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**ABSTRACT**

Effective Classroom Management II-Elementary (ECM), an in-service teacher training course, was evaluated. Grade 5 teachers were taught techniques in communication, classroom management, and self-esteem enhancement. The goals were to make classroom environments more responsive to students' affective and cognitive needs, thereby fostering positive attitudes, behaviors, and norms regarding self, peers, and school. These changes were expected to reduce, in subsequent years, student acceptance and use of psychoactive substances. Process data included (1) teacher feedback on each training session, (2) surveys of teachers at the end of training and at the end of the school year, and (3) observations of classroom implementation. Pre- and posttests were administered to students and teachers, student achievement and attendance data were gathered, and teachers rated students' classroom behavior. Analyses of covariance revealed no predicted treatment effects on teacher outcomes. Analyses of covariance conducted on the class-level student data did not reveal a coherent pattern of treatment effects for comparisons of all control classes with all experimental classes, or with those experimental classes whose teachers completed ECM. For female students no significant effects were found; for males, significant positive treatment effects were found on reading achievement, perceived costs of alcohol use, and perceived costs of marijuana use. These latter effects were attributed to school differences or Type I error. The lack of treatment effects was discussed in terms of possible problems with treatment implementation. (Author/GK)

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THE EFFECTS OF A CLASSROOM MANAGEMENT  
TEACHER TRAINING PRIMARY PREVENTION PROGRAM  
ON FIFTH-GRADE STUDENTS

SUBMITTED TO  
NATIONAL INSTITUTE ON DRUG ABUSE  
PREVENTION BRANCH

JULY, 1981.

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## ABSTRACT

Effective Classroom Management II-Elementary (ECM), an in-service teacher training course, was evaluated. In this course, 5th grade teachers were taught techniques in communication, classroom management, and self-esteem enhancement. The goals of the course were to make classroom environments more responsive to students' affective and cognitive needs, thereby fostering positive attitudes, behaviors, and norms regarding self, peers, and school. These changes were expected to reduce, in subsequent years, student acceptance and use of psychoactive substances.

Schools were paired on the basis of student characteristics, and one school from each pair was randomly assigned to either the experimental or control condition. The experimental group consisted of 11 classes, but only seven of these classes had teachers who received the training. There were 11 control classes with teachers who received no training.

The ECM in-service training consisted of ten two-hour sessions held weekly after school hours. Also, the trainer visited each teacher's classroom on at least four occasions to observe and guide implementation of the ECM techniques.

Process data included a) teacher feedback on each training session, b) surveys of teachers at the end of training and at the end of the school year, and c) observations of classroom implementation. The training was highly regarded by the teachers, the teachers used the skills competently, and they found almost all of the techniques quite useful. The teachers varied considerably in how often they used the techniques.

Pre- and posttests were administered to students and teachers in the study. Student achievement and attendance data were gathered from school district records. Teachers also rated their students' classroom behavior.

Analyses of covariance revealed no predicted treatment effects on teacher outcomes.

Analyses of covariance conducted on the class-level student data did not reveal a coherent pattern of treatment effects for comparisons of all control classes with a) all experimental classes or b) those experimental classes whose teachers completed ECM. For female students no significant effects were found. For male students significant positive treatment effects were found on reading achievement, perceived costs of alcohol use, and perceived costs of marijuana use. These latter effects were considered spurious and attributed to school differences or Type I error. The lack of treatment effects was discussed in terms of possible problems with treatment implementation.

## INTRODUCTION

Effective Classroom Management II<sup>1</sup>-Elementary (henceforth called ECM) is an in-service teacher training course. It focuses on affective teaching techniques typical of courses currently provided by primary prevention programs. In the ECM course, teachers are taught techniques in communication, classroom management, and self-esteem enhancement. They are also assisted in applying the skills while teaching the regular academic curriculum. The general goals of the course are to make classroom environments more responsive to students' affective and cognitive needs. The course is designed to foster positive student attitudes, behaviors, and norms regarding self, peers, and school; and to reduce in subsequent years students' acceptance and use of psychoactive substances.

An earlier version of the ECM course was taught and evaluated in the year prior to this study (Schaps, Moskowitz, Condon, and Malvin, Note 1). Only small, nonsignificant effects of the treatment on teachers and students were found. However, the analyses may not have adjusted adequately for initial differences that existed between the experimental and control students and teachers. Furthermore, the process evaluation revealed poor implementation of a major component of the curriculum, problem solving skills.

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<sup>1</sup>The "II" refers to the second version of the course.

The research design and training curriculum of the present study benefited in two ways from knowledge obtained in the earlier study. The present study employed a larger number of schools (13 vs. 8) with fewer teachers per school included in the study. Also, the present curriculum substituted classroom management skills for problem solving skills.

The revised ECM training curriculum was eclectic. It included techniques developed by Thomas Gordon (reflecting feelings and content; I-messages), Louis Rath (clarifying responses), Jack Canfield (self-esteem enhancement activities), Rudolph Dreikurs and William Glasser (classroom management techniques). The curriculum did not directly address substance use, except for one presentation on the links between substance abuse and attitudes (e.g., low self-esteem, negative attitudes toward school) and behaviors (e.g., poor academic performance, high absenteeism). The curriculum offered no information about psychoactive substances and gave no advice on how to handle substance abuse problems per se. Detailed documentation of the course curriculum is available (Adams & Slimmon, Note 2).

Many primary prevention programs have been offering affective teacher training courses similar to ECM. There have been state-wide programs in Michigan (Michigan Department of Education, Note 3), Georgia (Georgia Department of Human Resources, Note 4), and Pennsylvania (Randt, Hammond, Wisdo, & Mitzel, Note 5). Affective teacher training programs have been shown to be effective at improving peer relationships, classroom discipline, attitudes toward school, and academic achievement (Baskin and Hess, 1980). A recent review of prevention program evaluations suggested that training "significant others" (e.g., parents, teachers) in affective skills may be an effective approach to prevention (Schaps, DiBartolo, Moskowitz, Palley & Churgin, 1981).

In the present study, ECM was provided to eight 5th grade teachers in five elementary schools during the 1979-80 school year. The teachers applied skills in their classrooms under the guidance of the in-service trainers. The teachers, then, were the critical links in the delivery of the intervention; the adequacy of the treatment depended upon teachers' use of the skills. Consequently, teachers' reactions to the training and their use of the ECM skills were closely monitored.

The impact of ECM on both the teachers and their students was assessed. Three teacher outcome variables were measured: the importance of, and effectiveness at, achieving the objectives of the ECM training; satisfaction with teaching; and perceived faculty cohesiveness. We hypothesized that ECM would impact all three of these outcome variables.

Student outcome measures were locus of control, social self-esteem, academic self-esteem, attitudes toward peers, perceived classroom climate, attitudes toward school, perceived peer attitudes toward school, total absences, unexcused absences, reading achievement, math achievement, and teacher ratings of student behavior in school. Drug-specific outcome measures were perceived positive and negative consequences of tobacco, alcohol, and marijuana use; and involvement in use of each of these substances. Among these variables, we hypothesized that ECM would be most likely to impact perceived classroom climate, attitudes toward school, social self-esteem, and behavior ratings because the in-service skills bear most directly on these variables. We also anticipated that ECM would impact other variables less directly. Among these other variables, we expected that the drug-specific measures would be least likely to show an effect, due to the low level of drug involvement at these ages and the limited duration of the intervention. The present study will be continued for an additional year.

## OUTCOME METHOD

### Assignment of Schools to Condition

Thirteen elementary schools (grades K-6) from a predominantly white, middle-class, suburban public school system in Northern California were paired based upon characteristics of their students. One school from each pair was assigned randomly to the experimental condition and the other to the control condition.<sup>2</sup> Table 1 shows the school means and standard deviations of the measures employed in matching the schools for each condition. The measures for each school were a) total student enrollment prior to the study; b) the percentage of students from families receiving Aid for Families with Dependent Children (AFDC); c) the percentage of students classified as Spanish-speaking with either limited or no English language skills; d) the average number of unexcused absences per student during the school year; and e) an estimate of the student body's socioeconomic status (made by a school district official).

### Subjects

All Grade 5 and combined grade 5-6 students and their 12 teachers in the six experimental schools constituted the experimental group.<sup>3</sup> Eight

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<sup>2</sup>Since an odd number of schools existed, one triplet was formed from which one school was randomly assigned to the experimental condition and the other two to the control condition.

<sup>3</sup>Two experimental and three control combined grade 4-5 classes were not included in the study because they were part of another study.

of the teachers from five experimental schools completed the ECM in-service training.<sup>4</sup> One male and seven female teachers completed the training; the four nonparticipating teachers were males. The control group consisted of all grade 5 students and combined grade 5-6 students and their 11 teachers (seven females and four males) in the seven control schools. Both the experimental and control conditions contained 11 classrooms; seven grade 5 classes and four grade 5-6 classes.

Initially, there were 266 experimental students and 270 control students. However, 46 experimental students and 49 control students were excluded due to attrition or parental objections to their participation in the research. The experimental group consisted of 82 males and 138 females,<sup>5</sup> and the control group consisted of 115 males and 106 females. The ethnic composition was 90% ( $N = 396$ ) White and 10% ( $N = 45$ ) minority with Mexican-American 5% ( $N = 22$ ) comprising the largest minority group.

#### In-Service Training Program

The ECM in-service program consisted of ten, two-hour sessions held weekly after school. There were also two "reunion" sessions between November 1979 and February 1980. The teachers were paid \$200 for attending the voluntary sessions and trying to apply the in-service skills in their classrooms. They also were offered graduate-level credit from a local university for completing the training.

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<sup>4</sup>Two of the participating teachers taught half-time in the same class; thus, seven classes had participating teachers.

<sup>5</sup>29 males and 47 females were enrolled in classrooms with nonparticipating experimental teachers.



TABLE 1

## EQUIVALENCE OF EXPERIMENTAL AND CONTROL SCHOOLS

	<u>Experimental Schools (N=6)</u>		<u>Control Schools (N=7)</u>	
	<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>
Total School Enrollment	340	130	294	49
Percent of Enrollment Receiving AFDC	13.0	8.0	11.6	10.4
Percent of Spanish-Speaking	2.3	3.2	1.5	3.1
Average Number of Unexcused Absences per Pupil	2.0	0.3	1.8	0.9
Socioeconomic Status Rating	46.7	34.2	47.1	30.1

A trainer observed the teachers in their classrooms at least four times. These visits began during the training and continued until May 1980. After each visit, the trainer met briefly with the teacher to provide feedback on classroom behaviors.

Both trainers had experience conducting in-service programs for teachers. They also had experience as classroom teachers and as school administrators, and had taught many of the ECM skills in previous training programs.

Most of the training sessions followed a standard format. First, a self-concept enhancement technique or activity was introduced. Then the skills learned in prior sessions were reviewed at length, along with the teachers' experiences using the skills during the previous week. Finally, a new skill was introduced and practiced.

Four communication techniques were taught during the first five training sessions:

- I-Messages--a technique for effectively communicating the impact of another's behavior upon oneself;
- Clarifying Responses--brief questions and comments by which a listener can prompt further thinking by a speaker;
- Reflecting Feelings--techniques that enable a listener to indicate acceptance and accurate understanding of the speaker's feelings; and
- Reflecting Content--techniques that enable a listener to show interest and to indicate understanding of the speaker's message.

In the next three sessions, teachers were taught a sequence of classroom management skills for minimizing and handling discipline problems. Techniques were taught for effectively communicating expectations and establishing classroom rules. In addition, skills were taught for managing discipline problems and for rewarding desired behaviors. These skills

included systematic positive reinforcement of appropriate student behavior:

- Positive Verbal Feedback (e.g., praise);
- Positive Nonverbal Cues (e.g., smile, nod); and
- Tangible Reinforcers (e.g., token system);

and systematic discipline of inappropriate behavior:

- Negative Verbal Feedback (e.g., request for behavioral change);
- Negative Nonverbal Cues (e.g., eye contact, touch); and
- Time-out (e.g., isolation).

Activities to enhance student self-concept were introduced at nine of the sessions and were the major component of the last two sessions. Classroom activities were taught that facilitate classroom discussion of students' experiences, talents, and achievements, and that elicit positive feedback from peers. Another approach to self-concept improvement included modifying the regular curriculum to help students organize their work, assist each other, and gain recognition for their efforts.

Student self-report outcome data. Student data at pretest were obtained with an instrument developed for this study called the Student Questionnaire. This instrument consists of two parts. Part 1 contains 18 items selected from the Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky, & Crandall, 1965). Selection of items was based upon published psychometric properties. Four items referring to "parents" were adapted to read "an adult who knows you" in order to conform to California Education Code.<sup>6</sup> This questionnaire

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<sup>6</sup>California Education Code requires that active parental permission be secured before requesting information about family life. This study employed passive consent procedures.

measures the belief in one's own control over, and responsibility for, intellectual-academic successes and failures. Part 2 contains three set of items: a) the Scholastic subscale from the Intermediate Level of the Self Appraisal Inventory (20 items) (Instructional Objectives Exchange, Note 6), a criterion-referenced measure of academic self-esteem; b) the Authority and Control (12 items) and Interpersonal Relationships With Pupils (12 items) subscales from the Intermediate-Level of the School Sentiment Index (Instructional Objectives Exchange, Note 7), a criterion-referenced measure of attitudes toward school; and c) a measure of perceived peer attitudes toward school developed for this study by adapting 11 items from eight instruments that measure attitudes toward school.

Student pretest data were also obtained with the Self Observation Scales (Intermediate Level, Form C) developed by Stenner and Katzenmeyer (Note 8). This instrument measures the ways children perceive their social and academic selves and their relationship to peers, teachers, and school. Students respond "yes" or "no" to 60 statements.

Drug-related pretest data were collected using the My Opinion Survey. This instrument was developed for this study to assess student opinions of each of the three "gateway" drugs, alcohol, cigarettes, and marijuana. Specifically, students were asked about perceived positive and negative consequences from use of the drug, their lifetime use, their current use ("last four weeks"), their attitudes toward use, their perceptions of peers' attitudes toward use ("most kids in my class"), and their perceptions of peer use.

The pretest measures used in the data analysis were derived from empirical scaling.<sup>7</sup> Pretest data were collected from a large sample of students in grades 3-6. Samples were selected from each grade level. Item means, variances, and intercorrelations were found to be similar across grade levels; thus, scaling procedures were applied across grades. Item intercorrelations from the pretest data were subjected to separate multiple group confirmatory factor analyses.<sup>8</sup> The resultant pretest scales appear in Table 2 with the number of items contained in each, and their internal consistency reliabilities estimated by coefficient alpha. The final scales included measures of affective teaching climate, attitudes toward school, social self-esteem, attitudes toward peers, locus of control for success, locus of control for failure, academic self-esteem, perceived peer attitudes toward school, perceived costs of and involvement in alcohol, cigarette, and marijuana use. The involvement scales were comprised of items measuring own use and attitudes, and perceived use and attitudes.<sup>9</sup>

Posttest data were obtained with revised versions of the Student Questionnaire and the My Opinion Survey. The revised instruments included the items in the final pretest measures. In addition, the locus of control for success scale contained five extra items and the failure scale contained three extra items from the original instrument.

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<sup>7</sup>The details of the scaling have been reported by Moskowitz, Condon, Brewer, Schaps & Malvin, Note 9.

<sup>8</sup>The matrices were computed using pairwise deletion of missing values and communalities were inserted into their diagonal elements.

<sup>9</sup>For each substance, the five component items exhibited good internal and external consistency, providing support for a single unidimensional construct. The positive relationships between the perceived peer measures and the own use and attitude measures indicate that students' own use and attitudes parallel their peers', or that they project their own use and attitudes onto their peers.

TABLE 2  
STUDENT SCALES, NUMBER OF ITEMS AND PRETEST  
INTERNAL CONSISTENCY RELIABILITIES (COEFFICIENT ALPHA)

<u>Subscale</u>	<u>N</u>	<u>Number of Items</u>	<u>Pretest Reliability</u>
Affective Teaching Climate (Affec Climate)	513	17	.91
Attitudes Toward School (Att School)	513	6	.74
Social Self-Esteem (Social Self)	513	6	.66
Attitudes Toward Peers (Att Peers)	513	8	.80
Locus of Control: Success (Control Suc)	513	7	.56
Locus of Control: Failure (Control Fail)	513	7	.62
Academic Self-Esteem (Acad Self)	513	11	.79
Perceived Peer Attitudes Toward School (Peer Att Sch)	513	8	.72
Perceived Costs of Alcohol Use (Alc Costs)	386	5	.70
Perceived Costs of Cigarette Use (Cig Costs)	386	5	.63
Perceived Costs of Marijuana Use (Pot Costs)	386	5	.67
Involvement in Alcohol Use (Alc Involve)	386	5	.77
Involvement in Cigarette Use (Cig Involve)	386	5	.75
Involvement in Marijuana Use (Pot Involve)	386	5	.84

Student archival outcome data. In addition to the student self-report data, we used achievement data collected by the school district. These data included the total reading (Read) and total mathematics (Math) stanine scores from the Stanford Achievement Test, Intermediate Levels I and II (Madden, Gardner, Rudman, Karlsen, Merwin, Note 10), administered in May 1979, and in May 1980, respectively.

Student attendance was measured in two ways. The total number of unexcused absences for the second semester (Unex Abs) was obtained for each student from the school district's records. This type of absence occurred when a student was absent from school and did not provide the school with a parental excuse stating that the student was sick. In addition, the average monthly number of absences for each student (Total Abs) during the fifth through eighth school months (January through April) was extracted from teachers' records by project staff. Both measures were obtained for Spring 1979 and Spring 1980.

Students' sex and ethnicity were determined from school district records.

Teacher data on student behavior. Teacher ratings of student misbehavior were obtained at pretest and posttest with the Student Behavior Report.<sup>10</sup> Using the class roster, each teacher indicated how frequently each child had been a minor (Minor) and major (Major) discipline problem during the previous four months (January through April). A five-point scale was used that ranged from "never" to "about once a day or more."

To determine whether experimental and control teachers used the "minor" and "major" categories in the same manner, teachers rated 17 hypothetical student behaviors as either a) not a discipline problem, b) a minor problem

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<sup>10</sup>The teachers who provided the pretest data were the students' teachers in the prior year and not the teachers in the study.

or c) a major problem. The pretest data were invalid because most teachers did not follow the instructions; hence, instructions for the posttest were revised. Analysis of the posttest data indicated that experimental and control teachers employed similar definitions of minor and major discipline problems.

Teacher outcome data. The teacher's pretest and posttest self-report data were obtained with the Teacher Questionnaire which was developed for this study. This instrument measured a) teacher satisfaction, adapted from the Purdue Teacher Morale Inventory (Rempel and Bentley, 1964); b) faculty cohesiveness, adapted from the Teacher Cooperation Subscale of the Teacher Attitude and Classroom Climate Questionnaire (Kaufman, Semmel & Agard, Note 11) and from the Intimacy Subscale of the Organization Climate Description Questionnaire (Halpin and Croft, 1963); and c) the importance and effectiveness of achieving teaching objectives related to ECM, a measure developed for this study. Table 3 shows the number of items included in these scales and the pretest internal consistency reliabilities estimated by coefficient alpha for grade 3-6 teachers.<sup>11</sup>

#### Data Collection Procedures

Student survey. The student pretest was administered in May 1979 and the posttest in May 1980 by six substitute teachers. The Student Questionnaire and My Opinion Survey were administered at both times during two sessions in the students' classrooms. In addition, the Self Observation Scales were administered at the pretest during the first session. The students read the items to themselves (assisted by the administrator as necessary) except for the first

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<sup>11</sup>To increase the sample size, additional teachers were included in the scaling analysis.



TABLE 3

TEACHER SCALES, NUMBER OF ITEMS, AND PRETEST  
INTERNAL CONSISTENCY RELIABILITIES (COEFFICIENT ALPHA) (N=60)

<u>Scale</u>	<u>Number of Items</u>	<u>Pretest Reliability</u>
ECM Objectives	6	.76
Teacher Satisfaction	8	.80
Faculty Cohesiveness	7	.90

administration of the My Opinion Survey which was read to the students. One make up session was held for students who were absent from the original sessions.

In a prepared statement, administrators assured students of complete confidentiality. The confidentiality of the My Opinion Survey administration was enhanced by prelabeling questionnaires with student names on the cover sheet and students' school district identification numbers on page one. After receiving the questionnaire, students were instructed to tear off the cover page which displayed their names. Students were told of the need for identification numbers as a way of tracking students over time.

Teacher survey. Teachers completed the pretest teacher questionnaire at their school in September 1979. Teachers completed the posttest questionnaires in their classrooms while their students were being surveyed. To ensure the privacy of their responses, teachers were provided with questionnaires containing unique identifiers.

#### Data Analysis

Student data were analyzed in two ways.<sup>12</sup> The first approach examined differences between experimentals and controls. This approach grouped together all experimental students regardless of whether their teacher participated in the ECM training (35% of experimental students had teachers who did not participate). The analysis provides a conservative estimate of treatment effects because it assumes that all experimental students were treated. The advantages of this approach are a) that it preserves the experimental design,

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<sup>12</sup>A third approach, based on process data, attempted to relate a composite measure of treatment implementation to classroom mean student outcomes. This analysis was conducted only on participating teacher/classroom data and had too few cases to produce stable estimates. The pattern of results was not illuminating and has not been reported here.

allowing stronger inferences to be made from the data, and b) that the obtained results may be generalizable to a wider range of situations.

The second approach compared only the students of teachers who participated in the training with all control students. A problem with this approach is that observed effects may be due to selection and not the treatment. That is, participating teachers (and their students) are likely to be different from controls simply because they constitute a special group--teachers who chose to undertake and complete the training.

Least squares techniques assume that the units of analysis are statistically independent. The research design involved random assignment of schools to the experimental and control conditions. Within each school there was interdependence among classes as well as interdependence among the students within each class. Because the treatment was delivered by teachers to their classes, interdependence among students within classes was probably substantial; interdependence among classes within schools probably was not. Hence, we decided to aggregate the student data to the class-level and analyse the class-level data.

Classroom means were computed for pretest and posttest student measures separately for each sex. This approach allows control for, and examination of, relationship between student sex and treatment effects. Separate analyses were then conducted for males and females at each grade level to avoid problems with heterogeneity of variance and covariance.

Univariate analyses of variance and covariance were the primary analysis strategies. While multivariate analysis controls better for Type I error, it has several problems. Multivariate analysis generally has less statistical

power than univariate analysis when sample sizes are small. The effect of violations of the homogeneity of covariance assumption, which frequently occur, is not well understood. In addition, the selection of covariates in the multivariate analysis of covariance is constrained by the parallelism assumption; i.e., that the regression hyperplanes be parallel.

In the present study we have set the Type I error rate for each analysis at .05. If we require power (the likelihood of detecting a real effect) to be .80, ANOVA can detect an effect size as small as 1.2 SD.<sup>13</sup> With a pretest-posttest correlation of .45 (the median  $r$ ), ANCOVA can detect an effect size as small as 1.0 SD. Since we conducted many analyses, isolated effects must be interpreted cautiously because they may be due to experiment-wise Type I error. Interpretation of results is based on patterns in the data rather than single findings.

Rules were set for handling missing data in computing scale scores. A scale score was computed for a student if at least 60% of the items comprising that scale were present. Any missing item score was replaced by the mean for that item in the appropriate cell of the experimental design. This procedure utilized most of the item data and provided unbiased cell means. When more than 40% of the items comprising a scale were missing, the student received a missing value for that scale, and the case was not utilized in computing the class mean for that scale.

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<sup>13</sup>SD refers to the pooled-within group posttest standard deviation. Although the minimum effect sizes seem large, the standard deviation of class means is considerably smaller than the standard deviation of student scores. Therefore, the unstandardized effect sizes are comparable at both levels of analyses.

## PROCESS EVALUATION METHODS AND RESULTS

### Teacher Attendance at Training Sessions

Nine of the 12 experimental teachers signed up for the in-service training. Of these teachers, eight attended at least nine of the ten sessions, and thereby earned \$200 stipends. These teachers also attended two "reunion" sessions.

### Teacher Feedback on the Individual Training Sessions

At the end of each training session (except the final session), teachers were asked to complete a one-page "feedback form" anonymously. This form solicited ratings of, and comments about, the session. On the form, teachers rated each session in terms of interest, organization, usefulness, and enjoyableness, using five-point rating scales with higher numbers signifying more positive ratings.

Teachers rated all sessions favorably. Of the 36 separate ratings (four per session), 30 averaged above 4.5, and none averaged less than 4.1. The teachers frequently wrote compliments and rarely had critical comments.

### Questionnaire Surveys of Participating Teachers

At the completion of training (February 1980), and again near the end of the school year (May 1980), participating teachers in the experimental group completed questionnaires about their use of the ECM skills in their classrooms. Teachers reported how often they used each in-service skill, rated the usefulness of each skill, and rated their own mastery of each skill.

Table 4 summarizes the year-end data. The first four skills listed in Table 4 are the communication skills; the second six are classroom management skills; the last "skill"--self-concept enhancing activities--is a series of classroom exercises used apart from the teaching of the regular curriculum.

At the year-end, nearly all of the teachers reported using each of the four communication skills at least several times per week. On a daily basis, I-messages were most widely used and reflecting feelings and content were least used. With the exception of time-out and tangible reinforcers, most of the teachers reported using the classroom management skills at least several times per week. However, on a daily basis, only two of the six skills, positive nonverbal cues and positive verbal feedback, were widely used. Almost two-thirds of the teachers reported using self-concept enhancement activities on a weekly basis.

With regard to the usefulness of the skills, positive nonverbal cues and self-concept enhancement activities were considered most valuable, and tangible reinforcers and time-out least valuable. Thus, perceptions of utility corresponded strongly with reported use. The teachers generally rated their own mastery of the skills as "good," seeing themselves least adept at using time-out, I-messages and negative verbal feedback.

The mid-year questionnaire asked the teachers to evaluate the in-service course as a whole, using five-point rating scales. The teachers' ratings were extremely favorable with respect to interest ( $\bar{M} = 5.00$ ), organization ( $\bar{M} = 5.00$ ), usefulness ( $\bar{M} = 4.69$ ), and enjoyableness ( $\bar{M} = 4.88$ ). The teachers also rated the trainers highly.

TABLE 4

TEACHERS' REPORTS ON FREQUENCY, UTILITY, AND QUALITY OF SKILL IMPLEMENTATION (N = 8)  
AT THE END OF THE YEAR

In-Service Skill	Percentage of Teachers Using the Skill at Least:		Mean Ratings of Value of the Skill (5=High Utility; 1=Low Utility)	Mean Ratings of Mastery of Skill (4=Excellent; 1=Poor)
	Several Times per Week	Every Day		
I-Messages	75	63	4.25	2.63
Clarifying Responses	88	38	4.38	2.88
Reflecting Feelings	88	25	4.62	2.88
Reflecting Content	88	25	4.62	3.00
Positive Verbal Feedback	100	63	4.62	3.25
Positive Nonverbal Cues	100	88	4.75	3.38
Tangible Reinforcers	50	25	3.25	3.00 <sup>1</sup>
Negative Verbal Feedback	63	13	3.75	2.63
Negative Nonverbal Cues	100	38	4.38	3.14 <sup>1</sup>
Time-Out	25	0	2.88	2.43
Self-Concept Enhancement	63	25	4.75	3.00 <sup>1</sup>

<sup>1</sup>One teacher who did not use this skill is not included in this mean.

To summarize, data from the questionnaires indicate that teachers were using most skills on a regular basis, were finding them useful, and considered themselves fairly adept at using these skills. In addition, the teachers positively evaluated the overall training and the trainers' skills.

#### Trainer Observations of Classroom Implementation

One of the trainers visited each classroom four times between December and April to observe the teachers applying the ECM skills. These observations ranged between 20 and 60 minutes, averaging 48 minutes. After each classroom observation, the trainer recorded a) how frequently each skill was observed, and b) how well each skill was applied.

Combining teachers and classroom visits, the observational data indicate that teachers used some skills much more frequently than others. Among the communication skills, teachers used reflecting content and clarifying responses most frequently, and I-messages and reflecting feelings least frequently. Among the classroom management skills, teachers used positive verbal feedback and positive nonverbal cues most often, and negative verbal feedback, time-out, and tangible reinforcers least frequently. Self-concept enhancing activities were observed on 26% of the classroom visits.

Ignoring frequency and considering quality, teachers applied the skills with roughly equal competency. The trainer's average quality of implementation ratings were in the "B" to "B+" range for most skills, varying between 3.89 and 5.00 on a five-point scale, and averaging 4.14 (SD = .31) across all skills.

The number and quality of skills used varied across teachers. One teacher used six different skills in more than half of the observed sessions, whereas, another used only three different skills. The range in average quality rating



(across skills and over classroom visits) was 3.79 (i.e., "B-") to 4.42 (i.e., "B+"). The average for all teachers was 4.06 (SD = .19).

These observational data were consistent with the teacher self-report data described earlier regarding relative frequency of skill implementation. The only major discrepancy pertained to I-messages, where the teachers reported frequent implementation and the trainer observed infrequent implementation. Because I-messages were complex behaviors, teachers probably did not know exactly what the appropriate behaviors were. Evidence of this is that the teachers' self-rated mastery of this skill was low.

#### Additional Observations of ECM Classroom Implementation

Other observations were conducted by a researcher who was not involved in the training. The researcher also observed the frequency of teacher implementation of ECM-related behaviors in the classroom. However, only verbal behaviors were recorded; nonverbal behaviors and self-concept activities were not recorded.

Four of the eight teachers who completed the training were randomly selected for observation. The data were collected at three points in time: early in the training, near the end of training, and finally about six weeks after training ended. Each of the four teachers was observed once at each time point. Teacher behavior was coded for thirty minutes and then anecdotal notes were recorded. A total of six hours of observational data were collected.<sup>14</sup>

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<sup>14</sup> Observational data collected by a second researcher have not been reported due to problems with observer agreement. Most of the skills were complex and occurred infrequently, making it difficult to obtain observer agreement and maintain it over time. The data reported here are for the observer deemed most skilled by the training and research staffs at identifying ECM behaviors. It should be noted that the skilled observer identified fewer instances of ECM behaviors than the other observer because of her ability to discriminate ECM behaviors from ordinary teacher behaviors.

The anecdotal reports indicated that the amount of codeable behavior was limited by the classroom activity observed. The two primary activities observed were individualized seatwork and teacher-directed drill. When the teachers were working with students individually, dialogue was often inaudible to the observer. When teachers were conducting drills, they generally relied upon question and answer formats that precluded use of some skills.

Few, if any, communication skills were observed. Reflecting content and clarifying responses were used by only one teacher. None of the teachers used reflecting feelings or I-messages.

Negative and positive verbal feedback were used frequently by all teachers at the last time point, although these skills were observed infrequently prior to that. None of the teachers used tangible reinforcers or time-out. A counter-productive behavior, criticism, was included in the observation system. One teacher used this behavior infrequently.

The researcher's data are consistent with the trainer's observations regarding the relative frequencies of skill implementation. The only discrepancy concerned negative verbal feedback, which was observed frequently by the researcher but not by the trainer. The researcher may have used a more general definition of this category than the trainer.

## OUTCOME RESULTS

### Initial Equivalence--Students

Experimental and control students were tested for initial equivalence. The means and standard deviations for all class-level pretest and posttest measures are summarized in Table 5 for each sex and group. Due to non-normality and heterogeneity of variance,  $\log(x+1)$  transformations were performed on the following variables: Major, Unex Abs, Total Abs, Cig Involve, and Pot Involve. For the drug and attendance variables a high score is undesirable; whereas, for all other variables a high score is desirable. The posttest results will be discussed later.

Analyses of variance were performed on each of the pretest measures with condition (experimental vs. control) as the factor. For both males and females, there was little evidence of initial nonequivalence for either the experimental-control comparison or the participant-control comparison. A significant main effect for condition was obtained on one of the 20 pretest measures for males. As compared to their controls, experimental males were initially lower on Cig Costs,  $F(1,20) = 5.00, p < .05$ . No significant differences were obtained for females. Analyses of variance were also performed on each of the pretest measures with participation (participant vs. control) as the factor. As compared to controls, experimental males were initially lower on Control Fail,  $F(1,16) = 11.54, p < .01$ . The differences on Cig Costs was not significant  $F(1,16) = 3.46, p < .10$ . Once again no differences were obtained for females

TABLE 5

MEANS AND STANDARD DEVIATIONS FOR STUDENT PRE- AND POSTTEST MEASURES  
BY SEX BY TREATMENT CONDITION

Measure	Test	Male Students				Female Students			
		Experimental		Control		Experimental		Control	
		M	SD	M	SD	M	SD	M	SD
Affec Climate	Pre	1.76	.10	1.75	.09	1.86	.06	1.82	.11
	Post	1.77	.09	1.75	.20	1.82	.14	1.79	.15
Att School	Pre	1.6	.12	1.60	.12	1.72	.07	1.67	.13
	Post	1.55	.08	1.59	.08	1.62	.13	1.65	.10
Social Self	Pre	1.74	.10	1.77	.09	1.76	.08	1.72	.13
	Post	1.81	.09	1.86	.08	1.84	.10	1.84	.12
Minor	Pre	2.45	.79	2.22	.89	2.09	.66	1.72	.80
	Post	2.23	.93	2.55	.74	1.63	.84	1.88	.89
Major	Pre	.36	.05	.36	.06	.32	.04	.31	.02
	Post	.33	.04	.38	.09	.30	.01	.33	.05
Att Peers	Pre	1.67	.09	1.71	.14	1.74	.12	1.69	.15
	Post	1.72	.11	1.78	.12	1.73	.17	1.70	.11
Control Suc	Pre	1.79	.07	1.76	.07	1.85	.05	1.83	.08
	Post	1.79	.07	1.80	.07	1.83	.05	1.81	.07
Control Fail	Pre	1.59	.08	1.64	.06	1.71	.06	1.65	.11
	Post	1.64	.09	1.66	.08	1.73	.07	1.74	.11
Acad Self	Pre	1.70	.07	1.73	.10	1.76	.05	1.76	.11
	Post	1.74	.08	1.74	.09	1.73	.10	1.75	.12
Peer Att Sch	Pre	1.66	.08	1.65	.15	1.74	.08	1.72	.09
	Post	1.58	.09	1.61	.16	1.62	.16	1.68	.20
Read	Pre	5.82	.83	5.73	.88	6.01	.54	5.99	1.17
	Post	6.06	.62	5.59	.76	5.97	.40	6.04	1.16
Math	Pre	5.47	.87	5.59	.71	5.61	.69	5.60	1.28
	Post	5.77	.69	5.47	.89	5.58	.67	5.69	1.13
Unex Abs	Pre	.21	.12	.20	.17	.25	.10	.20	.12
	Post	.21	.10	.18	.15	.22	.12	.21	.13
Total Abs	Pre	.22	.09	.23	.08	.24	.07	.24	.09
	Post	.25	.07	.29	.06	.28	.09	.29	.11

Measure	Test	Male Students				Female Students			
		Experimental		Control		Experimental		Control	
		M	SD	M	SD	M	SD	M	SD
Alc Costs	Pre	.55	.24	.61	.16	.50	.09	.60	.28
	Post	.37	.16	.67	.17	.45	.20	.38	.13
Cig Costs	Pre	.38	.13	.49	.11	.45	.10	.57	.21
	Post	.38	.14	.55	.14	.39	.16	.41	.11
Pot Costs	Pre	.44	.14	.46	.21	.39	.12	.49	.21
	Post	.36	.13	.52	.20	.37	.12	.36	.10
Alc Involve	Pre	1.40	.15	1.55	.21	1.28	.17	1.39	.40
	Post	1.50	.27	1.71	.24	1.40	.25	1.37	.24
Cig Involve	Pre	.27	.03	.28	.03	.27	.02	.27	.04
	Post	.31	.04	.33	.04	.30	.03	.30	.05
Pot Involve	Pre	.25	.03	.26	.03	.25	.02	.25	.03
	Post	.27	.04	.29	.04	.27	.03	.26	.04

### Floor and Ceiling Effects--Students

Statistical analysis of measures with floor or ceiling effects generally suffers from decreased power (due to decreased reliability) and from bias. For example, students who are at the ceiling on a pretest measure where a high score is desirable (or at the floor on a measure where a lower score is desirable) cannot show improvement on the identical measure at posttest. This could bias an analysis against finding a treatment effect.

Some evidence for ceiling effects was found on the affective measures. The percentage of students with a maximum scale score at the pretest ranged from 14% on Control Fail to 32% on Social Self with a median value of 22%. The corresponding percentages at the posttest ranged from 13% to 47% with a median value of 17%. Thus, the prevalence of ceiling effects was similar on the affective pretests and posttests.

On the drug-related measures, evidence was found for floor effects. The percentage of students with a minimum scale score at the pretest ranged from 13% on Alc Involve to 52% on Pot Involve with a median value of 30%. The corresponding percentages at the posttest ranged from 9% to 41% with a median value of 30%. Thus, for the drug-related measures, the prevalence of floor effects was similar at pretest and posttest.

In sum, the affective measures, except for Social Self, did not suffer from substantial ceiling effects. Although floor effects were substantial on several of the drug-related measures, they were expected given the age of the students. Furthermore, they do not constitute a problem for the present study because no direct effects on these measures were hypothesized.

TABLE 6

SUMMARY OF COVARIANCE ANALYSES OF CLASS DATA: EXPERIMENTAL VS. CONTROL

Posttest Measure	Males		Females	
	B	F(1,19)	B	F(1,19)
Affec Climate	.17	<1	.60	<1
Att School	.14	2.33	.29	1.21
Social Self	.56	1.89	.59	<1
Minor	.12	<1	.40	1.28
Att Peers	.63	<1	.66	<1
Control Suc	.28	<1	.44	<1
Control Fail	.25	<1	.47	1.23
Acad Self	.71	<1	.95	<1
Peer Att Sch	.65	<1	1.58	2.32
Read	.67	5.29*	.80	<1
Math	.77	3.30	.81	<1
Unex Abs	.20	<1	.45	<1
Total Abs	.11	1.69	.66	<1
Alc Costs	.35	17.54**	.06	<1
Cig Costs	.49	3.96	.19	<1
Pot Costs	.56	5.16*	.21	<1
Alc Involve	.84	<1	.21	<1
Cig Involve	.75	1.50	.58	<1
Pot Involve	.79	1.13	.45	<1

B refers to the unstandardized regression coefficient of posttest on its corresponding pretest.

\* =  $p < .05$

\*\* =  $p < .001$

### Analysis of Student Outcomes

A one-way analysis of covariance was conducted on each posttest measure with the corresponding pretest as the covariate. An exception was made for Unex Abs, since the corresponding pretest did not correlate highly with it; the pretest measure, Attend, was employed as the covariate for Unex Abs. Due to lack of posttest variance and heterogeneity, Major was not analyzed.

All experimental classes were compared with all control classes. The results of these analyses are summarized in Table 6. For the boys, positive treatment effects were obtained on three variables: Read, Alc Costs, and Pot Costs. For the girls, no significant treatment effect was obtained.

The next analyses compared classes whose teachers participated in the training with control classes. For the boys, a positive effect was obtained on Alc Costs,  $F(1,15) = 12.32, p < .01$ . The effect obtained on Read was not significant,  $F(1,15) = 3.33, p < .10$ ; neither was the effect on Pot Costs,  $F(1,15) = 3.18, p < .10$ . No significant treatment effect was obtained for the girls.

The treatment effects obtained from both sets of analyses are summarized in Table 7. Effect size is expressed in the metric of the control group posttest standard deviation for each measure. The treatment effects are similar across both sets of analyses. For male students, a substantial positive treatment effect was obtained in both analyses only on Alc Costs. For female students no substantial effects were obtained.



TABLE 7

EFFECT SIZES FOR EXPERIMENTAL-CONTROL DIFFERENCES AND PARTICIPANT-CONTROL DIFFERENCES FOR MALE AND FEMALE CLASSES<sup>a</sup>

Posttest Measure	Males		Females	
	Exp-Control Effect	Part-Control Effect	Exp-Control Effect	Part-Control Effect
Affec Climate	.10	.25	.00	.33
Att School	-.74	-.62	-.58	-.19
Social Self	-.50	-.62	-.16	.08
Minor	.49	.22	.47	.29
Att Peers	-.33	-.25	.00	.62
Control Suc	-.29	-.29	.00	.14
Control Fail	.00	.78	-.37	-.18
Acad Self	.22	.56	-.17	.17
Peer Att Sch	-.25	-.13	-.40	-.30
Read	.53	.50	-.09	-.11
Math	.45	.50	-.11	-.12
Unex Abs	-.27	-.33	.00	-.08
Total Abs	.62	.16	.00	.00
Alc Costs	1.64	1.64	-.61	-.76
Cig Costs	.99	1.06	.00	-.44
Pot Costs	.70	.65	-.40	-.80
Alc Involve	.43	.77	-.25	-.04
Cig Involve	.52	.79	.00	.00
Pot Involve	.51	.76	-.52	.00

<sup>a</sup>The effects are the covariate-adjusted posttest differences expressed in the metric of the control group posttest standard deviation. A negative sign indicates a negative treatment effect.

### Initial Equivalence--Teachers

Analyses of pretest and background measures were conducted to determine a) whether teachers in the experimental and control conditions were equivalent and b) whether teachers in the experimental school who participated in the training were similar to nonparticipating teachers.

Experimental and control teachers were found not to differ in terms of teaching experience, prior in-service training, use of various academic and affective techniques in the classroom, or the pretest measures of satisfaction, faculty cohesiveness, and teaching objectives related to ECM.

There were differences between experimental participants and experimental nonparticipants. Seven of eight participants were female; whereas, all nonparticipants were males. As compared to the nonparticipants, the participants reported less teaching experience, less prior in-service training, and less use of special academic and affective techniques in the classroom during the year prior to the study. The two groups did not differ on the pretest measures of the three teacher outcome variables.

### Analysis of Teacher Outcomes

One-way (experimental vs. control) analyses of covariance were applied to each teacher posttest measure with the corresponding pretest used as a covariate. No differences were obtained on Teacher Satis,  $F(1,16) < 1$ , or ECM Object,  $F(1,16) < 1$ . A significant difference was obtained on Faculty Cohes,  $F(1,16) = 8.08, p < .05$ . Compared to experimental teachers, control teachers reported greater faculty cohesiveness. These results were unchanged when control teachers were compared with only those experimental teachers who participated in the training.

## DISCUSSION

The results of this study were disappointing. There was no evidence for the hypothesized treatment effects on teachers. In fact, there was evidence for reduced perceptions of faculty cohesiveness. The hypothesized direct effects on students' attitudes toward school, social self-esteem, perceptions of classroom climate, and discipline problems, were not supported. For boys, several effects were found that are indirectly related to the treatment, but these effects are uninterpretable given the lack of direct effects. For girls, there was no evidence for either direct or indirect effects.

It appears that ECM as implemented is not an effective prevention strategy. There was no indication that experimental classrooms were more responsive to students' affective and cognitive needs. There were moderate positive effects for males on reading achievement and marijuana costs (i.e., adverse consequences of marijuana use), but these effects did not replicate in the participant-control comparisons. For both the experimental-control and the participant-control comparisons, a substantial positive effect was obtained on alcohol costs. However, if this effect was due to the treatment, then the effect from the participant-control comparison should be larger than the effect from the experimental-control comparison. Since this was not the case, the obtained effect should not be attributed to the treatment.

One problem in this study may have been that teachers failed to adequately implement the ECM skills. However, defining the adequacy of implementation is difficult inasmuch as the ECM curriculum was predominantly unstructured.

Teachers were trained to integrate interpersonal skills within their regular classroom behavior rather than to set aside time for specific activities. Although ECM included some structured activities (i.e., self-concept enhancement activities) the emphasis was on increasing the teachers' use of communication and discipline skills with students, as needed. Whether these skills were practiced was contingent upon the occurrence of student behaviors (e.g., aggression). Adequacy may have more to do with appropriate and timely skill use than with absolute counts of skill use. Hence, determining behavioral objectives for teachers is complicated because student behavior cannot be anticipated or predicted.

In order to assess the adequacy of implementation given a program such as ECM, it may be necessary to document the patterns of student-teacher interaction in the classroom. In the present study observational data were collected on teacher behavior without regard to student behavior. While these data provided estimates of the frequency of skill use, they did not indicate how appropriately and timely the skills were used. A sequential coding system, in which teacher behaviors and precipitating student behaviors are recorded, would furnish the required information. However, this type of system entails complex analysis of behavioral contingencies which demands a large quantity of observational data. This would make the process evaluation quite costly. If future evaluations are to contribute to a better understanding of unstructured affective programs, it may be necessary to expend considerable resources for collection and analysis of process data.

Teachers are likely to use ECM skills only when the appropriate opportunities arise, and these opportunities are related to the organization and

type of classroom activities conducted. For example, teachers who allow students to interact freely with each other in the classroom may find that students spend less time on task or misbehave more often than if they did not allow this interaction. These teachers may use ECM skills more regularly because of greater opportunity to use them. By contrast, opportunities to use many ECM techniques may be quite limited in classrooms that are managed differently. Since teacher management style varies from classroom to classroom, affective programs like ECM are particularly likely to confound teacher/classroom effects with program effects. The detection of treatment effects is complicated by this lack of standardization of the treatment.

Differences among teachers in the way a treatment is implemented, and differences within teachers across occasions will inflate error variance in the student outcome measures. This will reduce the likelihood of finding treatment effects. It has been suggested that measures of variability of implementation be taken and incorporated into the data analysis (Cook & Campbell, 1979). In the present study, we attempted and failed to relate a measure of frequency of treatment implementation to classroom mean student outcomes. This failure may be due to lack of data regarding appropriateness of skill use or to inadequate power.

It is also possible that our hypotheses about the relationship between treatment implementation and student outcomes were based on a faulty assumption. Our assumption that regular use of affective skills by teachers creates positive effects on students is intuitively compelling. However, a recent observational study of classroom teacher behavior found that teacher implementation of specific affective skills was related in an unexpected way to student outcomes

(Coker, Medley, & Soar, 1980). The frequency with which many affective teacher behaviors were used was negatively related to pupil self-concept gain and/or achievement gain. Thus, the more frequently teachers used certain affective skills, the more student outcomes declined. Furthermore, some affective teacher behaviors were positively related to self-concept gain and negatively related to achievement gain, and other behaviors showed the reverse pattern of correlations. Because the relationships between teacher behavior and student gains are complex, it is unlikely that investigations of these relationships, in isolation from student effects on teachers and environmental factors, will be interpretable.

Besides the problems inherent in our treatment, there were several impediments to dedicated adoption of the program by the experimental teachers. A study of federal programs supporting educational change found that the organizational climate and the school principal critically contribute to implementation by giving moral support to participants and by creating an environment that values the program (Berman & McLaughlin, Note 12). Although ECM was not characteristic of the federal programs reviewed, this point is distinctly apropos. In many of our experimental schools the tone was that of tolerance and not support. For this reason, our treatment delivery model may have actually limited teacher commitment to implementation.

ECM may have lacked support because many teachers and principals in experimental schools never fully accepted ECM as a drug abuse prevention strategy, although our trainers explained the rationale underlying the program. The extent to which the teachers' skepticism attenuated our credibility and affected classroom implementation is unknown. In addition, we offered a

financial incentive to maximize participation in the training. However, extrinsic rewards generally fail to guarantee commitment to program implementation if teachers are not motivated to change on the basis of professional growth (Berman & McLaughlin, Note 12).

In ECM, teachers were taught to apply specific affective skills in an ad hoc manner. These skills were added to the teachers' existing repertoire of classroom behaviors. The training and follow-up visits did not directly venture to change the teachers' teaching styles nor their established classroom routines which may have been incompatible with the program's goals. ECM did not ask that teachers change their classroom learning activities in ways that would maximize opportunities to use ECM skills. For example, the trainers might have asked teachers to "personalize" learning by relating academic content to students' personal lives. In the future, developers of affective in-service training programs should consider promoting changes in general teaching style and in the organization of classroom activities.

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