

# The Coping Power Program for Preadolescent Aggressive Boys and Their Parents: Outcome Effects at the 1-Year Follow-Up

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This study evaluates the effects of the Coping Power Program with at-risk preadolescent boys at the time of transition from elementary school to middle school. Aggressive boys were randomly assigned to receive only the Coping Power child component, the full Coping Power Program with parent and child components, or a control condition. Results indicated that the Coping Power intervention produced lower rates of covert delinquent behavior and of parent-rated substance use at the 1-year follow-up than did the control cell, and these intervention effects were most apparent for the full Coping Power Program with parent and child components. Boys also displayed teacher-rated behavioral improvements in school during the follow-up year, and these effects appeared to be primarily influenced by the Coping Power child component.

Aggressive children have been found to be at risk for subsequent delinquent and criminal behavior and for poor school adjustment (Coie, Terry, Lenox, Lochman, & Hyman, 1995; Lochman & Wayland, 1994; Tremblay et al., 1992). Thus, preventive interventions that are designed to interrupt these developmental trajectories toward serious antisocial behavior can be developed on the basis of developmental models of risk factors for aggression (Coie et al., 1993) and on evolving knowledge about evidence-based interventions for aggressive children (Brestan & Eyberg, 1998; Conduct Problems Prevention Research Group, 2002; Leff, Power, Manz, Costigan, & Nabors, 2001; Metropolitan Area Child Study Research Group, 2002; Nock, 2003; Reid, Eddy, Fetrow, & Stoolmiller, 1999).

## Interventions With Preadolescent Aggressive Children

In the last decade, multicomponent interventions with elements directed toward preadolescent conduct problem children and their parents, delivered during the preschool through elementary school age range, have been found to be efficacious in reducing children's aggressive and disruptive behaviors (Conduct Problems Prevention Research Group, 2002; Hawkins et al., 1992; Walker, Stiller,

Severson, Feil, & Golly, 1998; Webster-Stratton & Hammond, 1997). The clearest current evidence for the effectiveness of multicomponent preventive interventions delivered in the early elementary school age period in reducing delinquent behavior and substance use in adolescence comes from the Montreal Experiment (Tremblay, Kurtz, Masse, Vitaro, & Pihl, 1995). This intervention took place in the second and third grades and included behavioral parent training and a child component consisting of social skills and self-control training. By age 15, individuals who received the treatment reported lower levels of delinquency and substance use (Tremblay, Kurtz, et al., 1995) than the untreated controls.

Multicomponent treatments delivered during the later elementary school years just prior to children's transition to adolescence have also been found to affect children's problem behaviors, although their preventive effects on later delinquency and substance use is not yet clear. Pepler, King, Craig, Byrd, and Bream (1995) offered parent training and group social skill training to aggressive and disruptive children between the ages of 6 and 12 years old and found reductions in teacher-rated externalizing problems but not in parent-rated problem behaviors. Broader, durable effects were evident in Kazdin, Siegel, and Bass's (1992) study of the effects of parent management training and problem-solving-skills training for children, with reductions in aggressive behavior and improvements in children's social competence at school evident through a 1-year follow-up. In component analyses, the combination of both intervention elements for children and their parents can be the most effective (Kazdin et al., 1992; Webster-Stratton & Hammond, 1997). Although these treatment-focused studies have indicated that intervention, even during the latter elementary school years, can have meaningful effects on children's behavior, it is not yet clear that multicomponent interventions delivered at the time of children's transition to middle school can have preventive effects on a range of serious outcomes, including delinquency, substance use, and school behavioral problems. The current study examines this question using the Coping Power Program.

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## A Contextual Social-Cognitive Model and the Coping Power Program

Using a contextual social-cognitive model as a conceptual framework for identifying intervention objectives (Lochman & Wells, 2002a), the Coping Power Program has been developed as a multi-component preventive intervention for aggressive children. The contextual social-cognitive model focuses on the contextual parenting processes and on children's sequential cognitive processing. Aggressive children have cognitive distortions at the appraisal stage of social-cognitive processing because of difficulties in encoding incoming social information and in accurately interpreting social events and others' intentions. They also have cognitive deficiencies at the problem solution stage of social-cognitive processing by generating maladaptive solutions for perceived problems and having nonnormative expectations for the usefulness of aggressive and nonaggressive solutions to their social problems (e.g., Lochman & Dodge, 1994, 1998). Schemas involving children's expectations of others and of their control over success can have a significant impact on the information processing steps within the social-cognitive model for aggressive children (Lenhart & Rabiner, 1995; Seifer, Sameroff, Baldwin, & Baldwin, 1992).

The contextual social-cognitive model also emphasizes parenting processes in the development and escalation of problem behaviors. As articulated by Patterson, Reid, and Dishion (1992), child aggressive behavior arises most fundamentally out of early contextual experiences with parents who provide harsh or irritable discipline, poor problem-solving, vague commands, and poor monitoring of children's behavior. Inconsistency in parental discipline and low parental involvement with children have been linked to child aggression (Capaldi & Patterson, 1991).

On the basis of this contextual social-cognitive model, a Coping Power Program with parent and child components was developed. The Coping Power Program has been found to produce lower rates of substance use, reductions in proactive aggression, improved social competence, and greater teacher-rated behavioral improvement at the end of intervention, in comparison with children who had not participated in the Coping Power Program (Lochman & Wells, 2002b). However, it is not clear whether these effects would be maintained at a follow-up period and whether the total combined intervention would produce greater improvement than the Coping Power child component only. The current study, with a different sample, is designed to address these issues.

### Hypotheses

The current study is designed to test two sets of hypotheses. First, we hypothesized that the Coping Power Program would have significant effects on boys' self-reported covert and overt delinquency and substance use, on parents' reports of their sons' substance use, and on teacher-rated behavioral improvement at school at a follow-up assessment in middle school 1 year after the end of the program. As noted, preventive interventions delivered in the preadolescent years have not documented preventive effects on multiple types of serious antisocial behaviors, including delinquency and substance use, in follow-up periods. Second, we hypothesized that a condition consisting of the total Coping Power intervention, with parent and child intervention components,

would have greater effects relative to the control condition than would another intervention condition that has only the Coping Power child component. Analyses determine whether these intervention effects are moderated by boys' ethnicity, age level, or initial level of risk status.

In addition to examining the differences between intervention and control conditions on delinquency, substance use, and school behavior outcomes at the 1-year follow-up, it has become important in intervention research to determine whether the intervention children have moved to within a normative range at follow-up (Kendall, Marrs-Garcia, Nath, & Sheldrick, 1999; Sheldrick, Kendall, & Heimberg, 2001). The current study also makes normative comparisons between intervention boys' outcome scores and those of a nonrisk group of boys.

## Method

### Procedure

Screening and Time 1 baseline assessment were conducted in the winter of 1997 with two annual cohorts of fourth- and fifth-grade boys. Intervention began in the spring of that academic year and continued throughout the following academic year, when boys were in either fifth or sixth grade. Intervention thus covered a 15-month period of time. Time 3 one-year follow-up assessments were collected two summers after intervention (when boys had completed either sixth or seventh grade). Dependent measures were individually administered to primary caretakers and boys by research assistants who were uninformed about the boys' intervention status. Dependent measures were collected from the adults identified as the primary caretaker during the past 6 months (usually the mother, but it could have also been the father, the grandparent, other relative, or the foster parent).

### Participants

Using a multiple-gating approach, teachers used the teacher screen at the first gate to rate all students in their fourth and fifth grade classes in 11 schools. The teacher screen consisted of 1-5 ratings on physical aggression, verbal aggression, and disruptiveness for each child, and these three items were summed to create a total screen score. At the same time, teachers indicated students' gender and racial status, and they estimated each child's cognitive ability on a 5-point scale, ranging from 0 = *substantially below average* (approximate IQ in the 70s), 1 = *low average* (approximate IQ of 80-90), 2 = *average* (approximate IQ of 90-110), 3 = *above average* (approximate IQ in the 110s), and 4 = *substantially above average* (approximate IQ above 120). Only boys were selected for possible inclusion in this prevention study. Although more needs to be known about characteristics and outcomes of intervention for aggressive girls, insufficient funding was available to obtain a large enough sample to adequately analyze sex differences, and previous research had not indicated that aggressive behavior predicted the risk of substance use as well for girls as for boys.

A total of 1,578 boys were screened across the two cohorts. Fourth-grade boys who had been screened in the 1st year for Cohort 1 were again screened when they were in fifth grade in the 2nd year for Cohort 2. Boys who had already been selected for the Cohort 1 final sample were dropped from the Cohort 2 pool. Boys who had raw scores of at least 7 on the teacher screen were identified as potential participants. The 546 boys who passed the initial screen were in the top 22% of the total students. After boys were identified as potential risk participants at the initial Gate 1 Teacher Screen, parents were contacted to provide consent for the Gate 2 Teacher Report Form (TRF; Achenbach, 1991) screen and for the Gate 3 parents' Child Behavior Checklist (CBC) screen (Achenbach, 1991). Four

boys were dropped from the pool because their teachers' TRF screen scores were too low (below a T-Score of 60), and 16 boys were dropped because the parents' CBC screen scores were too low (below a T-Score of 55). In addition, 15 boys were dropped because they were already participating in a prevention research study. The target sample size in this grant-funded study was 180 at-risk boys, and we did not further attempt to contact the families of 93 boys for consent after we had gathered a sample of 183. Of the remaining boys' parents whom we contacted, we had a consent rate of 59% ( $N = 183$ ). This relatively low consent rate could have been higher if, rather than phone contacts, in-person contacts were made with parents. Reasons for nonconsent included the following: parent unwilling to commit time ( $n = 33$ ); project was not perceived as a benefit to the child ( $n = 20$ ); moved ( $n = 30$ ); and personal, unspecified, and other ( $n = 89$ ). Analyses indicated that there were no significant differences between the children in the risk pool with consent (WC;  $N = 183$ ) and children without consent (WOC) in terms of grade level (WC: 55% fourth grade, 45% fifth grade; WOC: 60% fourth grade, 40% fifth grade), race (WC: 38% White, 61% African American, 1% other; WOC: 31% White, 66% African American, 3% other), and total screen score (WC: 9.3; WOC: 9.6). The WOC children did have a significantly lower cognitive estimate score (WC: 1.7; WOC: 1.5), but in general the boys for whom we obtained consent were similar in aggressive behavior, racial status, and age level to boys for whom we did not receive consent, and thus the sample is generally representative of risk children within the school system.

The 183 WC boys across the two cohorts were randomly assigned to the child intervention (CI) only condition ( $N = 60$ ), the child plus parent intervention (CPI) condition ( $N = 60$ ), or the control (C) condition ( $N = 63$ ). The children in the C condition received services as usual within their schools. The mean family income levels for the three at-risk conditions were 5.4 ( $SD = 3.5$ ) for CI, 5.6 ( $SD = 3.7$ ) for CPI, and 5.8 ( $SD = 3.5$ ) for C. Family income levels were reported by the boys' primary caretakers and were coded in 12 levels (in thousands of dollars: 1 = less than 10, 2 = 10, 3 = 15, 4 = 20, 5 = 25, 6 = 30, 7 = 35, 8 = 40, 9 = 50, 10 = 60, 11 = 75, 12 = 100 or more).

### *Equivalence of Attrited and Nonattrited At-Risk Participants*

Slightly different degrees of attrition were evident for different types of measures from Time 1 to Time 3. The summer interview battery, including the child self-report and parent-report measures, was administered to 70% of the original boys ( $N = 128$ ) and 69% of the original parents ( $N = 127$ ) at the Time 3 one-year follow-up. Teacher measures collected at Time 3 were available on 133 participants (73% of the original sample). The attrition analyses examined whether attrited participants were different than nonattrited participants within the children's data, the parents' data, and the teacher measure. Attrition analyses were conducted with general linear model analyses of variance (ANOVAs;  $2 \times 3$ ) and with chi-square analyses, using the attrition variable (attrited, nonattrited) and the source of data as the independent variables. Dependent variables were children's aggression screening score, teachers' estimate of children's cognitive abilities at screening, and race (categorized as White and minority). There were no significant differences between attrited and nonattrited participants on the aggression screening score, race, or the teacher ratings of boys' cognitive abilities. Thus, the sample available for the analyses by Time 3 is representative of the original sample at baseline.

### *Equivalence of the Three At-Risk Conditions at Baseline for the Follow-Up Sample*

Equivalence analyses were conducted for each dependent measure using only the participants who had Time 3 data (having at least teacher data), rather than with the original full sample. General linear model ANOVAs were conducted with children's screening score, cognitive-ability estimate,

ethnic status, grade level at screening (fourth or fifth grade), and the baseline levels of the Time 2 and Time 3 variables examined in this study. Of the 15 dependent variables, there were no significant baseline differences between conditions for any of the variables, indicating that, even with attrition taken into account, the three conditions were comparable at baseline.

### *Selection and Characteristics of the Normative Sample*

The normative sample ( $N = 63$ ) was selected to be representative of the nonrisk portion of the population. Boys who scored in the lower 78% of the children and who had been assessed for aggressive disruptiveness with the teacher screen were eligible. The normative sample had a mean total screen score of 4.0 ( $SD = 1.1$ ), mean teacher-rated cognitive estimate of children's ability of 2.0 ( $SD = 0.9$ ), and mean family income level of 7.3 ( $SD = 2.9$ ; representing an income range of \$35,000–\$40,000). The normative sample included 64% fourth graders and 36% fifth graders. The racial distribution was 47% African American and 53% White. There was 12.7% attrition in the normative group by the Time 3 assessment, but there were no significant differences between attrited and nonattrited participants in terms of grade level, screen score, teachers' ratings of children's cognitive estimate, family income, or racial status.

### *Intervention Implementation*

The attendance rate at child-group sessions was 83%, and the attendance at parent groups was 49%. Implementation measures indicated that intervention staff scheduled 1.4 individual meetings per month with target children to reinforce and support their goal-setting efforts and their use of intervention procedures. These individual meetings continued for boys who moved during intervention from schools that had groups to other schools without groups. For boys who began intervention at the end of fifth grade, the groups they attended were reconstituted in sixth grade because of boys' moves from elementary schools to various middle schools. The Coping Power intervention has two components (parent focus; child focus) that have been described in detail elsewhere (Lochman, Wells, & Murray, in press).

*Child component.* The child component included eight intervention sessions in the 1st intervention year and 25 in the 2nd intervention year. Group sessions lasted for 40–60 min per session. The group sessions included four to six boys and were co-led by a grant-funded staff family-school program specialist (FSPS) with a master's or doctoral degree in psychology or social work and by a school guidance counselor. The Coping Power child component was primarily derived from a previously evaluated 18-session Anger Coping program (Lochman, 1992). The Coping Power child component sessions included a focus on the following items: behavioral and personal goal setting, awareness of feelings and associated physiological arousal, use of coping self-statements, distraction techniques and relaxation methods when provoked and made angry, organizational and study skills, perspective taking and attribution retraining, social problem-solving skills, and dealing with peer pressure and neighborhood-based problems by using refusal skills.

*Parent component.* The Coping Power parent component consisted of 16 parent group sessions over the same 15-month intervention period. The parent component was delivered in groups of four to six single parents or couples, and groups usually met at the boys' schools. Groups were led by two grant staff persons (typically one FSPS and one graduate student). Assertive attempts were made to promote parent attendance (Lochman & Wells, 1996) and to include mothers and fathers in parent groups, although in most cases only one parent (usually the mother or female caretaker) attended. A supervised child waiting room was provided for parents who had no access to babysitters. Parents received a \$10 stipend for attending parent sessions. The content of the Coping Power parent component was derived from social-learning-theory-based parent training programs (e.g.,

Patterson et al., 1992). Parents learned skills for identifying prosocial and disruptive behavioral targets in their children, rewarding appropriate child behaviors, giving effective instructions and establishing age-appropriate rules and expectations for their children, applying effective consequences to negative child behavior, and establishing on-going family communication through weekly family meetings. In addition, parents learned to support the social-cognitive skills that children learn in the Coping Power child component and to use stress-management skills to remain calm and in control during stressful or irritating disciplinary interactions with their children.

*Intervention integrity.* Intervention manuals indicated the sessions' goals and the specific activities to be used in the sessions to attain those goals. Although some degree of individualization of the intervention was permitted for specific children or parents, allowing the interveners to spend more time on certain sections of the intervention to address children's or parent's particular deficits, all sections of the interventions were administered. All grant-funded staff, as well as school counselors, received a 10-hr training program prior to the start of and during the intervention and received weekly scheduled supervision on their intervention work. Intervention staff rated the level of accomplishment of each objective at the end of each intervention session, and these checklists were reviewed by the supervisors in the weekly supervision sessions. In addition, some intervention sessions were audio- or videotaped. The supervisors reviewed taped sessions on a random basis, and supervisors directly observed the delivery of some sessions.

### Assessment Measures

Five Time 3 outcome measures were assessed. Two of the outcome variables were assessed only at Time 3 (parent-reported substance use by child and teacher rating of children's improvement during the follow-up year) and the three other outcome variables had Time 1 scores that were included in analyses (child-rated substance use, child-reported covert and overt delinquency). The outcome measurement was multisource, with one completed by parents, one by teachers, and three by children's self-report.

Overt and covert delinquency was assessed by boys' self-reports of their delinquent behavior, using the National Youth Survey (NYS; Elliott, Huizinga, & Ageton, 1985). The delinquency section of the NYS includes 40 offenses representative of the full range of offenses in the Uniform Crime Report, and participants indicate the number of times they have performed each of the behaviors in the past year. These offenses are clustered into seven types of delinquency: minor assault, felony assault, robbery, minor theft, felony theft, fraud, and destruction of property. Because a few participants reported high rates of some of these behaviors, creating skewed distributions, each of these seven clusters was recoded as a binary variable as either having occurred or not in the past year, and then the seven binary variables were summed to create a covert delinquency score (minor theft, felony theft, fraud, destruction of property) and an overt delinquency score (minor assault, felony assault, robbery). To further reduce skewness and kurtosis to within ranges that would produce scores suitable for parametric analyses (i.e., skewness < 1, kurtosis < 2), logarithmic transformations of these two delinquency scores were computed. The covert delinquency and overt delinquency scores were moderately correlated at baseline,  $r(181) = .47, p < .01$ , and these two scores were analyzed in a multivariate analysis. Adequate construct validity for this form of self-reported delinquency has been found (Elliott et al., 1985).

The NYS also provides for assessment of substance use behavior (Elliott et al., 1985). The participants reported their rate of use of alcohol and of marijuana during the past year. These items were converted to binary variables (use, nonuse) and summed to create a youth self-report of substance use, and logarithmic transformations were computed for the youth substance use score. Adequate construct validity has been found for this self-report of youth substance use (Elliott et al., 1985).

Parents' reports of youth substance use were assessed with four items indicating the frequency and amount of alcohol and marijuana use that

youth displayed in the past year. Standardized scores for each item were summed to create a parent-reported substance use score, and a logarithmic transformation was computed for this variable.

Teachers rated children's behavioral improvement at school during the follow-up year (Conduct Problems Prevention Research Group, 2002). This Time 3 measure was the mean of two items indicating children's improvement in behavioral problems and in their problem solving and anger management, using a 0–6 rating scale (from *has gotten worse* to *great improvement*). The teachers who completed these improvement ratings covering the follow-up year were not informed about which condition boys had been assigned and thus were assumed to be blind raters, although blindness was not directly assessed.

### Results

The results of ANOVAs and analyses of covariance (ANCOVAs) are presented first, indicating the effects of intervention on outcome variables at the Time 3 one-year follow-up, using only the at-risk sample. Next, normative comparisons are presented for those outcome variables with intervention effects.

#### *Intervention Effects on Outcome Variables at the 1-Year Follow-Up*

Intervention effects were tested with either ANOVAs, multiple analyses of covariance (MANCOVAs), or ANCOVAs, using general linear models. Dependent variables were the Time 3 outcome variables. When Time 1 baseline scores were available for an outcome variable, the Time 1 scores were used as a covariate in an ANCOVA (self-reported substance abuse) or MANCOVA (self-reported overt and covert delinquency), and when Time 1 scores were not available for the outcome variable (parent-reported youth substance use, teacher ratings of behavioral improvement during the follow-up year), ANOVAs were conducted. The initial analysis for each dependent variable examined the main effects for the four independent variables of intervention (1 = *intervention*, 2 = *control*), ethnic status (0 = *nonminority*, 1 = *minority*), grade level during intervention (4 = *fourth and fifth grades*, 5 = *fifth and sixth grades*), and the screening status level (0 = *moderate*, 1 = *high*), and the three interaction effects for Intervention  $\times$  Ethnic Status, Intervention  $\times$  Grade, and Intervention  $\times$  Screening Status. The interaction effects with intervention were dropped if they were nonsignificant. The interaction effects were interpreted only if there was a significant effect for intervention. If a significant main effect for intervention existed, then two planned comparisons were conducted, comparing the CI alone with the C condition, and comparing the CPI with the C condition. The means and standard deviations for the outcome variables for the at-risk sample are contained in Table 1.

*Delinquency.* The MANCOVA for participants' self-reported delinquency indicated that Intervention boys had greater reductions in covert delinquent behavior than did the C boys,  $F(1, 118) = 3.33, p < .04$  (effect size = .25). The MANCOVA indicated a significant overall intervention effect,  $F(2, 119) = 3.57, p = .03$ . None of the interaction effects with intervention were significant. There were no significant intervention effects on overt delinquency. When the planned ANCOVA intervention cell contrasts were conducted for covert delinquency, the CI condition was not different from the C condition, but the CPI condition produced significantly greater reduction in covert delinquency

Table 1  
Means and Standard Deviations of Outcome Variables at 1-Year Follow-Up

Variable	Time	CI		CPI		C	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Covert delinquency (child report)	Follow-up	.54	.59	.34 <sub>a</sub>	.51	.60 <sub>b</sub>	.74
	Pre	.55	.59	.59	.66	.67	.65
Overt delinquency (child report)	Follow-up	.60	.49	.57	.46	.56	.51
	Pre	.65	.57	.68	.51	.68	.50
Substance use (parent report)	Follow-up	.31	.88	-.07 <sub>a</sub>	.44	.37 <sub>b</sub>	.93
Substance use (child report)	Follow-up	.19	.35	.23	.36	.15	.31
	Pre	.19	.31	.13	.27	.10	.24
School behavior improvement	Follow-up	2.86 <sub>b</sub>	1.46	2.76 <sub>b</sub>	1.50	2.26 <sub>a</sub>	1.41

*Note.* The upper numbers in each pair are the means and standard deviations at the Time 3 follow-up; the lower numbers are baseline scores (Time 1) collected for that variable. Means with different subscripts were significantly different in planned contrasts. CI = child intervention; CPI = child plus parent intervention; C = control; Pre = baseline prior to intervention.

than did the C condition,  $F(1, 78) = 4.22, p = .04$  (effect size = .42). It can be noted that the self-reported delinquency scores of all groups declined over time, potentially because of the boys' restriction in their self-reports of problem behaviors across repeated assessments.

**Substance use.** The ANOVA for parent-reported alcohol and marijuana use by their boys indicated that Intervention boys had lower substance-use rates at the Time 3 follow-up than did the Control boys,  $F(1, 111) = 4.85, p = .03$  (effect size = .31). The interaction effect for Intervention  $\times$  Ethnic Status was also significant,  $F(1, 111) = 8.91, p < .01$ , indicating that Intervention White boys had lower substance-use rates ( $M = .18, SD = .74$ ) than did Control White boys ( $M = .99, SD = 1.07$ ). The substance-use rates for Intervention minority ( $M = .08, SD = .70$ ) and Control minority ( $M = .01, SD = .61$ ) were relatively similar, and both were lower than the cells for White boys. The planned intervention cell contrasts indicated the CI condition was not different from the C condition, but the CPI condition produced significantly greater reduction in parent-rated substance use than did the C condition,  $F(1, 74) = 11.43, p < .01$  (effect size = .64). The ANCOVA for boys' self-reported substance use did not indicate an intervention effect.

**School behavior.** The ANOVA for teacher-rated behavioral improvement at school indicated that Intervention boys had greater behavioral improvement during the follow-up year than did the Control boys,  $F(1, 130) = 11.76, p < .01$  (effect size = .38). The interaction effect for Intervention  $\times$  Ethnic Status was also significant,  $F(1, 130) = 12.72, p < .01$ , indicating that Intervention White boys had higher ratings of behavioral improvement at school ( $M = 3.52, SD = 1.28$ ) than did Control White boys ( $M = 1.74, SD = 1.00$ ). The planned intervention cell contrasts indicated that the CI condition had greater behavioral improvement than did the C condition,  $F(1, 84) = 10.52, p < .01$  (effect size = .42), and the CPI condition had greater behavioral improvement than did the C condition,  $F(1, 86) = 7.01, p = .01$  (effect size = .34).

#### Normative Comparisons for Intervention Outcome Effects

Two types of normative comparisons are made. First, ANOVAs were conducted to determine whether control aggressive children

were significantly different than normative children on the outcomes that had been found to be significantly affected by intervention, and then ANOVAs indicated whether the intervention children were significantly different than the normative sample. Second, normative comparisons were conducted to determine whether the normative and intervention means were sufficiently close to be considered clinically equivalent using equivalency testing (Kendall et al., 1999; Sheldrick et al., 2001).

**Differences in outcomes between normative, at-risk control, and intervention groups.** When the aggressive control group was compared with the normative group at the 1-year follow-up, ANOVAs indicated that the aggressive boys had higher levels of covert delinquency,  $F(1, 80) = 4.03, p < .05$  (normative  $M = .40, SD = .58$ ), and weaker levels of behavioral improvement at school,  $F(1, 92) = 8.68, p < .01$  (normative  $M = 3.14, SD = 1.53$ ), in comparison with the normative group of boys (refer to Table 1 for the means for the aggressive control group). The difference in the parent-rated substance-use rates for aggressive control boys and normative boys was not significant,  $F(1, 81) = 1.85, ns$  (normative  $M = .12, SD = .79$ ). ANOVAs that compared the intervention aggressive boys with the normative boys found that the intervention and normative boys were not significantly different from each other in their rates of self-reported covert delinquency,  $F(1, 128) = .16, ns$ , in parent-reported alcohol and marijuana use,  $F(1, 119) = .01, ns$ , and in teacher-rated behavioral improvement at school,  $F(1, 134) = 1.49, ns$ . This pattern of comparisons between the normative boys, the aggressive control boys, and the intervention boys indicates that intervention moved aggressive boys' risk for delinquency and school behavioral problems from a nonnormative range to a normative range by the 1-year follow-up.

**Equivalency testing.** As a second method for making normative comparisons, equivalency testing (Kendall et al., 1999; Sheldrick et al., 2001) was used to determine whether normative and intervention means were sufficiently close to be considered clinically equivalent. Using the formula specified by Sheldrick et al. (2001), we conducted one-tailed  $z$  tests using one standard deviation around the normative mean as the range of closeness. These tests indicated that the aggressive intervention boys were signifi-

cantly within normative limits in their rates of covert delinquent behavior ( $z = 5.23, p < .01$ ), their parent-reported levels of substance use ( $z = 5.58, p < .01$ ), and their school behavioral problem improvements ( $z = 2.98, p < .01$ ).

### Discussion

The current results indicate that the Coping Power Program had significant impact on three of five key follow-up outcomes. The findings are among the first to suggest that a preventive intervention delivered to high-risk preadolescent aggressive children at the time of transition to middle school can prevent certain antisocial problem behaviors as the boys move into adolescence and can have sustained effects even 1 year after the program has ended. The developmental trajectory leading to antisocial behavior (Loeber, 1990) appears to have been at least partially deflected by the Coping Power intervention.

#### *Outcomes at the 1-Year Follow-Up*

A notable finding was that boys who had participated in the program along with their parents during the later years of elementary school and the 1st year of middle school had lower rates of self-reported covert delinquent behavior (theft, fraud, property damage) by the time of the 1-year follow-up, although there were no intervention effects on overt delinquency (assault, robbery). The positive intervention effect on covert delinquency was apparent only for the children who had been in the Coping Power condition that had both the parent and child components.

The overall intervention results for substance use were mixed. Although there were no intervention effects on boys' self-reported substance use, there were intervention effects on parent-reported substance. Thus, it appears that the Coping Power intervention did produce follow-up effects at least on the type of youth substance use that would be most apparent to parents. This indication of program effects on parent-reported substance use is consistent with prior research that had found the related Anger Coping program for boys to produce lower rates of child-reported substance use at a 3-year follow-up (Lochman, 1992), and with the companion study on Coping Power with another sample that had found lower child-reported substance-use rates at postintervention (Lochman & Wells, 2002b) and at a 1-year follow-up (Lochman & Wells, 2003). It is not clear why the intervention did not produce self-reported substance-use effects in the current study, in contrast with the two prior studies, although the intervention children in the current study were somewhat older than with the other two samples, and more of the intervention was delivered when children had moved into middle school. Perhaps organized group intervention that is primarily delivered immediately prior to the middle school transition can produce greater effects on youths' self-reported substance use.

The Coping Power Program also had significant follow-up effects on teachers' ratings of children's improvements in school behavioral problems during the academic year after the program was completed. Boys who had been in the Coping Power Program demonstrated increasing behavioral improvements in school across the follow-up year, suggesting that intervention-produced changes in children's abilities to cope effectively with difficult peer and adult conflicts had continued to grow in the year following inter-

vention. The sources of these data (the teachers during the follow-up years) were presumed to be unaware of the boys' intervention status during the prior years and were thus potentially free of the bias involved with knowledge of intervention assignment. In contrast with the intervention effects on covert delinquency and parent-rated substance-use outcomes, both intervention conditions contributed to the boys' gains in school-behavioral functioning. Thus, in the case of boys' behavior at school, the Coping Power child component, with its focus on boys' abilities to resolve problems with peers and teachers, appeared to be critical for producing sustained change in the school environment.

*Coping Power parent and child components.* In general, both the Coping Power parent and child components appear to have important roles in influencing boys' functioning at a 1-year follow-up. Although the child component influenced improvements in boys' behavior at school, the Coping Power parent component appeared to be the most critical intervention influence on boys' covert delinquency and substance use at follow-up. Because of limitations in the available funding for this study, a full-compartmental design was not used. There was no intervention condition for the Coping Power parent component by itself. As a result, it cannot be conclusively determined whether the effects obtained for the condition having the Coping Power parent and child components were due only to the presence of the parent component (the child component only condition produced delinquency and parent-rated substance-use outcomes similar to the control condition) or to the possible synergistic effect of having integrated and coordinated parent and child intervention components together. Although some research has found that multicomponent parent and child interventions have produced the best outcomes (e.g., Kazdin et al., 1992; Webster-Stratton & Hammond, 1997), other research has found that an adolescent group intervention can actually produce iatrogenic effects even when it is delivered with a parent intervention (Dishion & Andrews, 1995). In the current study there was no evidence of global iatrogenic effects of the Coping Power CI delivered during the preadolescent years on the Time 3 outcomes, but future research is required to determine whether the Coping Power child component substantially augments the parent intervention in producing preventive effects on the delinquency and substance-use outcomes.

*Moderator effects.* There was no evidence that the intervention effects on the Time 3 outcomes were moderated by the boys' initial severity of aggressive behavior or by the grade levels (fourth–fifth vs. fifth–sixth) used for the intervention, suggesting that the intervention operated on outcomes in relatively similar ways with fourth- through sixth-grade boys who ranged from moderate to high risk. In contrast, there was evidence that Coping Power had clearer effects on White boys' parent-rated substance use and school behavior functioning than was the case for minority children, most of whom were African American. Minority control boys had low rates of parent-rated substance use at follow-up, and there was little opportunity for intervention to produce lower levels of substance use than the control boys' rates. It should be noted that the intervention did have equivalent effects for minority and White boys on the covert delinquency outcome. Thus, it appears that Coping Power can impact children of different racial backgrounds but that the program needs to be refined to impact school behavior of minority youth at follow-up.

*Normative comparisons.* Not only did the Coping Power program produce positive changes in intervention boys' covert delinquency, lower levels of parent-reported substance use, and more teacher-rated school behavior improvement, in comparison with the untreated aggressive boys, but the Coping Power intervention moved boys into a normative range on these outcomes. The movement of the intervention boys into a normative range enhances the significance of the Coping Power outcome effects and strengthens its social policy implications.

### Summary

Certain limitations are evident in this study, including the relatively small sample size, the inclusion of only boys in the sample, and the lack of Time 1 assessment of parent ratings of youth substance use. A low initial consent rate and the presence of some attrition over time limit the representativeness of the sample and the generalizability of the findings, although the analysis of attrition and consent bias suggest that the obtained follow-up sample is relatively representative. The pattern of declining self-reports of delinquency during this period of expected increases in delinquency raises concerns about the accuracy of the obtained delinquency prevalence rates. In addition, because screening was conducted when boys were 10–11 years of age, it is not possible to distinguish between at-risk boys who displayed early-onset conduct problems versus those with more recently emerging difficulties. Because service use of boys in the control group was not assessed, it is not possible to characterize the usual services provided to boys not participating in the Coping Power Program. Despite these limitations, the results are encouraging. Preventive interventions delivered to aggressive boys and their parents at the time of the transition to middle school can have impacts on important outcomes at the time of follow-up and can move these boys into a normative range of covert delinquent behavior, parent-reported substance use, and school behavior problems. The effect sizes for positive outcomes across both intervention cells (ranging from .25 to .38), and for the specific intervention cell, which included both intervention components (ranging from .34 to .64), compares favorably to the results from other prevention research in this area that typically finds effect sizes in the .2–.4 range (e.g., Conduct Problems Prevention Research Group, 1999, 2002; Leff et al., 2001; Metropolitan Area Child Study Research Group, 2002), although some large effect sizes in the .9–1.0 range have been reported (e.g., Walker et al., 1998).

Although it was beyond the scope of this article, and not possible to test whether changes in the targeted intervention variables mediated levels of follow-up outcome variables within the relatively small subsamples within each of the experimental conditions, future research should explore mediational models. Future preventive intervention research can also be refined to more directly target, in culturally relevant ways, the processes involved in the contextual social–cognitive model described in this article and to examine the effects of booster interventions to maintain these follow-up effects.

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