

The Effects of Aggression Replacement Training on Male and Female Antisocial Behavior in a Runaway Shelter

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Objective: A field study was conducted to test the effect of Aggression Replacement Training on male and female antisocial behavior in a runaway shelter. Method: An interrupted time series design was used in this study. The case records of 522 adolescents who stayed in a runaway shelter over a 519-day period were reviewed and measures of antisocial behavior obtained. Results: The results suggested that the implementation of the Aggression Replacement Training was associated with a decrease in male and female antisocial behavior in the shelter and that the effect on male antisocial behavior depended on the number of males in the shelter. Conclusion: The results suggested that the Aggression Replacement Training may be a useful component of a multicomponent approach to reducing juvenile antisocial behavior in a short-term residential setting.

Antisocial behavior, defined as such acts as running away, stealing, and vandalism, is common, with estimates suggesting that up to one half of all referrals of children and adolescents to outpatient clinics are for this type of problem (McMahon & Forehand, 1988). Weisz, Weersing, and Valeri (1997) note that the most commonly treated child and adolescent mental health problems involve antisocial behavior. Antisocial behavior problems are extraordinarily costly not only to society but also to the individuals who engage in this behavior and to their families and victims (Kazdin, 1995). Child and adolescent antisocial behavior portends such adulthood problems as drunken driving, antisocial personality, alcoholism, marital problems, and psychiatric disorders (Farrington, 1991).

Unfortunately, few interventions have been shown to reduce levels of antisocial behavior, and research on treatments for antisocial behavior problems

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is a critical research priority (Kazdin, 1995). One promising intervention is a multicomponent program called Aggression Replacement Training (ART) (Goldstein & Glick, 1994a; Goldstein, Glick, Irwin, Pask-McCartney, & Rubama, 1989; Goldstein, Glick, Reiner, Zimmerman, & Coultry, 1987). This program combines anger control training, social skills training, and moral reasoning education into what is usually a 10-week program. This program has been investigated in several studies. One involved 60 youths incarcerated at a limited-security youth facility (Goldstein, Glick, Reiner, et al., 1987). In this quasi-experiment, ART was compared with brief instruction and no-treatment control conditions. Results suggested that youths in the ART condition, compared with both control conditions, showed lower rates and intensity of antisocial behavior. These results were replicated when all control subjects subsequently went through the ART program. In a 1-year period following initiation of ART at this facility, 54 youths were released, 17 of whom had received ART. Blind ratings of these youths' community functioning revealed that ART youths were significantly superior to non-ART youths in several areas of prosocial functioning. This research was subsequently replicated with 51 youths in a maximum-security facility (Goldstein & Glick, 1994a; Goldstein, Glick, Reiner, et al., 1987), with results similar to those obtained in the limited-security facility.

Another study focused on 84 youths on a post-release, community living basis (Goldstein & Glick, 1994a; Goldstein, Glick, Irwin, et al., 1989). This randomized study compared three conditions: ART for adolescents and family members, ART for adolescents alone, and no treatment. Results showed that the youths in the two ART conditions reported significant reductions in anger levels and demonstrated significant increases in skill levels. Rearrest rates over 6 months for youths who were in the ART for adolescents alone condition were 15%; for youths in the ART for adolescents and family members condition, 15%; and for youths in the no-treatment condition, 43% (Goldstein & Glick, 1994a).

In another investigation of ART, Goldstein and Glick (1994b) randomly assigned 12 New York street gangs to two conditions: ART (6 gangs) and no-ART (6 gangs). The ART group went through a 4-month ART program, whereas the no-ART control group did not. The gang members in the ART group demonstrated significant improvement in six skills categories, and over an 8-month tracking period, 52% of the no-ART gang members were arrested and only 13% of the ART gang members were arrested (Goldstein & Glick, 1994a, 1994b).

Leeman, Gibbs, Fuller, and Potter (1991) combined ART with a motivation intervention and compared this combination with motivation only and

no-treatment control groups in treating juvenile offenders in a medium-security institution. The combined group showed highly significant improvements in antisocial behavior relative to both control groups. Furthermore, the recidivism rates for the members of the combined treatment group were 15% at both 6 months and 12 months postrelease from the institution. In contrast, the recidivism rates for the members of the motivation-only group increased from 25% at 6 months postrelease to 35% at 12 months. The recidivism rates for the members of the no-treatment group increased from 30% at 6 months postrelease to 40% at 12 months (Goldstein & Glick, 1994a; Leeman et al., 1991).

These studies all suggested ART to be a promising program for aggressive, antisocial youths. These studies were conducted in settings in which the ART program was stretched out during a time period ranging from 10 to 24 weeks and involved once-a-week meetings of each of the component groups (anger control, social skills, and moral reasoning), with a 1-week interval between subsequent meetings (see Goldstein, Glick, Reiner, et al., 1987, for complete treatment manuals). This structure limits the applicability of the program to similar settings. There are numerous residential settings in which adolescents with antisocial behavior problems stay for time periods less than this 10-week minimum, and the ART program represents one potential treatment for antisocial behavior problems that has not yet been tested in such short-term facilities.

The research reported in this article tested the effects of a condensed version of the ART program on the antisocial behavior of adolescents in a runaway shelter in which the average length of stay was about 3 weeks. Earlier results from this study were reported by Nugent, Bruley, and Allen (1998). These earlier results focused on the overall effect of the ART program on antisocial behavior in the shelter. Nugent et al. (1998) found about a 20% decrease in the overall rate of antisocial behavior in the shelter concomitant with the start of the ART program. The results reported in this article elaborate on those reported by Nugent et al. and concern the following research questions: (a) Was the ART program associated with a decrease in the rate of male antisocial behavior? (b) was the ART program associated with a decrease in the rate of female antisocial behavior? and (c) did the number of males in the shelter and/or the number of females moderate the effects of ART on either the male or female rates of antisocial behavior.

METHODOLOGY

Sample

Data on the antisocial behavior of all adolescents ($N = 522$) resident in the facility during a period of 519 days were gathered. The sample was one of convenience. The implications of this sample characteristic are discussed later.

Research Design

An interrupted time series design was used in this study. Data on adolescents' antisocial behavior were obtained for a 310-day period prior to the implementation of the ART program and then for a 209-day period after the program was started. This design used the 310 pretreatment daily rates of antisocial behavior as a control against which to compare the subsequent 209 daily rates obtained during implementation of the ART program (Cook & Campbell, 1979).

Treatment Program

The traditional ART curriculum was condensed into a 15-day program that was delivered to adolescents over a 21-day time period. The condensed ART curriculum included anger control training and social skills training, as described in Goldstein, Glick, Reiner, et al. (1987). The condensed ART program did not include any of the moral reasoning education that is typically a part of the curriculum. Previous experience with the moral reasoning component had suggested that it is difficult with this population of adolescents to put together the mix of adolescents needed for this group procedure to be effective.

All adolescents resident in the shelter participated in one ART group each day, with meetings lasting an hour to an hour-and-a-half. In these groups, anger control training and social skills training were conducted on alternating days. Group leaders used chapters three (social skills training) and five (anger control training) from Goldstein, Glick, Reiner, et al. as trainers' manuals. The full anger control sequence described in chapter five of Goldstein, Glick, Reiner, et al. was taught. The curriculum included training in the following six social skills described by Goldstein, Glick, Reiner, et al.: expressing a complaint, dealing with group pressure, responding to someone else's anger, keeping out of fights, dealing with an accusation, and responding to the

feelings of others. Group sizes ranged from about 7 to 10. Groups were led by shelter staff who had been trained in ART.

Data Analysis

A regression approach to time series analysis was used in the analyses described below. This approach to time series analysis is rather flexible in terms of its ability to test structural time series models (Harvey, 1990, 1993; Ostrom, 1990). Autoregressive (AR) models were used to represent the structure of autocorrelation in residuals. Autocorrelation, a common problem in analyses of time series data, can lead to biased tests of statistical significance (Cook & Campbell, 1979). This regression approach, described by Gottman (1981) and similar to the methods described by Ostrom (1990) and Harvey (1990), combined AR(p) (i.e., autoregressive of order p) least-squares and Box-Jenkins (Box & Jenkins, 1976) methods to determine the most appropriate autoregressive model for representing the autocorrelation structure in the residuals and for producing reliable statistical tests.

Outcome Measures

The dependent variables in this study were the male daily rate of antisocial behavior and the female daily rate of antisocial behavior. *Antisocial behavior* was defined as any behavior that would be considered to be: (a) a violation of rules and/or behavioral guidelines of the shelter, (b) a violation of legal or social norms, (c) a violation of another person's personal property, or (d) would be considered as aggression toward another person's physical or emotional well-being. The male rate of antisocial behavior was defined as the daily number of antisocial behavior incidents per male resident. The female rate of antisocial behavior was defined as the daily number of antisocial behavior incidents per female resident. The rate of antisocial behavior is a common outcome measure used in research on antisocial youth (Elliott, Huizinga, & Menard, 1989).

The case files of each adolescent residing in the shelter during the 519-day period were examined by two case file reviewers: reviewers A and B. Each reviewer examined different case files. Reviewer A examined 350 and reviewer B examined 172. In the language of generalizability theory (Cronbach, Gleser, Nanda, & Rajaratnam, 1972; Shavelson, Webb, & Rowley, 1989), this measurement procedure was a "raters nested within case files (or subjects)" design (Brennan, 1983). Each antisocial behavior incident recorded in an adolescent's case file and the date that it occurred were recorded by the reviewers. These incidents were then aggregated across

adolescents by date of occurrence so as to arrive at a total number of antisocial behavior incidents for each of the 519 days covered in this study. The daily totals for males and females were divided, respectively, by the total numbers of males and females resident in the shelter each day to obtain the two outcome measures. The numbers of males and females resident in the shelter each day were obtained from shelter census records.

Control Variables

Several control variables were included in the regression model. Included among these variables were the number of males and number of females residing in the facility each day. Lagged values of these variables were also included to control for possible temporal effects that changes in the numbers of males and/or females might have on the rates of male and female antisocial behavior (Harvey, 1990; Ostrom, 1990).

Previous daily rates of male antisocial behavior and previous daily rates of female antisocial behavior were also included. Lagged values of the observed daily rate of male antisocial behavior were used when the female daily rate of antisocial behavior was the dependent variable, and lagged values of the observed daily rate of female antisocial behavior were used when the male daily rate of antisocial behavior was the dependent variable. This controlled statistically, to some extent, for the recent history of antisocial behavior in the shelter (Green, 1993).

Lagged values of the predicted daily rate of male antisocial behavior (predicted linearly from the number of males in the shelter and the number of antisocial behavior incidents committed by males) were used when the dependent variable was the current daily rate of male antisocial behavior. Lagged values of the predicted daily rate of female antisocial behavior (predicted linearly from the number of females in the shelter and the number of antisocial behavior incidents committed by females) were used when the dependent variable was the current daily rate of female antisocial behavior. These procedures, described by Ostrom (1990), help control for the recent history of male and female antisocial behavior in the shelter and, yet, avoids the biased parameter estimates that result when lagged values of a dependent variable are used as predictors of a current value of the dependent variable.

As discussed by Green (1993), the number of lags (i.e., the number of previous days covered by the lagged variables) must be determined empirically. In the analyses discussed below, lags of 7 days were used in preliminary analyses. The number of lags used was then reduced until all nonsignificant lags were eliminated.

Moderating Variables

Research has suggested that males and females have different rates and types of antisocial behavior (Kazdin, 1995; Tremblay, Masse, Pagani, & Vitaro, 1996), and there is evidence that gender may moderate the effects of some interventions for children and adolescents (see, for example, Kellam & Rebok, 1992). Clearly, as the number of males and/or females residing in the shelter increased, the potential for a more chaotic shelter environment increased. Anecdotal reports from shelter staff were consistent with this speculation. For example, shelter staff reported that when many adolescents were living in the shelter, staff were more frequently required to manage problematic situations between adolescents. These considerations led us to speculate that the effect of ART on antisocial behavior in the shelter may depend on the numbers of males and females living there at any given point in time.

Hence, the interactions between treatment condition (pre-ART and ART) and number of male and number of female adolescents resident in the shelter were tested for statistical significance. A statistically significant interaction would be consistent with the possibility that the variable involved in the interaction with the treatment condition was a treatment moderator (Neter, Wasserman, & Kutner, 1983).

Type I Error Control

A total of six statistical tests were relevant for the tests of effects of the ART program on either daily rate of male antisocial behavior or daily rate of female antisocial behavior. There were four tests of interactions, and if interactions were statistically nonsignificant, two possible tests of main effects. The Bonferroni inequality was used to set a test-wise critical alpha of $.10/6 = .0167$, giving an overall Type I error rate over the six possible tests of less than .10 (Stevens, 1986). Because research questions a and b implied directional main effects (i.e., reductions in rates of antisocial behavior), these were tested in one-tailed tests of statistical significance (Chow, 1996). Interactions were tested in two-tailed tests.

RESULTS

A total of 522 adolescents went through the residential program during the 519 days of this study. The mean age of these adolescents was 14.9 ($SD = 1.5$, range 11 to 17), and 54% of them were female. About 55% of these

adolescents were in custody of their parents, 38% were in custody of the State of Tennessee, and the remainder were in custody of other persons, such as their grandparents or other relatives. About 77% of these adolescents were White, about 18.4% were African American, 2.5% were Latino, .4% Asian American, and the remainder were from other minority groups. The mean number of adolescents in the facility each day was 13 ($SD = 2.07$; range 8 to 19); the mean daily number of males in the facility was 7.27 ($SD = 1.6$; range 3 to 12), and the mean daily number of females was 5.73 ($SD = 1.7$; range 1 to 11).

The weekly numbers of antisocial behavior incidents as a function of study phase (pre-ART or ART) are shown in Figure 1 for males and Figure 2 for females. The horizontal lines indicate phase means. The pre-ART phase mean weekly number of male antisocial behavior incidents was 28.4, and the ART period mean was 24.4. This decrease represents a $(28.4 - 24.4)/28.4 \times 100\% = 14\%$ decrease. The pre-ART phase mean weekly number of female antisocial behavior incidents was 17, and the ART period mean was 12. This decrease represents a $(17 - 12)/17 \times 100\% = 29.4\%$ decrease. Weekly numbers of antisocial behavior incidents are shown, as opposed to daily numbers, to facilitate presentation. The presentation of daily numbers would have crowded 519 data points into the figure.

Assessment of Time Series Analysis Assumptions

The time series methods used in this study assume *weak stationarity* (Cromwell, Labys, & Terraza, 1994; Gottman, 1981). The assumption of weak stationarity states that the mean, the variance, and the autocorrelation function for the time series are all constant across time. The plausibility of this assumption was tested in several ways, as suggested by Gottman (1981) and Cromwell et al., (1994), and all results were consistent with the assumption of weak stationarity.

Reliability Analysis

Following Kazdin (1982), multiple methods were used to assess the reliability of the data from the case file review. Using procedures described in detail by Nugent et al. (1998), the interrater agreement of counts of numbers of antisocial behavior incidents obtained from adolescents' case files was estimated to be .803, with an approximate 99% confidence interval of .77 to .84 (Scheaffer, Mendenhall, & Ott, 1996).

Generalizability theory methods (Brennan, 1983; Cronbach et al., 1972; Nugent, 1994; Shavelson et al., 1989) were also used to estimate reliability. The generalizability coefficient estimating the reliability of ratings of numbers

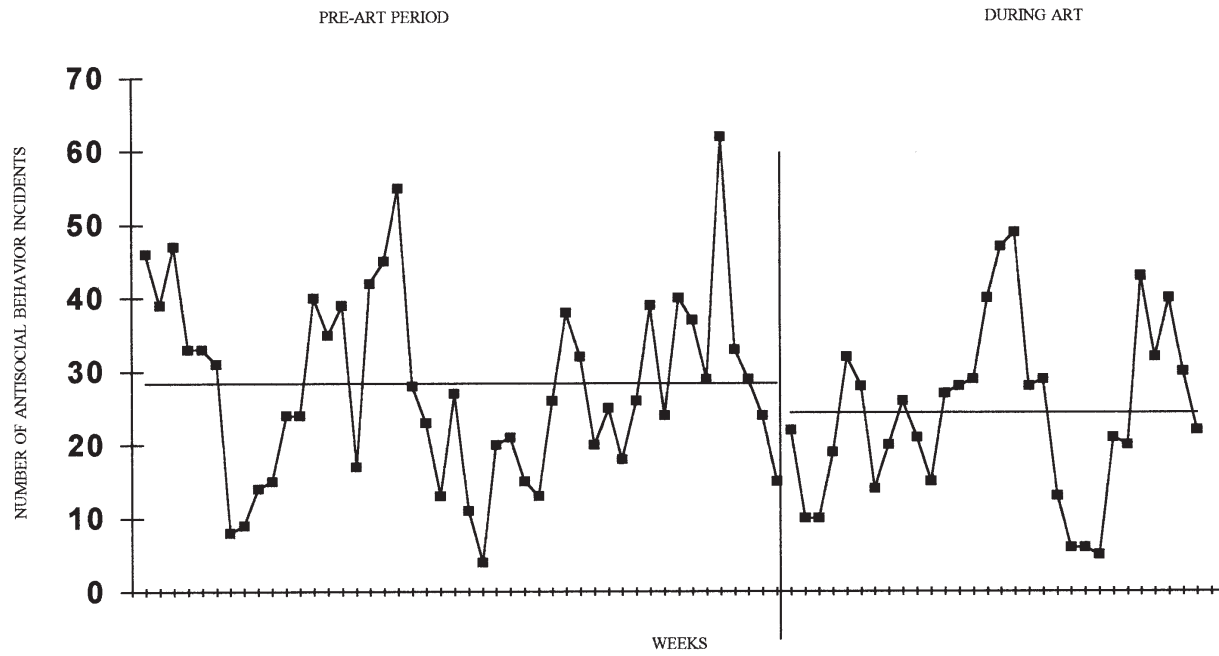


Figure 1: Weekly number of male antisocial behavior incidents as a function of study phase. Horizontal lines indicate phase means.

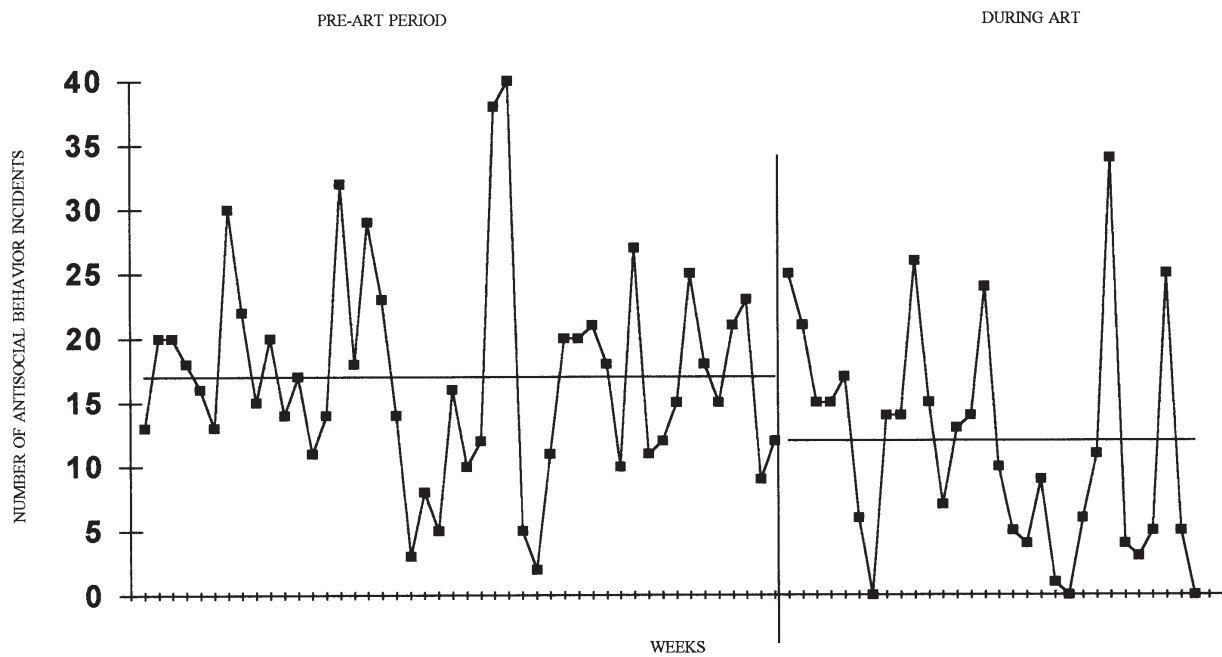


Figure 2: Weekly number of female antisocial behavior incidents as a function of study phase. Horizontal lines indicate phase means.

of antisocial behavior incidents drawn from the case files in this research was .96. An alternate approach that produces an intraclass correlation that serves as an estimate of interrater reliability (Ebel, 1951; Lahey, Downey, & Saal, 1983; Tinsley & Weiss, 1975) led to an estimated reliability of .96, with an approximate 99% confidence interval of .94 to .97.

A reliability analysis using generalizability methods was also conducted on the daily counts of the number of antisocial behavior incidents in the facility. The generalizability coefficient describing the reliability of daily counts of antisocial behavior incidents made by a single rater was .78. The alternate approach used to compute an intraclass correlation led to an estimated reliability of .78, with an approximate 99% confidence interval of .68 to .85.

These estimates of the reliability of the daily counts of antisocial behavior incidents are most likely underestimates. The reliability sample was more homogeneous with respect to daily numbers of antisocial behavior incidents (mean = 2.5, $SD = 2.02$) than was the sample of daily counts from 522 adolescents during 519 days (mean = 6, $SD = 4.19$). This restriction of range in the reliability study sample leads to a low estimate of the universe score variance of the daily counts, which results in a low generalizability coefficient estimate. This is the same problem encountered when estimating a classical reliability coefficient with a homogeneous sample of scores.

Kazdin (1982) also discussed the need to assess the possibility of rater bias. Two approaches were employed to assess the likelihood that case file reviewers in this study produced systematically biased case file reviews: ordinary least squares (OLS) regression methods and hierarchical linear modeling (HLM) (Bryk & Raudenbush, 1992) methods. Results of both OLS regression methods and HLM methods were consistent with a lack of bias in case reviews (see Nugent et al., 1998, for details).

Effects on Rate of Female Antisocial Behavior

The autocorrelation function for the residuals from an OLS regression time series model in which lags of control variables covering 3 days were used showed a complex pattern of significant autocorrelations across 72 lags, with significant positive spikes at lags 3, 5, and 6, and significant negative spikes at lags 16 and 36. The partial autocorrelation function showed significant positive spikes at lags 3, 5, and 6, and negative spikes at lags 9, 11, and 36. The chi-square test for white noise in the residuals was significant across 6, $\chi^2(6) = 22.18, p = .001$; 12, $\chi^2(12) = 28.16, p = .005$; and 18, $\chi^2(18) = 35.3, p = .009$ lags. These results clearly suggested some pattern of autocorrelation in the residuals (Gottman, 1981; Harvey, 1990; Ostrom, 1990).

TABLE 1: Results of Analysis of Female Daily Rate of Antisocial Behavior

<i>Variable</i>	B	t	p
Number of males in shelter at time t	.01	.59	.55
Number of males in shelter at time t – 1	–.02	–.87	.38
Number of males in shelter at time t – 2	–.02	–.56	.58
Number of females in shelter at time t	–.01	–1.1	.28
Number of females in shelter at time t – 1	.06	3.01	.003
Number of females in shelter at time t – 2	–.07	–2.30	.02
Rate of male antisocial behavior at time t – 1	–.01	–.12	.91
Rate of male antisocial behavior at time t – 2	.05	.95	.34
Predicted rate of female antisocial behavior at time t – 1	.01	.04	.97
Predicted rate of female antisocial behavior at time t – 2	.08	1.19	.24
Aggression replacement training	–.16	–2.30	.012*
Lag-1 autocorrelation parameter	.22	2.42	.016
Lag-3 autocorrelation parameter	.15	3.51	.001
Lag-5 autocorrelation parameter	.14	3.08	.003
Lag-9 autocorrelation parameter	–.10	2.37	.018
Constant	.50	2.27	.024

NOTE: time t = current day; time t – 1 = previous day; time t – 2 = two days prior to current day.

*One-tailed test of significance

The results of fitting a ninth-order autoregressive model to the residuals suggested that a model with lag-one, lag-three, lag-five, and lag-nine parameters would adequately represent the autoregressive structure in the residuals. The autocorrelation and partial autocorrelation functions for residuals from the regression model incorporating this autoregressive error structure, as well as chi-square tests for white noise, all suggested that this autoregressive model adequately represented the autocorrelation structure (Gottman, 1981; Harvey, 1990; Ostrom, 1990).

Both interaction terms testing for treatment moderators were nonsignificant. The results of this analysis for the main effect of the ART program on the female daily rate of antisocial behavior are shown in Table 1. As can be seen in this table, the implementation of the ART program, after controlling for covariates, was associated with a statistically significant decrease in daily rate of female antisocial behavior of about 32%.

Effects on Rate of Male Antisocial Behavior

The autocorrelation function for the residuals from an OLS regression time series model in which lags of control variables covered 3 days showed only three significant autocorrelations across 72 lags. The partial autocorrelation function showed a significant negative spike at lag 24. Whereas the number of significant autocorrelations and partial autocorrelations were consistent with the number expected by chance, chi-square tests for white noise in the residuals were significant across 24, $\chi^2(24) = 39.05, p = .027$; and 30, $\chi^2(30) = 44.69, p = .041$, lags. These results suggested the possibility of some significant autocorrelation process in the residuals (Gottman, 1981; Harvey, 1990; Ostrom, 1990).

The results of fitting a large-order autoregressive model to the error structure suggested that an autoregressive model with a lag-one parameter would adequately represent the error structure. The autocorrelation and partial autocorrelation functions for residuals from this regression model with an AR(1) error structure, as well as chi-square tests for white noise, all suggested that the AR(1) model adequately represented the autocorrelation structure in the residuals.

The interaction between treatment condition and number of males in the shelter was statistically significant. The results of the analysis of the male daily rate data are shown in Table 2. These results suggested that the effect of the ART program on the daily rate of male antisocial behavior depended on the number of males in the facility. The differential treatment effect can be illustrated by considering the rate of change of the treatment effect as a function of the number of males in the shelter. This relationship is given for the results in Table 2 by the equation

$$\partial(\text{RMASB}) / \partial(\text{ART}) = -1.3 + (.15 \times N_m),$$

where RMASB = male daily rate of antisocial behavior, and where N_m = number of males currently in the shelter (Neter et al., 1983).

As can be seen from this equation, the reduction in male rate of antisocial behavior associated with the ART program becomes less as the number of males currently in the shelter increases. According to this equation, the ART program was associated with a reduction in the rate of male antisocial behavior when there were less than 9 males resident in the shelter.

TABLE 2: Results of Analysis of Male Daily Rate of Antisocial Behavior

<i>Variable</i>	B	t	p
Number of males in shelter at time t	-.03	-2.10	.04
Number of males in shelter at time t - 1	.07	3.10	.002
Number of males in shelter at time t - 2	-.06	-2.70	.008
Number of females in shelter at time t	-.00	-.03	.97
Number of females in shelter at time t - 1	-.01	-.30	.76
Number of females in shelter at time t - 2	-.02	-.84	.40
Rate of female antisocial behavior at time t - 1	-.00	-.04	.96
Rate of male antisocial behavior at time t - 2	.05	1.39	.17
Predicted rate of male antisocial behavior at time t - 1	-.36	-4.30	.001
Predicted rate of male antisocial behavior at time t - 2	.13	3.48	.001
Aggressive replacement training (ART)	-1.3	-3.40	.001
Number of males in shelter at time t by ART interaction	.15	3.60	.001
Number of females in shelter at time t by ART interaction	.01	.39	.70
Lag-1 autocorrelation parameter	.57	9.10	.001
Constant	.50	2.27	.024

NOTE: time t = current day; time t - 1 = previous day; time t - 2 = two days prior to current day.

DISCUSSION AND APPLICATIONS TO SOCIAL WORK PRACTICE

The results of this study need to be considered in context of several methodological limitations. First, the study did not use an experimental design, so inferences of causality should be made with caution. Although the recent history of male and female antisocial behavior in the facility as well as the recent history of numbers of males and females in the shelter were controlled statistically, there are numerous other variables that were not controlled that could have had an effect on the rates of male and female antisocial behavior.

One threat to internal validity that deserves special note is the possibility that shelter staff unknowingly changed their definitions of antisocial

behavior during the ART phase of the study and/or changed how they recorded these behaviors. Shelter staff were all trained in the ART program a short time before it was implemented. This training could have changed how shelter staff interpreted resident adolescents' behavior, thereby leading to a change in the numbers of behaviors recorded in case files and, hence, a spurious finding of a decrease in female rate of antisocial behavior concomitant with the start of the ART program. Although there is no evidence that this occurred, there is no way to rule it out with the data obtained in this study.

A similar possibility concerns how agency staff recorded male antisocial behavior incidents in case files. The possibility exists that when there were more males resident in the shelter, the agency staff saw more antisocial behavior incidents involving males than actually occurred. The greater the number of males in the facility, the more likely it would be that problems arose that had to be dealt with by staff. This temporary increase in client management chores might have led staff to unknowingly change the definition of behaviors that would merit a write-up in an adolescent's case file. Such a change in recording practices could have led to the finding that the ART program was less effective in reducing male antisocial behavior when there were more males in the facility. Although there was no evidence that this occurred, the design of the study did not allow us to rule out such a change in recording.

A final limitation concerns the sample of adolescents involved in this study. The sample of convenience that was used makes it difficult to generalize the results to other groups of adolescents. Replications of this research need to be conducted with both similar and dissimilar groups of adolescents to establish the extent to which the results of this study are generalizable (Kazdin, 1982).

The results of this study were consistent with previous research conducted on the ART program that has shown it to be a promising intervention for aggressive and antisocial behavior. The results of this study suggested that ART may decrease male and female antisocial behavior in the context of a short-term residential setting. The results of this study extended those of previous research by demonstrating that the ART program can be condensed into a form that is appropriate for short-term residential settings. The results further extend those of previous research by suggesting that the ART program may be: (a) more effective in reducing male antisocial behavior when there are smaller numbers of males living in the facility and (b) effective in reducing female antisocial behavior regardless of the numbers of males and females resident in a facility. However, the results of this study are best viewed as tentative, and future research on the ART program needs to look closely at the potential moderating effects of the numbers of males and females resident in a short-term facility.

The results of this study, along with the results of the studies reviewed earlier, support the use of ART in social work practice in both short- and long-term residential settings. Social workers may want to consider adding new components to the ART curriculum. Goldstein et al. (1987) has suggested that two additions that may function to increase the potency of the ART program are empathy skills training and problem-solving skills training. The ART program can be thought of as a promising intervention for antisocial behavior that is in the process of development and may be used as one part of a larger treatment package for antisocial behavior problems.

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