 August ; 83(4): 728-735. doi:10.1037/ccp0000030.

Evidence-Based Preventive Intervention for Preadolescent Aggressive Children: One-year Outcomes Following Randomization to Group versus Individual Delivery

John E. Lochman¹, Thomas J. Dishion², Nicole P. Powell¹, Caroline L. Boxmeyer¹, Lixin Qu¹, and Meghann Sallee¹

¹The University of Alabama

²Arizona State University, REACH Institute

Abstract

Objective—Some research suggest that group interventions with antisocial youth may on occasion have iatrogenic effects. This is the first study to test the effects of group versus individual delivery of evidence-based intervention for aggressive children.

Method—Three hundred sixty fourth-grade children were randomly assigned by school to Group Coping Power (GCP) or Individual Coping Power (ICP). Longitudinal assessments of teacher, and parent reports of behavior (BASC; PASA) were collected from baseline through a one-year follow-up.

Results—Growth curve analyses revealed children in both conditions reduced teacher and parent reported externalizing behavior problems and internalizing behavior problems by the end of the one year follow up. However, the degree of improvement in teacher-reported outcomes was significantly greater for children receiving an individual version of the program. In addition, children's baseline level of inhibitory control moderated intervention effects, showing children with low initial levels of inhibitory control to respond poorly in teacher-rated outcomes to group interventions compared to those delivered individually.

Conclusions—This study suggests overall benefits to children for either group or individual delivery of the Coping Power program under high fidelity conditions, however, for children with low levels of initial self-regulation, individualized interventions will likely yield the most significant reduction in externalizing behavior in the school setting in preadolescence.

Keywords

aggression; targeted prevention; intervention format; group intervention

Translational research over the past three decades has resulted in the development, testing and refinement of effective prevention and treatment of antisocial behavior. Despite the

⁵Since teacher-rated externalizing behavior differentially predicted attrition across the two conditions for teacher-rated outcomes, we reran the outcome analyses for the two other teacher-rated outcomes (baseline teacher-rated externalizing problems was already entered as a variable in the outcome analyses for teacher-rated externalizing behavior across time), controlling for teacher-rated externalizing behavior problems, and it did not affect the pattern of HLM findings for the other two outcomes.

success of these structured research-based interventions, some of which are delivered in a group formats, it is critical to respond to emerging scientific findings that might suggest intervention refinement. One such finding is that interventions that aggregate high-risk children into groups are potentially iatrogenic (Dodge, Dishion, & Lansford, 2006). As a result of deviant peer effects, group interventions may escalate or maintain, rather than reduce, youth behavior problems. Developmental research has indicated that children with problem behavior are likely to affiliate with each other, and that involvement with deviant peers leads to increased risk for adolescent problem behaviors. Intervention research has raised some similar concerns, although meta-analyses have not found across-the-board evidence for iatrogenic effects (Weiss et al, 2005). In a review of the literature on peer contagion in general and iatrogenic research in particular, the evidence suggested was sufficiently worrisome to lead some researchers to suggest caution when high-risk youth in clinical, educational, or correctional settings are aggregated for treatment (Dodge, Dishion & Lansford, 2006; Dishion & Tipord, 2011).

Although there are concerns about deviant peer effects in interventions for aggressive and conduct problem children, there are also may be important potential benefits to using a highly structured group format for intervention delivery (Poulin et al, 2001). The benefits include: a) potential cost-benefits of group intervention, b) more natural practice of learned skills through role-playing, c) receipt of peer reinforcement for attaining behavioral goals, and d) creation of a group norm that using non-aggressive strategies is useful.

One of the several research-based, structured group-based intervention programs for children with antisocial behavior is the Coping Power program which targets preadolescent children just prior to the additional risks they will experience during the adolescent years. Research trials have shown that randomization to the Coping Power intervention results in improvements, relative to control groups, through one-year follow-ups in substance use, delinquent behavior, and teacher-rated behavioral problems, that these intervention effects are mediated by changes in children's social cognitions and parents' use of consistent discipline, and that real-world school counselors could be trained to provide the intervention that affected children's externalizing problems according to teacher, parent and self-ratings at the end of intervention (Lochman et al., 2012a) compared to a control group. The intervention has helped to prevent the declines seen in control children in language arts grades in the two years following intervention (Lochman et al., 2012b). Long-term followup effects, three to four years after the intervention, have been found on youths' externalizing behavior in school settings in two separate studies (Lochman et al., 2013, 2014) and on substance use in a clinic setting (Zonnevylle-Bender et al., 2007). Because of the existing evidence-base for group-administered Coping Power, it provides a unique opportunity to compare the effects of group vs. individual formats with implications for structured research-based interventions for preadolescent children. Even though there are no overall negative effects of the Coping Power program, and in fact there are significant prevention effects, deviant peer group effects may be minimizing the strength of the intervention's potential effects.

In the review of potential individual moderators of group intervention effects on high risk children, it has been suggested that children's poor self-regulation might augment peer

contagion effects (Dishion & Tipsord, 2011). Inhibitory control is a key measure of children's temperamental trait to be cautious and controlling of one's personal behavior. Poor inhibition is uniquely prognostic of children's growth in problem behaviors (Pardini et al., 2004; Young et al., 2009) as well as vulnerability to peer influence (Dishion & Tipsord, 2011).

The Current Study

The current study uses the Coping Power child component as the common evidence-based intervention to compare group (GCP) versus individual (ICP) delivery, and has implications for the effects of group formats for research-based interventions for preadolescent aggressive children. It was hypothesized that ICP would produce greater reductions in externalizing behavior outcomes at a one-year follow-up in comparison to GCP. It was also hypothesized that youth with low inhibitory control would be most vulnerable to deviancy effects in the group intervention (GCP) and therefore would show smaller effect sizes than youth higher in inhibitory control at baseline, in comparison to similar children in the ICP condition.

Method

Participants

Fourth grade teachers from 20 schools completed ratings on all students in their classrooms. At the first screening gate, children whose scores fell at or above the cut-off score set at the 25th percentile were considered eligible for participation. Six students were recruited from each school for each annual cohort. At the second screening gate children whose parents rated them within the average range or above on the BASC Aggression scale remained eligible for enrollment. The three annual cohorts resulted in a total sample size of 360 parent-child pairs¹ (see Table 1 for sample information). Random assignment to condition was made at the school level. Schools were paired based on size, ethnic distribution, and eligibility for free and reduced meals. One school from each pair was randomly assigned to each condition, resulting in 10 schools in the Individual Coping Power (ICP) condition, and 10 schools in the Group Coping Power (GCP) condition. At GCP schools, each *intervention unit* of six children participated in a Coping Power group together². Overall, students participated in an average of 28.75 sessions (range = 0 to 34); GCP students participated in an average of 28.54 GCP sessions (range = 3 to 34)³.

¹Because of the screening procedure for children with moderate to high aggression, the sample had elevated externalizing behavior problems, as expected. 70.1 % of the sample had at-risk teacher-ratings for the BASC Externalizing Composite (T score greater than or equal to 60), and 36.2 % of the sample had teacher-rated BASC Externalizing Composite scores that exceeded the clinical cutoff (T score greater than or equal to 70). With regard to the parent-rated BASC Externalizing Composite, 48.3 % of the sample had at-risk scores, and 26.9 % of the sample had scores that exceeded the clinical cutoff. ²Across the three cohorts, 30 students from each condition moved to a different school during their intervention period. The mean

²Across the three cohorts, 30 students from each condition moved to a different school during their intervention period. The mean number of sessions attended for ICP students who moved was 21.73 (range = 3 to 33), and the mean number of sessions attended for GCP students who moved was 15.83 (range = 0 to 33).

³GCP children who transferred from one GCP school to another GCP school were included in the group at their new school; GCP children who transferred to an ICP school did not receive additional intervention after their move, but were still considered to be GCP children in analyses. ICP students who moved to another ICP school or to a GCP school continued to participate in Individual Coping Power sessions at their new school. Students from either condition who transferred to nonparticipating school districts did not receive additional intervention after their move.

Procedure

Preintervention (Time 1) measures were completed with children and parents at the time of enrollment, during the spring semester of students' fourth grade year. The Coping Power intervention was delivered during the end of fourth grade and throughout fifth grade. Mid-intervention assessments (Time 2) occurred in the summer after fourth grade, post-intervention assessments (Time 3) occurred in the summer after fifth grade, and one-year follow up assessments (Time 4) took place during the summer after students completed sixth grade. Children and parents were interviewed separately, typically in their homes, by research staff who were blind to the children's condition assignment. At school, baseline data (Time 1) were gathered from teachers during spring of fourth grade, post-intervention assessments were collected in the late spring of fifth grade (Time 3), and one-year follow-up data (Time 4) were collected in the spring of sixth grade. The study was approved by the University's IRB.

Coping Power Intervention

Since this study focuses on the effects of the delivery format of the Coping Power child intervention, only 32 sessions of the Coping Power child component (Lochman, Wells, & Lenhart, 2008) was offered, not the parent component. Children in Group Coping Power (GCP) participated in small groups of 5–6 children, with two co-leaders, and group sessions were 50–60 minutes. Children in GCP were exposed to all of the same intervention content as children in ICP, as well as some additional group-level activities (e.g., role-plays with peers, generating a group name or cheer, opportunity to earn group-level points and rewards). In addition to the group sessions, children in GCP also received the brief monthly individual sessions typically included in the Coping Power intervention. GCP leaders did not receive explicit training about deviancy training in groups, but they did receive routine training in setting and enforcing group behavior rules. Children in Individual Coping Power (ICP) met with a Coping Power leader individually for each of the 32 planned 30-minute sessions. Children in ICP completed role-plays and other interactive activities with their Coping Power leader, rather than with their peers.

Intervention Fidelity and Quality—Each leader served a similar number of GCP and ICP participants. To ensure high fidelity of implementation, two doctoral level psychologists who had substantial experience implementing Coping Power met with the interventionists weekly to monitor and provide feedback on program implementation. The interventionists also received detailed supervisory feedback on video-recorded GCP and ICP sessions on a monthly basis to ensure that program implementation remained consistent. GCP leaders and ICP leaders rated that they completely or partially completed 91.07% and 86.43% of objectives, respectively.

Measures

To identify at-risk aggressive students, fourth grade teachers completed the Teacher Report of Reactive and Proactive Aggression (Dodge, Lochman, Harnish, Bates, & Pettit, 1997) for all of the children in their class.

The study used the Externalizing and Internalizing scores from teachers' and parents' ratings on the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992), which has demonstrated strong reliability (Cronbach's alpha of .80–.89) and construct validity. The Peer Affiliation and Social Acceptance Measure (PASA; Dishion, Kim, Stormshak, & Nelson, 2014) was also completed by parents and teachers to assess for children's deviant peer relations. Internal consistency is adequate for mother (α =.73) and teacher (α =.80) report and evidence supports the PASA's convergent, concurrent, and predictive validity.

The Early Adolescent Temperament Questionnaire – Parent Report (EATQ-P; Rothbart et al., 2003) assessed the child characteristic of inhibitory control. Internal consistency for this subscale was good in prior Coping Power samples ($\alpha = .78$; Pardini et al., 2004).

Analytic Strategy

The growth curve model included three levels: (a) times of measurement, (b) nested within children, and (c) nested within the intervention units (six children per cohort per school). HLM 6.02 software was used to perform the data analyses with full maximum likelihood (FML) estimation method (Raudenbush & Bryk, 2002). The unconditional curvilinear growth models were tested by adding a time's quadratic term to the level-1 model, and the Deviance Tests indicated that the six outcomes changed over time with a significant curvature pattern, thus requiring a three-level curvilinear growth model. For teacher outcomes, time was coded as 0 as baseline, 1 as post-intervention, and 2 as 1-year-follow up, while for parent outcomes (where data collection took several months for each wave), we used the actual time interval from baseline as the time variable, with baseline set to zero. Each of the growth parameters in level-1 model has a substantive meaning. The intercept π_{0ii} (initial status at baseline), time slope π_{1ii} (the linear change rate over time), and quadratic term π_{2ii} (curvilinear change across time, captures the curvature or acceleration in each growth trajectory) were estimated in level-1 model equation (1)⁴ where Y_{tii} is the outcome score at time t for child i in intervention unit j. At level-2, the person level, we examined a child characteristic child's inhibitory control (X_{ij}) , that moderated rate of change, which was group centered. The intercept and time slope were treated as random effects at level-2. The quadratic term was treated as a fixed effect for teacher outcomes with three times of measurements, and as a random effect for parent outcomes at level-2 because of four times of measurements. The level-2 model equations were (2), (3), and (4) for parent outcomes and equations (2), (3) and (5) for teacher outcomes⁴. The intervention condition $(W_i, \text{ICP}=1 \text{ and GCP}=0)$ was included at Level-3. The intercept and time slope were random effect at Level-3, and all interaction effects were fixed effects. The Level-3 model equations were (6) to $(10)^4$, where u_{00i} , and u_{10i} were the variance of population intercept and growth rate associated with intervention units. In this model, the variation in the growth parameters was partitioned as follows: (a) the variation among children within intervention unit was captured in the level-2 model, and (b) the variation among intervention units is represented in the level-3 model. To calculate the effect size for ICP and GCP on the growth rate, we constructed a 2-level growth curve model to the six child's behavior outcomes with only intervention condition in the model. We used the Raudenbush and Liu (2001) formula for estimation standardized effect size on linear growth rate:

 $\delta = \frac{|\beta_{11}|}{\sqrt{\tau_{11}}}$

where β_{11} is intervention condition difference on the linear change rate, $\sqrt{\tau_{11}}$ is the population variation in annual linear change rate and δ is the standardized mean difference between ICP and GCP on the annual change rate.

Results

Table 2 provides the means and standard deviations for the six outcome variables from the BASC and PASA measures by intervention condition at each of the four time points. There were no significant differences between the attrition rates for the two conditions at any of the four time points for any of the six outcome measures. Attrition bias was tested by examining whether children's characteristics (gender; age; racial status; initial level of externalizing behavior in school; inhibitory control) and intervention condition status differentiated attriters from non-attriters in logistic analyses. Higher levels of baseline teacher-rated externalizing behaviors predicted higher attrition levels (across both conditions) for teacher ratings at Time 4, and older age predicted greater attrition in Time 4 parent data. Only two of the 25 predictors (the five baseline characteristics and intervention condition affecting across T2–T4 for parent data, and T3–T4 for teacher data) of possible attrition bias were statistically significant, and only one of the 25 tests of interactions between baseline predictors and condition status (baseline teacher-rated externalizing statistically significant) and means the attrition status of the statistically significant.

4

 $Y_{tij} = \pi_{0ij} + \pi_{1ij} Time_{tij} + \pi_{2ij} Time_{tij}^2 + e_{tij} \quad (1)$ $\pi_{0ij} = \beta_{00j} + \beta_{01j} (X_{ij} - \overline{X}_j) + r_{0ij} \quad (2)$ $\pi_{1ij} = \beta_{10j} + \beta_{11j} (X_{ij} - \overline{X}_j) + r_{1ij} \quad (3)$ $\pi_{2ij} = \beta_{20j} + r_{2ij} \quad (4)$ $\pi_{2ij} = \beta_{20j} \quad (5)$ $\beta_{00j} = \gamma_{000} + \gamma_{001} W_j + u_{00j} \quad (6)$ $\beta_{01j} = \gamma_{010} \quad (7)$ $\beta_{10j} = \gamma_{100} + \gamma_{101} W_j + u_{10j} \quad (8)$ $\beta_{11j} = \gamma_{110} + \gamma_{111} W_j \quad (9)$ $\beta_{20j} = \gamma_{200} \quad (10)$

predicting Time 4 teacher ratings) serving as predictors of attrition was significant. Thus, there was no systematic pattern of attrition bias across time.

When the between-source associations among the six outcome variables were examined at Time 4, all of the 15 correlations were below .34. Overall, the outcome variables were distinct enough from each other to warrant running separate growth models for each outcome.

Table 3 summarizes the results of the six HLM analyses. The quadratic growth curve was significant for the six outcomes, and thus linear slopes in the analyses need to be interpreted within the context of quadratic terms.

Effects of Time, Condition, and Moderation

The HLM analyses indicate that there was significant reduction across time in five outcomes (all except teachers' ratings of youths' involvement with deviant peers). These significant change were replicated when slopes were examined within unconditional models.

Condition effects indicate that ICP produced greater reductions in growth rates of teacherrated externalizing behavior (effect size: $\delta = .35$) and teacher-rated deviant peer involvement ($\delta = .40$) across time than did GCP, but the two conditions did not significantly differ in parent-rated externalizing behavior ($\delta = .06$), or in parent-rated deviant peer involvement (. δ = .03). To provide context for the condition effects on teacher-rated externalizing behaviors and deviant peer involvement, within condition analyses were conducted to explore whether there was a significant reduction in growth rates within both conditions. Results of the within condition growth analyses for teacher-rated externalizing problems indicated that there was a significant declining rate for both the GCP, t(29) = -4.597, p<.001, and ICP, t(29)= -2.873, p<.01, conditions. A different pattern was evident on the within condition growth analyses for teacher-rated deviant involvement, as there was a significant decline in growth rate for ICP, t(29)= -2.081, p<.05) but not for GCP, t(29)= -0.310, ns⁶.

The exploratory analyses examining condition effects on internalizing problems found that ICP did lead to significant declines in growth rates of teacher-rated internalizing problems across time in comparison to GCP (δ =.30), although condition differences were not evident in parent-rated internalizing problems (δ =.01). Results of the within condition growth analyses for teacher-rated internalizing problems indicated that there was a significant declining rate for both the GCP, t(29) = -4.087, p<.001, and ICP, t(29)=-4.818, p<.001, conditions.

⁶Because the intervention was delivered across three annual cohorts, and because a major tornado had affected the Tuscaloosa area between the intervention for cohorts 2 and 3, exploratory analyses also examined whether cohort moderated the condition effects. Reduced HLM analyses were run for each of the six outcome variables, without the baseline predictor, but with cohorts as predictor variables (two cohort dummy variables were created; one contrasted cohort 2 with cohort 1, and the other contrasted cohort 3 with cohort 1). There were no significant interactions between cohorts and intervention conditions for any of the six outcomes, indicating that the condition effects examined in this paper were not influenced by the cohorts' historical effects. Separate from the interactions were significant, indicating only limited cohort effects on outcomes. Cohort 3 had greater reductions in parent-rated internalizing than did Cohort 1, and Cohort 2 had less reduction in deviant peer involvement than did Cohort 1.

The moderation hypothesis that children with lower levels of inhibitory control would be more vulnerable to deviancy-promoting effects operating in the group format was partially supported, although only for teacher-rated externalizing behaviors. As depicted in Figure 1, children with low inhibitory control had greater reductions in growth rates for teacher-rated externalizing behavior problems when they received intervention in an individual format than when they received intervention in a group format; in contrast, children with high levels of inhibitory control benefited from the two formats in similar ways. This interaction qualifies the main effect of condition on teacher-rated externalizing behavior.

Discussion

As hypothesized, growth curve analyses indicate that aggressive children receiving the individual format did indeed have lower rates of change on teacher-rated externalizing problems and teacher-rated deviant peer involvement across time, although there were no significant intervention format effects on parent-rated measures of conduct problems. Children's baseline level of inhibitory control significantly moderated the format effect on teacher-rated outcomes. As expected, children with lower levels of initial inhibitory control were less responsive to the group intervention as reported by teacher ratings of problem behavior 1 year later.

Interpretation of the limiting effect of the group format for Coping Power is made more complicated by the fact that the two formats did not influence outcomes from parent reports. From the vantage point of parents, it does not seem to matter whether interventions are delivered in a group or individual formats; reductions in problem behavior are reported. It is also inaccurate to say that the effects of the group intervention are iatrogenic. The effect sizes for externalizing behavior reduction in the present study through the one-year follow-up (D=.34) were similar to those found in a randomized control trial of the Coping Power program (Lochman and Wells, 2003) (D=.40). Although the current study lacked a control group, and the decline in children's problems in the current study can't be directly linked to the intervention, this reduction in behavior problems (similar to the prior randomized control study) is occurring even though the Coping Power parent component was not delivered in the current study.

Children in the group and individual condition had similar decreases in teacher-rated externalizing, internalizing and deviant peer involvement at the end of the intervention, but additional teacher-reported improvements in the year after intervention were only evident for children who had received Coping Power in an individual fashion. The strong additional improvements for children seen individually may have been due to the fact that they had avoided some negative peer effects in the year after intervention. In addition to differences in peer effects, children seen individually may have learned intervention concepts and skills more deeply, and thus retained them better in the follow-up year. The individual format may have permitted the interventionists to provide more repetition of central ideas, and more individualized role-playing and practice of anger-management and problem-solving activities.

Theoretically and clinically important is the moderation of teacher-reported intervention format effects by children's self-regulation. Specifically, children in the group condition with lower levels baseline levels of inhibitory control showed less teacher-reported behavior change compared to those in the individual condition over the course of one year. This finding can be explained by two possible mechanisms. First, children with low levels of inhibitory control may be more reactive to provocations in the group (e.g., anger, aggression, etc.), or as found in previous research, more vulnerable to peer inducements to engage in problem behavior despite the group leader's guidance.

Limitations

One of the limitations of the current study is that we did not follow the youth more than 1 year following the end of the intervention. Another set of limitations are that current findings generalize best to other structured research-based interventions which intervene with children in the preadolescent age range. This age range is a transition period developmentally important for prevention purposes, but is younger than the adolescent period when clearer evidence of iatrogenic group effects are obtained (e.g. Poulin et al., 2001). Since the goal of the study was to examine how group effects operate in evidence-based interventions, the findings also do not address how poorly structured groups might operate in this age period. The Coping Power intervention was closely supervised weekly by doctoral level supervisors with extensive knowledge of the best practices in the intervention. There is some evidence to suggest that group interventions of less supervision and guidance (Cho, Hallfors et al, 2005).

Next Steps and Implications

First, when group interventions are being delivered, child characteristics should be carefully considered and assessed as potential moderators of intervention outcomes. Although children with relatively higher inhibitory control (at least high in the context of children screened for aggressive behavior problems) were found to profit adequately from a group format for intervention, children with low levels of inhibitory control appeared to profit more from individual delivery of the Coping Power intervention. Other predictors of children's response to group interventions should also be explored, including neurobiological and neuropsychological indicators of emotional activation and regulation. Children's weak inhibitory control may be addressed in part by the typical behavioral management training for parents in interventions like Coping Power (in this study of format effects, we did not include the Coping Power parent component) to reduce their risk to some deviant peer influences. In addition, the child components of interventions like Coping Power could be adapted to address children's neuropsychological limitations related to their weak inhibitory control (e.g. provide shorter intervals for behavioral monitoring; greater attention to long-term consequence for social decisions) (Matthys et al., 2012).

Second, we know remarkably little, from an empirical standpoint, about how group therapists can optimally manage and run group sessions to best counter the deviancypromoting effects that may be occurring moment-to-moment during sessions. Group therapists who allow less unsupervised time within group sessions and who carefully use

behavioral management strategies may have best outcomes (e.g., Dishion & Dodge, 2006). Rigorous research examining how different types of therapist behaviors affect children within the group sessions is crucial.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This paper has been supported by grants from the National Institute of Drug Abuse (R01 DA023156) and the National Institute of Child Health & Human Development (R01 HD079273).

References

- Bohlin G, Eninger L, Brocki KC, Thorell LB. Disorganized attachment and inhibitory capacity: Predicting externalizing problem behaviors. Journal of Abnormal Child Psychology. 2012; 40:449– 458. [PubMed: 21947617]
- Cho H, et al. Evaluation of a High School Peer Group Intervention for At-Risk Youth. Journal of Abnormal Child Psychology. 2005; 33:363. [PubMed: 15957563]
- Dishion TJ, Kim H, Stormshak EA, Neil M. A brief measure of peer association and social acceptance (PASA): Convergent and criterion validity in an ethnically diverse sample of early adolescents. Journal of Clinical Child and Adolescent Psychology. 2014; 43:601–612. [PubMed: 24611623]
- Dishion, TJ.; Poulin, F.; Burraston, B. Peer group dynamics associated with iatrogenic effects in group interventions with high-risk young adolescents. In: Nangle, DW.; Erdley, CA., editors. The role of friendship in psychological adjustment. San Francisco, CA: Jossey-Bass; 2001. p. 79-92.
- Dishion TJ, Tipsord JM. Peer contagion in child and adolescent social and emotional development. Annual Review of Psychology. 2011; 62:189–214.
- Dodge, KA.; Dishion, TJ.; Lansford, JE. Deviant peer influences in programs for youth: Problems and solutions. New York: Guilford Press; 2006.
- Dodge KA, Lochman JE, Harnish JD, Bates JE, Pettit GS. Reactive and proactive aggression in school children and psychiatrically-impaired chronically-assaultive youth. Journal of Abnormal Psychology. 1997; 106:37–51. [PubMed: 9103716]
- Lochman JE, Baden RE, Boxmeyer CL, Powell NP, Qu L, Salekin KL, Windle M. Does a booster intervention augment the preventive effects of an abbreviated version of the Coping Power Program for aggressive children? Journal of Abnormal Child Psychology. 2014; 42:367–381. [PubMed: 23417235]
- Lochman JE, Boxmeyer CL, Powell NP, Qu L, Wells K, Windle M. Coping Power dissemination study: Intervention and special education effects on academic outcomes. Behavioral Disorders. 2012b; 37:192–205.
- Lochman JE, Wells KC. Effectiveness study of Coping Power and classroom intervention with aggressive children: Outcomes at a one-year follow-up. Behavior Therapy. 2003; 34:493–515.
- Lochman, JE.; Wells, KC.; Lenhart, LA. Coping Power child group program: Facilitator guide. New York, NY: Oxford; 2008.
- Lochman JE, Wells KC, Qu L, Chen L. Three Year Follow-up of Coping Power Intervention Effects: Evidence of Neighborhood Moderation? Prevention Science. 2013; 14:364–376. [PubMed: 23065350]
- Matthys W, Vanderschuren LJMJ, Schutter DJLG, Lochman JE. Impaired neuro-cognitive functions affect social learning processes in oppositional defiant disorder and conduct disorder: Implications for interventions. Clinical Child and Family Psychology Review. 2012; 15:234–246. [PubMed: 22790712]

- Pardini D, Lochman J, Wells K. Negative emotions and alcohol use initiation in high-risk boys: The moderating effect of good inhibitory control. Journal of Abnormal Child Psychology. 2004; 32:505–518. [PubMed: 15500030]
- Poulin F, Dishion TJ, Burraston B. 3-year iatrogenic effects associated with aggregating high-risk adolescents in cognitive-behavioral interventions. Applied Developmental Science. 2001; 5:214–224.
- Raudenbush, SW.; Bryk, AS. Hierarchical linear models: Applications and data analysis methods. 2. Thousand Oaks, CA: Sage Publications; 2002.
- Reynolds, CR.; Kamphaus, RW. Behavior Assessment System for Children (BASC). Circle Pines, MN: American Guidance Service; 1992.
- Rothbart MK, Ellis LK, Rueda MR, Posner MI. Developing mechanisms of temperamental effortful control. Journal of Personality. 2003; 71:1113–1143. [PubMed: 14633060]
- Weiss B, Caron A, Ball S, Tapp J, Johnson M, Weisz JR. Iatrogenic effects of group treatment for antisocial youths. Journal of Consulting and Clinical Psychology. 2005; 73:1036–1044. [PubMed: 16392977]
- Young SE, Friedman NP, Miyake A, Willcutt EG, Corley RP, Haberstick BC, et al. Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and *environmental* relation to response inhibition across adolescence. Journal of Abnormal Psychology. 2009; 118:117–130. [PubMed: 19222319]
- Zonnevylle-Bender MJS, Matthys W, van de Wiel NMH, Lochman J. Preventive effects of treatment of DBD in middle childhood on substance use and delinquent behavior. Journal of the American Academy of Child and Adolescent Psychiatry. 2007; 46:33–39. [PubMed: 17195727]

Public Health Significance

This study finds that group formats for aggressive children can limit intervention effects in school settings for some children.



Figure 1. Interaction between Condition and Inhibitory Control on Teacher-rated Externalizing Behavior

Table 1

Sample Characteristics at Baseline

Age		
	Mean	10.17
	Range	9.17–11.79
Sex		
	Boys	65%
	Girls	35%
Race and Ethnicity		
	African American	78.1%
	Caucasian	20.3%
	Hispanic	1.4%
	Other	0.3%
Family Income		
	none	5.0%
	< \$15,000	24.9%
	\$15,000 to \$29,999	31.8%
	\$30,000 to \$49,999	20.5%
	>\$50,000	17.6%

Table 2

Mean and Standard Deviations of Behavioral Outcomes Across Time

		Ē										
Measure		T IIIIE T			T IIII 7			TILLES			I IIIe 4	
	M	<u>SD</u>	N	M	<u>SD</u>	N	M	<u>SD</u>	N	M	<u>SD</u>	Z
					Coping	Power:	Group F	ormat				
Externalizing (BASC)												
-Teacher-rated	38.79	17.53	177				30.70	17.84	168	31.88	22.87	148
-Parent-rated	27.40	13.68	180	25.28	13.52	178	23.78	11.97	165	23.71	12.55	157
Internalizing (BASC)												
-Teacher-rated	14.24	9.58	177				9.94	7.94	168	10.07	10.13	148
-Parent-rated	24.53	11.16	180	22.17	9.85	179	21.88	10.52	165	21.17	9.98	157
Deviant Peer Involvement												
-Teacher-rated	1.86	0.56	177				1.88	0.64	168	2.00	0.76	150
-Parent-rated	1.56	0.46	180	1.52	0.47	179	1.48	0.48	168	1.51	0.47	156
				С	oping Pc	wer: Iı	ndividua	Format				
Externalizing (BASC)												
-Teacher-rated	43.28	17.26	178				35.21	20.01	161	28.07	18.57	137
-Parent-rated	30.99	14.71	180	27.46	13.65	175	27.49	14.08	161	28.51	15.44	152
Internalizing (BASC)												
-Teacher-rated	16.50	8.95	178				10.81	7.53	161	7.88	7.46	137
-Parent-rated	28.51	13.84	180	24.72	11.48	175	24.61	11.51	161	24.34	11.51	152
Deviant Peer Involvement (PASA)												
-Teacher-rated	2.01	0.57	177				1.88	0.66	162	1.92	0.65	138
-Parent-rated	1.62	0.48	180	1.50	0.44	178	1.48	0.47	163	1.55	0.46	152

J Consult Clin Psychol. Author manuscript; available in PMC 2015 August 01.

Notes: BASC: Behavior Assessment System for Children. PASA: Peer Affiliation and Social Acceptance. Teacher ratings were not collected at Time 2

Author Manuscript

Author Manuscript

Lochman et al.

Table 3

Summary of 3-level Growth Curve Analyses on Growth Rate

														ſ
Variable		-	Divod Effor	÷					Ra	ndom Et	ffect			
				3		Level-3				Level-2				T T
	Coef.	SE	t-value	DF	p-value	Var	χ^2	DF	p-value	Var	χ^2	DF	p-value	г-алаг
Externalizing -Teacher														
Model for Intercept, P0														
Intercept, G000	38.09	1.69	22.53	58	0.000	40.82	117.78	58	0.000	93.49	499.29	285	0.000	185.60
IGCP, G001	5.91	2.36	2.51	58	0.015									
Inhibitory, G010	-1.17	1.31	-0.89	358	0.372									
Model for Time Slope, PI														
Intercept, G100	-8.72	2.21	-3.95	58	0.000	22.98	126.87	58	0.000	9.80	371.96	285	0.001	
IGCP, G101	-3.95	1.71	-2.31	58	0.025									
Inhibitory, G110	-1.54	1.15	-1.34	358	0.181									
Inhibitory*IGCP,G111	3.63	1.60	2.27	358	0.024									
Model TimeSQ Slope, P2														
Intercept, G200	2.69	0.95	2.84	958	0.005									
Externalizing -Parent														
Model for Intercept, P0														
Intercept, G000	27.29	1.12	24.32	58	0.000	9.32	82.02	58	0.021	156.1	1909.4	279	0.000	33.31
IGCP, G001	2.85	1.55	1.84	58	0.070									
Inhibitory, G010	-3.36	1.04	-3.24	358	0.002									
Model for Time Slope, PI														
Intercept, G100	-5.13	0.83	-6.18	58	0.000	0.03	51.20	58	>.500	55.49	464.63	279	0.000	
IGCP, G101	60.0	0.50	0.19	58	0.850									
Inhibitory, G110	0.55	0.52	1.07	358	0.287									
Inhibitory*IGCP,G111	0.13	0.76	0.18	358	0.860									
Model TimeSQ Slope, P2														
Intercept, G200	1.73	0.32	5.46	359	0.000					6.32	422.31	339	0.002	
Internalizing -Teacher														

A	
ıtho	
Ma	
snue	
scrip	
¥	

Variable			991 F						Ra	ndom Ef	fect			
			FIXED EILE	10		Level-3				Level-2				1 I 1
	Coef.	SE	t-value	DF	p-value	Var	χ^2	DF	p-value	Var	χ^2	DF	p-value	I-ləvəl
Model for Intercept, P0														
Intercept, G000	14.08	1.01	13.92	58	0.000	20.75	192.78	58	0.000	18.78	464.03	285	0.000	43.23
IGCP, G001	2.40	1.42	1.69	58	0.096									
Inhibitory, G010	-0.12	0.61	-0.20	358	0.842									
Model for Time Slope, PI														
Intercept, G100	-5.34	1.13	-4.72	58	0.000	10.24	196.34	58	0.000	0.92	352.42	285	0.004	
IGCP, G101	-2.05	0.99	-2.07	58	0.043									
Inhibitory, G110	-0.15	0.51	-0.30	358	0.767									
Inhibitory*IGCP,G111	0.15	0.65	0.23	358	0.818									
Model TimeSQ Slope, P2														
Intercept, G200	1.60	0.46	3.52	958	0.001									
Internalizing –Parent														
Model for Intercept, P0														
Intercept, G000	24.13	0.84	28.61	58	0.000	0.06	49.16	58	>.500	109.9	1822.5	279	0.000	32.47
IGCP, G001	3.24	1.16	2.79	58	0.008									
Inhibitory, G010	-1.24	06.0	-1.38	358	0.169									
Model for Time Slope, PI														
Intercept, G100	-3.54	0.78	-4.56	58	0.000	0.39	69.07	58	0.152	36.30	387.65	279	0.000	
IGCP, G101	-0.53	0.44	-1.20	58	0.235									
Inhibitory, G110	0.21	0.42	0.52	358	0.606									
Inhibitory*IGCP,G111	0.45	0.59	0.76	358	0.448									
Model TimeSQ Slope, P2														
Intercept, G200	1.05	0.29	3.61	359	0.001					2.90	339.00	339	>.500	
Peer Deviance-Teacher														
Model for Intercept, P0														
Intercept, G000	1.86	0.05	36.85	58	0.000	0.03	93.94	58	0.002	0.05	406.94	285	0.000	0.27
IGCP, G001	0.16	0.07	2.23	58	0.030									

Variahla									Da	ndom Ff	foot			
			Fived Effe	ŧ					INA		nar			
		-				Level-3				Level-2				I Iono I
	Coef.	SE	t-value	DF	p-value	Var	χ^2	DF	p-value	Var	χ^2	DF	p-value	1-1aA2T
Inhibitory, G010	0.06	0.04	1.29	358	0.199									
Model for Time Slope, PI														
Intercept, G100	-0.06	0.08	-0.71	58	0.479	0.01	85.26	58	0.011	0.01	370.75	285	0.001	
IGCP, G101	-0.13	0.05	-2.50	58	0.016									
Inhibitory, G110	-0.10	0.04	-2.36	358	0.019									
Inhibitory*IGCP,G111	0.10	0.06	1.71	358	0.088									
Model TimeSQ Slope, P2														
Intercept, G200	0.07	0.04	1.85	961	0.064									
Peer Deviance-Parent														
Model for Intercept, P0														
Intercept, G000	1.56	0.03	45.79	58	0.000	0.005	71.17	58	0.115	0.13	994.18	279	0.000	0.08
IGCP, G001	0.03	0.07	09.0	58	0.551									
Inhibitory, G010	-0.09	0.03	-2.68	358	0.008									
Model for Time Slope, PI														
Intercept, G100	-0.17	0.04	-4.20	58	0.000	0.0001	53.61	58	>.500	0.13	470.30	279	0.000	
IGCP, G101	-0.02	0.02	-0.78	58	0.436									
Inhibitory, G110	0.02	0.02	1.18	358	0.240									
Inhibitory*IGCP,G111	0.01	0.03	0.22	358	0.826									
Model TimeSQ Slope, P2														
Intercept, G200	0.07	0.02	4.13	359	0.000					0.02	463.05	339	0.000	
Note:														

1) Inhibitory Control (from the Early Adolescent Temperament Questionnaire) is a Level-2 variable

2) IGCP is the Level-3 intervention condition, and is dummy coded as 1=ICP and 0=GCP.