BROOME COUNTY
YOUTH PREVENTION PARTNERSHIP
State Incentive Cooperative Agreement (SICA) Project

Comprising the School Districts of:
Johnson City
Maine-Endwell
Union-Endicott

BCYPP Year Two Outcomes Report: Life Skills Training in Maine-Endwell and Union-Endicott School Districts

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7/12/02

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ACKNOWLEDGMENTS

This prevention program could not have taken place without the hard work and dedication of the Maine-Endwell and Union-Endicott School Districts' administration and staff.

INTRODUCTION

Funded by the New York State Office of Alcoholism and Substance Abuse Services (OASAS), the Broome County Youth Prevention Partnership (BCYPP) is a coalition of community organizations whose goal is to reduce adolescent substance abuse in Broome County. This endeavor is guided by the Communities That Care®(CTC) prevention framework, which provides a procedure for identifying the variables that both increase and decrease the likelihood of substance abuse, termed risk and protective factors. CTC additionally provides a method for selecting and implementing science-based prevention programs applicable to different constellations of risk and protective factors. Throughout the process, the CTC operating system stresses quantitative assessment in identifying risk/protective factors and the impact of the program.

The BCYPP conducted a multifaceted needs assessment that incorporated CTC student self-report surveys[1], student focus groups[2], and a survey of Broome County parents[3]. The purpose of this needs assessment was to provide qualitative and quantitative data unique to the Broome County community in order to inform and guide future community programming decisions. Taken together, the needs assessment illustrated that although Broome County has many strengths, adolescent substance abuse is a still a problem[4]. In particular, alcohol and marijuana use were problematic relative to national norms, especially in 12th graders. In addition, Broome County teens appear to transition into substance use more swiftly than the national trend. Based on these data and other supporting evidence, the BCYPP implemented a science-based substance abuse

[1] Developmental Research &Programs, Inc (2001) *Communities that Care Youth Survey: Broome County*
[2] MacKillop, et al. (2001) *BCYPP Focus Group Report*
[3] Ryabchenko, et al., (2001) *Broome County Parent Perspectives*
[4] MacKillop, et al. (2002) *Broome County Comprehensive Risk Profile*

prevention program, Life Skills Training (LST), in specific BCYPP target areas. LST is a three-year intervention intended for all adolescents that uses both traditional informational and cognitive-behavioral techniques and has been shown to significantly reduce substance use. This report details the outcome of the first year of LST intervention in two target school districts, Maine-Endwell and Union-Endicott.

SUMMARY OF OUTCOMES

The implementation of Life Skills Training (LST) in Maine-Endwell and Union Endicott School Districts has been successful. Statistical analysis detected significant changes in knowledge and other outcome variables in the directions intended by the program. The implementations adhered closely to the recommended procedures, and these outcomes converge with previously published research on Life Skills Training in controlled trials. Although longer-range outcomes (e.g., after the second and third year of participation) may be variable, these early-stage results lay a strong foundation for the eventually successful prevention record of LST. It is, therefore, urged that the program continue to be implemented as planned. In addition to these findings, some other noteworthy results, including changes on perceptions of peer substance use and the impact of LST on perceived competence and alcohol expectancies are also discussed.

MAINE-ENDWELL SCHOOL DISTRICT

METHOD

INTERVENTION & EVALUATION DESIGN

Life Skills Training (LST) was developed in the early 1980's by Dr. Gilbert Botvin and colleagues as a preventive intervention to reduce the initiation of smoking[5,6] and showed reductions of up to 58%. Subsequently, LST was elaborated to include preventive components for most illicit drugs, and has been shown to significantly reduce drinking and marijuana use[7]. LST is a three-year intervention, which includes a 15-session classroom curriculum in the first year and 10 and 5 booster sessions in the subsequent two years. The use of booster sessions has been shown to significantly improve the outcomes of LST[8]. The program is intended specifically for all three years of middle school/junior high and can be implemented in 6th, 7th, and 8th grade or 7th, 8th, and 9th grade. LST can be implemented either in consecutive sessions or once a week for multiple weeks. A description of the components of LST is included below.

Components of Life Skills Training

- **Drug Use: Myths and Realities**
- **Decision-making and Independent Thinking**
- **Media Influences and Advertising Techniques**
- **Self-image and Self-Control**
- **Coping with Anxiety**
- **Communication Skills**
- **Social Skills**
- **Assertiveness**

[5] Botvin, Eng & Williams (1980) *Preventive Medicine, 9, 135-143*
[6] Botvin & Eng (1982) *Preventive Medicine, 11, 199-211*
[7] Botvin et al., (1984) *Addictive Behaviors, 9, 137-147*
[8] Botvin, Renick, & Baker (1983) *Journal of Behavioral Medicine, 6, 359-379*

In Maine-Endwell the evaluation design was a standard pretest-posttest. All 6th grade students in the Maine-Endwell middle school received LST. The 6th grade was assessed because they will be the first group to experience all three years. Assessment took one class period and involved two measures, the Life Skills Training Questionnaire (LST-Q) and Perceived Competence Scale for Children (PCSC). The Binghamton University Human Subjects Research Review Committee approved procedures for assessment of LST.

The LST-Q, provided by the program developers for use with the program, directly measures the program on different aspects of acquired knowledge, attitudes toward substances, skills acquisition, substance use behavior, and perceptions of peer and adult substance use. The PCSC is a measure of perceived competence in multiple areas. Increasing self-competence has been hypothesized as one of the mechanisms by which LST is effective[9] and an independent measure of this was considered informative. Both measures are described in greater detail in the following sections.

The students received LST in 15 consecutive sessions and were assessed immediately before and after. This design provides information on how much change has taken place over the course of the intervention. It is important to note that, without a control group, this design cannot rule out the possibility that any demonstrated changes might be based on maturation, knowledge or attitudes developed from sources other than LST, and other possibilities besides the direct benefit of participation in LST.

The degree of adherence to the LST program is also an important consideration. The BCYPP used two measures of fidelity. The teacher implementing LST completed an

[9] Botvin et al. (1984) *Journal of Studies on Alcohol, 45, 550-552*

implementation checklist at the end of each lesson and independent observers made classroom observations with the same implementation checklist.

ANALYSES

Both LST-Q and PCSC subscales were examined for distribution normality. The three knowledge scales, Assertiveness Skills, Anxiety Management Skills, Self-control Skills, and perceptions of peer and adult substance use were sufficiently normally distributed. Several of the scales exhibited substantial skewness and for this reason were transformed in order to meet assumptions of the statistical test to be used, the Analysis of Variance (ANOVA). Substance use attitude scales were all positively skewed because of generally negative attitudes toward substances and were logarithmically transformed. Drug Refusal Skills II required a reflection and square root transformation and no transformation was attempted with Drug Refusal Skills I because of the interpretation problem described in the text.

The "Use" and "Intention to Use" scales were severely skewed due to low rates of substance use behavior. Transformations did not improve skewness due to homogeneity of responses (i.e., nearly all students endorsed "never"). The table below presents the frequency of students who endorsed each level of use for cigarettes before and after LST program administration to illustrate the nearly uniform response pattern.

About how often do you smoke cigarettes?	**Pretest**	**Posttest**
Never	86	84
A few times BUT not in the past year	3	3
A few times a year	1	1
Once a month	0	1
A few times a month	0	0
Once a week	0	0
A few times a week	0	0
Once a day	0	0
More than once a day	0	0

Due to the homogeneity of responses, each question on the "Use" and "Intent to Use" scales was recoded as a dichotomous variable ("0" = no use or no intention to use; "1" = some use or some intention to use). The McNemar, a nonparametric statistical procedure, was used to test for changes in responses from pretest to posttest using a chi-square distribution. For this example, the majority of the students reported that they had never tried cigarettes prior (96%) to LST and following LST (95%), hence the chi-square distribution was equivalent and no significant changes were detected.

About how often do you smoke cigarettes?	**Pretest**	**Posttest**
Never	86	86
Tried cigarettes at least once	3	5

OUTCOMES

DEMOGRAPHICS

One hundred eighty-seven students completed the Life Skills Training curriculum and provided valid pre- and posttest data. Of these students, a little more than one half were male (53%) and the majority came from an intact family (69%). The majority reported White ethnicity (83%), 2% reported Latino/Hispanic ethnicity, 3% reported Black/African-American, and, surprisingly, 9% reported Native American/American Indian. Regarding this last category, this information does not converge with the previously reported demographics of Maine-Endwell schools[4] and was considered likely due to a misunderstanding; a possibility is that the term Native American is frequently interpreted as "born in America".

ATTENDANCE

Life Skills Training was implemented in two successive groups during the winter of 2001-2002. Classroom attendance was generally very high, ranging from 89% to 98% over the three-week intervention period for both groups. This average absenteeism rate, as shown below, is sufficiently low to suggest that the students participating were exposed to a large majority of the curriculum taught. More detailed attendance data is presented in Tables 1 and 2 of Appendix A.

Implementation Group	Average Attendance Rate
#1 (11/26-12/19/02)	94%
#2 (2/1-2/28/02)	93%

IMPLEMENTATION FIDELITY

Fidelity refers to the extent that the program was implemented in accord with the instructions provided by the program manual. Failure to adhere to the instruction manual -- even if well-intentioned -- can sometime spell the difference between successful and unsuccessful outcome. LST was assessed using the Implementation Checklist (ICL) provided for use with this program. During the implementation of LST for the first group, the teacher completed this worksheet at the end of each day, but immediately after each class during the second implementation. In addition, at various points independent raters also completed the same checklist when they had observed the LST class. This checklist includes one section listing Objectives and another listing Topics and Activities both of which are marked dichotomously "Yes" or "No". The ICL also requests an estimate of time spent during class providing lecture, conducting a demonstration, discussing materials and practicing the skills. Although ICLs were completed differently for each implementation (one per day of implementation #1 vs. one per class of implementation #2), there was very high correspondence between the fidelity responses for the teacher and the observers. This suggests that the single ICL for a day of implementation adequately reflected the degree of content covered and for this reason, individual class data and daylong data were combined for analysis.

The teacher's reports indicated that the percent of lesson objectives completed ranged from 55% to 100%, with a mean of 93%. In scrutinizing the data, the occasion when only 55% of the objectives were met was highly anomalous and may have reflected an unusual event or a particularly disruptive class. In terms of topics and activities covered, similarly positive reports were made yielding an average of 80% of topics and

activities implemented. In terms of the time in class apportioned to different activities, on average 36% of class was spent lecturing, 20% was spent in discussion, 12% in demonstration and 33% practicing (these data do not add to 100% because of rounding).

Twelve lectures were observed by at least one independent observer during the second implementation of LST (2/1-2/28/02) of which five lectures were observed by two independent observers. According to their reports, over the course of the twelve observed lessons, the average percent of objectives met was 99% and the average percent of topics and activities completed was 73%. In terms of class time distribution, an average of 28% was spent in lecture, 23% of the time was spent in discussion of the content, 12% of the time was spent in demonstration, and 29% was spent practicing the content taught. When a second observer also observed the class, there was high convergence between the ratings of both observers: the average percent of objectives completed was 100%; 60% of the topics and activities were completed; and class time was distributed similarly between lecture (34%), discussion (27%), demonstration (12%) and practice (27%). This is also reflected in high inter-rater reliability: r-Objectives = .98; $p<.01$; r-Topics and Activities = .96; $p<.01$.

These data suggest that the implementation in Maine-Endwell was completed with a high degree of fidelity. Both the teacher and independent observers reported an average of over 90% fidelity to the LST curriculum. Teacher and observer estimates were highly correlated, r-Rater 1 = .978; $p<.01$ and r-Rater 2 = 1.0; $p<.01$. In terms of Objectives, the implementing teacher actually rated her implementation slightly below that offered by the independent observers suggesting inflation due to response bias was not present. In the case of Topics and Activities, minimal divergence was found between

the reports of the teacher and independent observers (Teacher Mean = 75% vs. Independent Observer Mean = 73%). Overall, the Maine-Endwell implementation of LST completed the vast majority of objectives (93%), covered most of the topics and activities associated with the program (80%), and was delivered in a fashion that combined lecture, discussion, demonstration and practice. Taken together, this has been a high-fidelity LST implementation.

LIFE SKILLS TRAINING QUESTIONNAIRE (LST-Q)

Knowledge

The LST-Q provides three indices of knowledge: an Overall Knowledge Score (OKS) consisting of 32 true-false questions regarding information LST teaches, and a Life Skills Knowledge Score (LSKS) and Drug Knowledge Score (DKS) consisting of subgroups of items from the 32. One-way within-subjects analysis of variance (ANOVA) was used to detect changes from pretest to posttest. Significant changes were found for all three scales, the largest of which was for Drug Knowledge. These results most globally indicate that the students received the LST program in a fashion that had a measurable impact; that LST had "sunk in", so to speak. In terms of actual change, scores on these three measures increased by 8% in terms of Overall Knowledge, 5% in terms of Life Skills Knowledge, and 13% in terms of Drug Knowledge.

These changes may not seem very large but given the students receiving LST had previously participated in Drug Abuse Resistance Education (DARE), it is possible that a certain amount of residual information inflated the pretest means, which were between 63% and 73%. This hypothesis is somewhat corroborated by the largest changes taking place where the pretest score was lowest, Drug Knowledge. That all three scores changed from pretest levels in a statistically significant fashion attests to the impact of the program. Means, F values, and effect sizes are presented in Table 1 of Appendix C.

Attitudes Toward Substance Use

Substance use attitude variables on the LST-Q assess the student perceptions of using different substances. This section asks students to rank statements on a scale from one ("Strongly Agree"), to five ("Strongly Disagree"), and includes statements such as,

"Kids who drink alcohol are more grown-up" and, "Kids who smoke have more friends". Attitude scores are provided for each substance use behavior, including smoking tobacco, drinking alcohol, smoking marijuana, or using hard drugs. LST is intended to reduce positive attitudes toward substances.

No statistically significant differences were found from pretest to posttest on any of the attitude variables, although changes in attitudes toward smoking and marijuana use showed trends toward significance. However, contrary to expectations, these changes were in the direction of *more* positive attitudes. Although it is possible that LST actually increased positive attitudes toward these substances, these findings are also possible because Maine-Endwell students reported very negative attitudes toward substances in the first place. Unlike Knowledge Scales in which a low score reflected a lack of knowledge, low scores on Attitude scale reflect negative attitudes toward substance and means on the attitudes scales at pretest ranged from 1.15 to 1.23, on a scale from one to five. This suggests a "floor-effect", or a restriction in the amount of reduction that could be shown. This floor effect in combination with inherent statistical variation of response may have spuriously created this trend. Means, F-values, and effect sizes are presented in Table 2 of Appendix C.

Skills

Skills outcomes as measured by the LST-Q reveal the students' reported comfort with the skills taught during LST. This is determined based on their self-reported likelihood of using a particular skill in certain situations, as requested by questions such as "If someone asked you to smoke, drink, use marijuana, or other drugs, how likely

would you tell them ‘no’ or ‘no thanks’?” Responses are measured on a scale from one to five using wording depending on the type of skill being assessed.

Significant changes were evident in terms of Assertiveness Skills, Self-control Skills, and the second of two scales measuring Drug Refusal Skills, but not for Anxiety Reduction Skills or the first Drug Refusal Skills scale. For the first three variables, these outcomes are in line with what is anticipated following an LST intervention: increases in self-reported assertiveness skills, self-control skills and drug refusal skills. In terms of the nonsignificant findings, pretest-posttest changes on anxiety management skills scale are in the anticipated direction (increasing), but minimally so; LST functionally did not influence self-reported anxiety management skills.

It should be noted that one scale was disregarded, the first Drug Refusal Skills scale, due to wording ambiguity. Specifically, the scale asked “How likely would you be to say “no” when someone asks you to:”, followed by examples of substance use behavior such as “smoke a cigarette”. The possible responses choices are labeled at the head of a column of a table with rows labels consisting of the type of substance in question. The responses are measured on a scale from one to five ranging from “Definitely Would” to ““Definitely Would Not”. At first glance, unless the survey taker carefully reads the instructions at the top of the table, it appears that the question is asking whether the responder would use any of the following substances rather than “say no”. There was some ambiguity as to whether the student was endorsing saying no or using the drug. Thus, it appeared a large proportion of students stated they would categorically *not* say no, intending to state they would not use substances. As a result

these data were not interpretable. For all other variables, the means, F-values and effect sizes are reported in Table 3 of Appendix C.

Perceived Peer and Adult Substance Use Norms

Perceptions of both peer substance use and adult substance use are assessed on the LST-Q by asking students to estimate the percentage of people in either category that use a substance, using a five-point scale ranging from "None" to "All or Almost All". In addition to five different substances, a summary score for peers and adults was calculated. Students often overestimate peer and adult substance use. LST attempts to reduce the perceptions that substance abuse is widespread, even normative, by presenting accurate prevalence estimates. For the categories of both peers and adults, the results were very consistent: responses about estimates of each type of substance significantly changed, as did their summary scores. Surprisingly, however, these changes were not in the same direction; students who received LST reported reduced estimates of adult substance use, but *increased* estimates of peer use. The latter change is contrary to what would be predicted.

It is possible to interpret this finding in several ways. It is possible that another floor effect is taking place; averages on a scale from one to five ranged from 1.4 to 1.9 with one being "None" and two being "Less than half". Thus it is possible that students reflexively reported that their peers used no substances at pretest and gave more reasoned answers at posttest that regressed toward the mean. A second possibility is that the students were actually underestimating substance use and that the program altered their estimates, but in an unanticipated way. Finally, it could be that the Life Skills curriculum and its focus on teen substance use did in fact engender the perception that more teens

were using substances following the program. All means, F-values, significance and effect sizes are presented in Table 4 of Appendix C.

Substance Use and Intention to Use

Current substance use was measured by six questions about the respondent's frequency of use employing a nine-point scale, ranging from 1, "Never", to 9, "More than once a day." In addition, a composite score of the average of responses to the six substances was calculated. Intention to use a substance is assessed using the similar substances, scale and scores. In both cases, Maine-Endwell students reported minimal substance use and intention to use substances. For example, at baseline, 92.7% of Maine-Endwell 6th graders reported never having smoked a cigarette, 3.2% reported having smoked a few times but not in the past year, 1.6% reported having smoked in the past year, .5% (one person) reported smoking a few times per month, and 1% (2 people) reported smoking daily. In terms of drinking alcohol to the point of getting drunk, 96% reported never having done so, 2% reported having done it once, and one person endorsed the categories "A few times a year" and "More than once a day". These rates are presented in Table 5 of Appendix C.

The same patterns were evident for intention to use substances. Ninety-one percent of students reported they would "Definitely not" smoke in the coming year, and only 2% reported it was more likely than not. In terms of drinking and marijuana use, 97% and 99% percent respectively reported "Definitely not" intending to use either substance in the coming year.

As might be expected, it was evident that students who reported any use also reported greater intention to use. For example, the two students who reported smoking

daily accounted for 2/3 of the students who endorsed that they "definitely will" smoke in the next year, the only student who reported smoking marijuana once a month (the highest report), was also the only student to report that he or she "definitely will" smoke marijuana in the coming year, and the single student who reported using inhalants was also the only student who reported that he or she "definitely will" use inhalants in the coming year. Thus, answers on the two questions paralleled each other and suggest that a very small subpopulation have experimented with substances and intend to use in the future. Given the redundancy of intention to use with actual use, only the summary score is presented in Table 5 of Appendix C.

These reports of minimum responding for both sets of variables created a highly positive skew to the data. Therefore, the McNemar nonparametric test was used to determine if changes between answers were significantly different after LST. No significant changes on use or intended use were evident, which is not surprising given the aforementioned low base rates of self-reported substance use and short three- week window of time being observed. In addition, lack of change in these areas is not necessarily cause for concern since previous research has reported no differences at immediate posttest but six months later found significant reductions in drinking behavior compared to a control group[7].

In general the pattern of findings in Maine-Endwell converges with previously reported data on LST implementation. Two outcome studies that reported immediate LST posttest findings while using slightly different variables showed similar changes, in particular in the knowledge domain. This is somewhat paradoxical since LST is intends to emphasize skills-based learning as opposed to preventive interventions emphasizing

information (e.g. DARE)[6]. However the absence of significant findings on hypothesized mediating variables is a research question beyond the BCYPP implementation. More importantly, the cited interventions subsequently reported significant reduction of substance abuse relative to control groups later in adolescence. Therefore, given this similar pattern of findings in Maine-Endwell, it is reasonable to presume that if the program is completed as planned, a similar impact will take place.

PERCEIVED COMPETENCE SCALE FOR CHILDREN (PCSC)

The PCSC is a 36-item questionnaire that assesses children's sense of their competence (also referred to as self-efficacy) in five domains: scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct and global self-worth[10]. The actual questionnaire is titled "What I Am Like". Students read two perspectives of an activity or experience, selected the one that reflected them the most and endorsed how much the statement was true about them. Only about one half of the Maine-Endwell students (90) completed the PCSC due to a systematic misunderstanding by the first implementation group.

Comparisons of pre- to posttest revealed no significant changes for any of the PCSC scales. There are various possibilities for the lack of findings on this measure. First, it is possible that the questions in each domain assessed by the PCSC are simply too broad for a three-week intervention to influence. Second, as an intervention LST does not directly speak to some topic areas of the subscales; for example, physical appearance or athletic competence. Third, the reduced numbers of valid surveys could have reduced the statistical power necessary to observe significant findings. Fourth, it is possible that an early stage impact on perceived self-competence is not evident, but that effects may be seen at a later time. Equally, it is possible that LST simply does not substantially influence perceived competence as measured by the PCSC. The means, F values, effect sizes and significance are presented in Table 6 of Appendix C.

[10] Harter, S. (1982) The Perceived Competence Scale for Children. *Child Development, 53,* 87-97. Harter, S. (1985). *Self-Perception Profile for Children: Manual*. Denver: University of Denver

STUDENT PERSPECTIVES

One hundred eighty seven students completed a short questionnaire (see Appendix E) developed by the BCYPP Information Specialist Team to assess student perspectives of LST. The questionnaire asked open-ended questions about what they liked best and least about LST which were subsequently organized into predetermined categories. The questionnaire also asked whether they had been in another prevention-type program and, if so, how LST compared to it on several indices.

Students' reports (of what they liked the most revealed that almost 43% liked the rehearsal aspect of the program best, while 14% liked best the knowledge that they learned. In addition, 27% cited favorably aspects of the program that didn't fit into a specific category. When asked what they liked least, 30% specifically reported the LST workbook, while the largest proportion (50%) reported program aspects that did not fall into any of the expected categories. Negligible proportions endorsed that they least liked having to sit still, read too much, or that they either already knew the information or found it embarrassing.

As expected, all of the students responded that they had previously participated in DARE, which was compared to LST in the final four questions. In each case the students responded that they were almost equal, describing them both as being similarly Effective, Foolish, and Understandable, although describing LST as being more Boring than DARE. To our knowledge, there have been no previous efforts to gather data regarding the experience of participating in these programs, nor whether perceived enjoyment of a prevention program relates to actual prevention outcomes. Moreover, feedback from 6th

grade students on their perceived enjoyment of schoolwork may be subject to a substantial negative response bias. All responses and means are reported in Appendix D.

TEACHER PERSPECTIVE

Following the first LST implementation, the Family and Consumer Sciences teacher who conducted the program was interviewed by one of the BCYPP Information Specialists to get her perspective on the program. She described the program as requiring considerably more teacher direction than the usual coursework and perceived that the students found the material somewhat boring. However, the teacher also commented that LST was preceded by two weeks of fun and creative activities, possibly explaining some students' response. The teacher also commented that she thought a once-a-week presentation as opposed to every day might make the program more interesting for the students. Finally, regarding the student evaluation of LST, the teacher also commented that asking students how boring they found an educational program would yield the aforementioned negative response bias.

CONCLUSIONS

Taken together, these findings suggest that the implementation of Life Skills Training in Maine-Endwell was successful. Significant changes in Overall Knowledge, Life Skills knowledge, Drug knowledge, Assertiveness skills, Self-Control Skills and Perceptions of adult substance use all took place in the expected directions and these findings converge with previous outcome studies of Life Skills Training. While actual use or intention to use did not change, this can best be understood as a function of very low usage in general by the 6th graders and as well as the limitations on actual behavior change imposed by a three week-timespan for program implementation and evaluation.

In addition, several somewhat unusual findings emerged. The systematic misunderstanding of the Drug Refusal Skills I scale suggests that the test developers should revise the wording of those items. The statistically significant increase in perceived peer use is particularly unusual and, while possibly attributable to a floor effect, should be investigated further. Finally, while LST has been suggested to reduce substance use in part by increasing self-efficacy, or perceived self-competence[9], the absence of any changes on the Perceived Competence Scale for Children were unexpected. As mentioned however, the measure may simply be too broad for a three-week intervention.

These finding suggest that, as a result of participation in LST, the 6th graders in Maine-Endwell are likely to demonstrate reductions in otherwise expected substance use associated with Life Skills Training during the upcoming years, *assuming continuation of the program*. Previous research has indicated the significant additive effects of booster sessions[8] and for the desired reductions, i.e., preventive benefits; it is critical that the

second and third year be implemented with the same quality and fidelity as this first intervention. In addition, it is critical that these two years also be evaluated to ascertain the program's effectiveness. It is also recommended that any evaluation dovetail with the efforts described herein, for example by using at least the LST-Q and potentially additional measures, such as the PCSC. The investment by Maine-Endwell School District in undertaking a thorough implementation and evaluation will assess the impact of Life Skills Training, demonstrate the extent of its benefits, and provide the basis for decisions about its longer-term continuation.

UNION-ENDICOTT SCHOOL DISTRICT

METHOD

INTERVENTION & EVALUATION DESIGN

Life Skills Training (LST) was developed in the early 1980's by Dr. Gilbert Botvin and colleagues as a preventive intervention to reduce the initiation of smoking[5,6] and showed reductions of up to 58%. Subsequently, LST was elaborated to include preventive components for most illicit drugs, and has been shown to significantly reduce drinking and marijuana use[7]. LST is a three-year intervention including a 15-session classroom curriculum in the first year and 10 and 5 booster sessions in the subsequent two years. The use of booster sessions has been shown to significantly improve the outcomes of LST[8]. The program is intended specifically for all three years of middle school/junior high and can be implemented in 6th, 7th, and 8th grade or 7th, 8th, and 9th grade. LST can be implemented either in consecutive sessions or once a week for multiple weeks. A description of the components of LST is included below.

Components of Life Skills Training

- **Drug Use: Myths and Realities**
- **Decision-making and Independent Thinking**
- **Media Influences and Advertising Techniques**
- **Self-image and Self-Control**
- **Coping with Anxiety**
- **Communication Skills**
- **Social Skills**
- **Assertiveness**

In Union-Endicott the evaluation was a standard pretest-posttest design. During spring 2002, half of the 6th grade students in the Union-Endicott middle school received LST. The 6th grade was assessed because they will be the first group to experience all three years of LST. Assessment took one class period. The students were assessed before and after the intervention by means of the Life Skills Training Questionnaire (LST-Q) and the Alcohol Expectancy Questionnaire-Adolescent version[11] (AEQ-A). The Binghamton University Human Subjects Research Review Committee approved procedures for evaluation.

The LST-Q, provided by the program developers for use with the program, directly measures the program on different aspects of acquired knowledge, attitudes toward substances, skills acquisition, substance use behavior, and perceptions of peer and adult substance use. This measure is a comprehensive assessment of the LST curriculum as well as the proximal variables it purports to influence in preventing substance use.

The AEQ-A is a measure of an individual's expectancies of the effects of alcohol. Specific expectations for the effects of alcohol have been measured in children as young as eight years old[12] and prior to experience with alcohol, expectancies have been shown to be predictive of both onset and problem drinking[13]. Moreover, alcohol expectancies have been theorized to mediate the influence of risk factors[14], and the modification of expectancies has been speculated to be one of the mechanisms by which LST is effective[15]. Because this latter hypothesis has not been extensively tested, it was

[11] Brown, Christiansen, & Goldman (1987). *Journal of Studies on Alcohol, 48,* 483-491.
[12] Dunn & Goldman (1998) *Journal of Consulting and Clinical Psychology, 66,* 579-585.
[13] Smith, Goldman, Greenbaum, & Christiansen (1995). *Journal of Abnormal Psychology, 104*, 32-40.
[14] Goldman, Darkes, & Del Boca (1999). Expectancy Mediation of Biopsychosocial Risk for Alcohol Use and Alcoholism; In I. Kirsch (Ed) *Expectancy, Experience and Behavior.* APA Books: Washington, DC
[15] Botvin et al. (1984) *Journal of Studies on Alcohol, 45, 550-552*

considered useful to include an independent measure of alcohol expectancies. Both measures are described in greater detail in the following sections.

This evaluation design was intended to provide information on how much change has taken place over the course of an intervention.

ANALYSES

Both LST-Q and AEQ subscales were examined for distribution normality. The three knowledge scales, Assertiveness Skills, Anxiety Management Skills, Self-control Skills, and perceptions of adult substance use were sufficiently normally distributed. Several of the scales exhibited substantial skewness and for this reason were transformed in order to meet assumptions of the statistical test to be used, the Analysis of Variance (ANOVA). Substance use attitude scales were all positively skewed because of generally negative attitudes toward substances and were inversely transformed. Use and Intention to Use were so positively skewed due to low base rates of use that no transformation was conducted and nonparametric inferential analyses were used instead, specifically, McNemar nonparametric tests. Drug Refusal Skills II required a reflection and square root transformation and no transformation was attempted with Drug Refusal Skills I because of the interpretation problem described in the text.

The "Use" and "Intention to Use" scales were severely skewed due to low rates of substance use behavior. Transformations did not improve skewness due to homogeneity of responses (i.e., nearly all students endorsed "never"). The table below presents the frequency of students who endorsed each level of use for cigarettes before and after LST program administration to illustrate the nearly uniform response pattern.

About how often do you smoke cigarettes?	**Pretest**	**Posttest**
Never	70	70
A few times BUT not in the past year	5	4
A few times a year	1	1
Once a month	0	0
A few times a month	0	0
Once a week	0	0
A few times a week	0	0
Once a day	0	0
More than once a day	0	1

Due to the homogeneity of responses, each question on the "Use" and "Intent to Use" scales was recoded as a dichotomous variable ("0" = no use or no intention to use; "1" = some use or some intention to use). The McNemar, a nonparametric statistical procedure, was used to test for changes in responses from pretest to posttest using a chi-square distribution. For this example, the majority of the students reported that they had never tried cigarettes prior (92%) to LST and following LST (92%), hence the chi-square distribution was equivalent and no significant changes were detected.

About how often do you smoke cigarettes?	**Pretest**	**Posttest**
Never	70	71
Tried cigarettes at least once	7	6

OUTCOMES

DEMOGRAPHICS

Eighty-two students received LST. Of the total, a little more than one half were male (55%) and the majority came from an intact family (64%). The majority reported White ethnicity (87%), 5% reported Black/African-American, and 1% Asian ethnicity. Surprisingly, 5% reported Native American/American Indian, which does not converge with the previously reported demographics of Union-Endicott schools[4], and was considered likely due to a misunderstanding; a possibility is that the term Native American is frequently interpreted as "born in America".

ATTENDANCE

Life Skills Training was implemented once per week over the course of Spring 2002, from 2/4/02 to 5/16/02. Classroom attendance was collected from 12 of the lessons and was generally very high, ranging from 77% to 100% over the intervention period. The average attendance was 92% and is sufficiently high to suggest that the students participating were exposed to a large majority of the curriculum taught. More detailed attendance data is presented in Table 3 of Appendix A.

IMPLEMENTATION FIDELITY

Fidelity refers to the extent that the program was implemented in accord with the instructions provided by the program manual. Failure to adhere to the instruction manual -- even if well-intentioned -- can sometime spell the difference between successful and unsuccessful outcome. LST was assessed using the Implementation Checklist (ICL) provided for use with this program. During the implementation of LST, the teacher completed this worksheet immediately after each class. In addition, at various points independent observers also completed the same checklist when they had observed the LST class. This checklist includes one section listing Objectives and another listing Topics and Activities, both of which are marked dichotomously "Yes" or "No". The ICL also requests an estimate of time spent during class providing lecture, conducting a demonstration, discussing materials, and practicing the skills.

The teacher completed implementation Checklists for 48 class periods. According to the teacher, the percent of Objectives completed ranged from 77% to 100%, with a mean of 95% completed. In terms of Topics and Activities, similarly positive reports were made with a range from 66% to 100%, and an average of 95%. In terms of the time in class apportioned to different activities, on average 37% of class was spent lecturing, 32% was spent in discussion, 13% in demonstration and 19% practicing.

An independent observer observed six lectures. Over the course of the six observed lessons, the average percent of Objectives met was 99% and the average percent of Topics and Activities completed was 100%. These assessments were highly correlated with the teacher's report for the same classes ($r = .99$ and 1.0, respectively; $p<.01$). In terms of class time distribution, an average of 63% was spent in lecture, 23% of the time

was spent in discussion of the content, 6% of the time was spent in demonstration, and 12% was spent practicing the content taught. Since these estimates diverge slightly from the teacher's report, it appears that the teacher and observer differed in their interpretation of what activities constituted each category. More importantly however, is that the independent observer actually assessed Objectives and Topics and Activities higher than the teacher, suggesting no inflation due to response bias.

These data suggest that the implementation in Union-Endicott was completed with a high degree of fidelity. Both the teacher and independent observers reported an average of over 90% of both Objectives and Topics and Activities completed and their estimates were highly correlated (r = .99 and 1.0, respectively). In terms of Objectives, the implementing teacher actually rated her implementation slightly below that offered by the independent observers, suggesting that these ratings were not inflated. Further, according to both the teacher and independent observers, the Union-Endicott implementation of LST was delivered in a fashion that combined lecture, discussion, demonstration and practice; this was a high-fidelity LST implementation.

LIFE SKILLS TRAINING QUESTIONNAIRE (LST-Q)

Knowledge

The LST-Q provides three indices of knowledge: an Overall Knowledge Score (OKS) consisting of 32 true-false questions regarding information LST teaches, a Life Skills Knowledge Score (LKS), and a Drug Knowledge Score (DKS) consisting of subgroups of items from the 32. Significant changes were found for all three scales, of which Overall Knowledge and Drug Knowledge were largest. These results most globally

indicate that the students who received the LST program in a fashion that had a measurable impact; that LST had "sunk in", so to speak. In terms of actual change, scores on these three measures increased by 5% in terms of Life Skills Knowledge, 8% in terms of Overall Knowledge, and 11% in terms of Drug Knowledge. That all three scores changed from pretest levels in a statistically significant fashion attests to the successful impact of the program.

Attitudes Toward Substance Use

Substance use attitude variables on the LST-Q assess student perceptions of using different substances. This section asks students to rank statements on a scale from one ("Strongly Agree"), to five ("Strongly Disagree"), and includes statements such as, "Kids who drink alcohol are more grown-up" and, "Kids who smoke have more friends". Attitude scores are provided for each substance use behavior, including smoking tobacco, drinking alcohol, smoking marijuana, or using hard drugs. LST is intended to reduce positive attitudes toward substances.

There were not any statistically significant reductions in substance use attitudes, however, for two scales, Pro-Smoking Attitudes and Pro-Drinking Attitudes, changes approached significance (p's = .068 and .079 respectively). This suggests that were a larger sample size used, these differences would have been significant. Means, F-values, and effect sizes are presented in Table 8 of Appendix B.

Skills

Skills outcomes as measured by the LST-Q reveal the students' reported comfort with and assimilation of the skills taught during LST. This is determined based on their

self-reported likelihood of using a particular skill in certain situations, as requested by questions such as “If someone asked you to smoke, drink, use marijuana, or other drugs, how likely would you tell them ‘no’ or ‘no thanks’?” Responses are measured on a scale from one to five using wording depending on the type of skill being assessed.

A statistically significant increase in Assertiveness Skills was identified and an increase in Anxiety Reduction Skills approached significance (p=.073), both moving in the anticipated direction (increasing). Self-control Skills and the second of two scales measuring Drug Refusal Skills, did not change significantly. In the latter two variables, these outcomes are inconsistent with anticipated outcomes following an LST intervention, which would predict an increase on both. However previous outcome studies of LST have reported not detecting significant changes on multiple outcome variables at this first stage of assessment with subsequent successful prevention outcomes[7,8].

It should be noted that one scale was disregarded, the first Drug Refusal Skills scale, due to wording ambiguity. Specifically, the scale asked “How likely would you be to say “no” when someone asks you to:”, followed by examples of substance use behavior such as “smoke a cigarette”. The possible responses choices are labeled at the head of a column of a table with rows labels consisting of the type of substance in question. The responses are measured on a scale from one to five ranging from “Definitely Would” to ““Definitely Would Not”. At first glance, unless the survey taker carefully reads the instructions at the top of the table, ɨ appears that the question is asking whether the responder would use any of the following substances rather than “say no”. There was some ambiguity as to whether the student was endorsing saying no or

using the drug. Thus, it appeared a large proportion of students stated they would categorically *not* say no, intending to state they would not use substances. As a result these data were not interpretable. For all skills variables, means, F-values, significance and effect sizes are reported in Table 9 of Appendix C.

Perceived Peer and Adult Substance Use Norms

Perceptions of both peer substance use and adult substance use were assessed on the LST-Q by asking students to estimate the percentage of either group that use a substance, using a five-point scale ranging from "None" to "All or Almost All". In addition to five different substances, a summary score for peers and adults was calculated. Because students tend to overestimate peer and adult substance use, LST attempts to reduce the perception that substance use is widespread, even normative, by presenting accurate prevalence estimates.

No significant change was determined from pretest to posttest regarding perceived peer substance abuse. However, perceived adult substance use was significantly reduced from pretest to posttest, meaning students showed a significant reduction in how much substance use they thought adults engaged in. This reduction in perceived prevalence is consistent with expectations of LST's effects. All means, F-values, significance and effect sizes are presented in Table 10 of Appendix C

Substance Use and Intention to Use

Current substance use was measured by six questions about the respondent's frequency of use employing a nine-point scale, ranging from 1, "Never", to 9, "More than once a day." In addition, a composite score of the average of responses to the six substances was calculated. Intention to use a substance is assessed using the similar

substances, scale and scores. In both cases, Union-Endicott students reported minimal substance use and intention to use substances. For example, at baseline, 92% of Union-Endicott 6th graders reported never having smoked a cigarette, 98% reported never having "got drunk", and 99% reported never having "got stoned". The same patterns were evident for intention to use substances: the large majority (77%) reported they would "Definitely not" use any substances in the next year, and only very small proportions reported intention to use substances as "More likely than not", the median answer choice. In terms of drinking and marijuana use, 97% and 99% percent respectively reported "Definitely not" intending to use either substance in the coming year. These rates are presented in Table 11 of Appendix C, however, given the redundancy of intention to use with actual use, only the summary intention score is included.

These reports of minimal use and low intention to use created a highly positive skew to the data. Therefore, the McNemar nonparametric test was used to determine if changes between answers were significantly different after LST. No significant differences were found for the use of or intention to use any single substance or the summary scores. This diverges from anticipated findings. Given the very low rates of use in the sample, however, it is possible that substance use in general is so low a base rate phenomenon in Union-Endicott 6th graders that reducing its prevalence would be very difficult to demonstrate statistically, commonly termed a "floor effect". In addition, lack of change in these areas is not necessarily cause for concern since previous research has reported no differences at immediate posttest, but six months later found significant reductions in drinking behavior compared to a control group[7].

Conclusion

In general the pattern of findings in Union-Endicott compares favorably with, and even exceeds, previously reported data on LST implementation[7,8]. Specifically, these findings in part converge with two outcome studies that report immediate LST posttest findings that, while using slightly different variables, showed similar changes in the knowledge domain. In addition, the students in Union-Endicott showed significant increases in Assertiveness Skills, reductions in Perceived Adult Substance Use and meaningful trends toward significance in terms of reduced Pro-Smoking and Pro-Drinking Attitudes and increases in Anxiety Reduction Skills. Given this pattern of findings, it is reasonable to presume that if the program is completed as planned, a similar impact will take place.

ALCOHOL EXPECTANCY QUESTIONNAIRE-ADOLESCENT VERSION (AEQ-A)

The Alcohol Expectancy Questionnaire-Adolescent Version (AEQ-A) contains 90 true-false questions that make up seven scales. In the case of the BCYPP, however, eight questions were eliminated because they were deemed inappropriate for 6th grade students. These questions included seven that constitute Scale IV "Alcohol Enhances Sexuality" and one question from Scale III, "Alcohol Improves Cognitive and Motor Abilities", also relating to sexuality. Thus, the AEQ-A in this case had only 82 items constituting six scales, depicted in the table below.

Alcohol Expectancy Questionnaire-Adolescent Version *(Scale IV removed)*
Scale I Alcohol is a Powerful Agent That Makes Global Positive Transformation
Scale II Alcohol Can Enhance or Impede Social Behavior
Scale III Alcohol Improves Cognitive and Motor Abilities
Scale V Alcohol Leads to Deteriorated Cognitive and Behavioral Function
Scale VI Alcohol Increases Arousal
Scale VII Alcohol Promotes Relaxation or Tension Reduction

Using identical statistical techniques as for the LST-Q analysis, a significant change from pretest to posttest was detected on the AEQ-A, specifically, a significant decrease on Scale VII "Alcohol Promotes Relaxation and Tension Reduction". This significant decrease in beliefs of tension reduction from alcohol suggests that LST does influence substance use expectancies in ways conducive to reducing substance abuse. All means, F-values, significance and effect sizes are presented in Table 12 of Appendix C.

STUDENT PERSPECTIVES

Eighty-five students completed a short questionnaire developed by the BCYPP Information Specialist Team to assess their perspectives of LST. The questionnaire asked open-ended questions about what they liked best and least about LST, which were subsequently organized into predetermined categories. The questionnaire also asked whether they had been in another prevention-type program and, if so, how LST compared to it on several indices.

Students' reports of what they liked the most revealed that almost 37% liked the rehearsal aspect of the program best, 16% liked best the knowledge that they learned, and 12% liked the skills they learned. In addition, 27% favorably cited aspects of the program that didn't fit into a specific category. When asked what they liked least, 27% specifically reported the LST workbook, 12% reported that they least liked practicing something they already knew or found embarrassing, while the largest proportion (49%) reported program aspects that did not fall into any of the expected categories. No students reacted unfavorably to having to sit still or read too much.

As expected, all of the students responded that they had previously participated in DARE, which was compared to LST in the final four questions. In each case the students responded that they were almost equal. Modal responses depict LST as being perceived as slightly more Boring and Foolish, but also slightly more Effective and Understandable. However, there have been no previous efforts to gather data regarding the experience of participating in these programs, nor whether perceived enjoyment of a prevention program relates to actual prevention outcomes. Moreover, feedback from 6th grade

students on their perceived enjoyment of schoolwork may be subject to a substantial negative response bias. All responses and means are reported in Appendix D.

CONCLUSIONS

Taken together, these findings suggest that the implementation of Life Skills Training in Union-Endicott was successful. Statistically meaningful changes in Overall Knowledge, Life Skills Knowledge, Drug Knowledge, Assertiveness Skills, Anxiety Reduction Skills, and Perceived Adult Substance Use all took place in the expected directions and these findings converge with previous outcome studies of LST[7,8]. Although some outcome variables did not change significantly, such as a Perceived Peer Substance Use and Self-Control Skills, statistical nonsignificance for some variables, even the majority, has been reported in previous studies of LST[7,8]. While actual use or intention to use did not change, the 6th graders, resulting in a "floor effect", can best understand this as a function of very low usage in general. In addition to these findings, it was also determined that LST significantly reduced alcohol expectancies related to tension reduction, supporting previous speculations of expectancy change being a mechanism of LST.

Finally, the systematic misunderstanding of the Drug Refusal Skills I scale suggests that the test developers should revise the wording.

In sum, these findings suggest that, as a result of participation in LST, 6th graders in Union-Endicott are likely to demonstrate reductions in otherwise expected substance use during the upcoming years, *assuming continuation of the program*. Previous research has indicated the significant additive effects of booster sessions[8], and for the desired reductions, i.e., preventive benefits, it is critical that the second and third year be implemented with the same quality and fidelity as this first intervention. In addition, it is critical that these two years also be evaluated to ascertain the program's effectiveness. It

is also recommended that any evaluation dovetail with the efforts described herein, for example by using at least the LST-Q and potentially additional measures, such as the AEQ-A. The investment by Union-Endicott School District in undertaking a thorough implementation and evaluation will assess the impact of Life Skills Training, demonstrate the extent of its benefits, and provide the basis for decisions about its longer-term continuation.

GENERAL CONCLUSIONS

The BCYPP Implementation of LST has been successful. LST was implemented in two target school districts and statistically significant changes were found on both knowledge variables and proximal variables purported by LST to prevent substance use. Both interventions were evaluated in terms of their adherence to LST protocol and were highly faithful. In addition, the students' generally evaluated LST as comparable to standard prevention programming. The program was implemented in two different formats, both daily and once a week, and the generally equivalent findings corroborate previous research demonstrating that LST is effective in both formats.

In terms of the constellations of findings, both commonalities and differences were apparent, as depicted in the table on the following page. In both school districts all three knowledge variables significantly increased and perceived adult substance use decreased. In addition, substance use and intention to use did not change, potentially due to very low base rate responses, or a "floor effect". Both groups showed significant increases in self-reported assertiveness, however, students in Maine-Endwell also showed increases in self-reported self-control and use of different strategies to refuse substances, whereas Union-Endicott did not show an increase. However the students in Union-Endicott started with higher levels on these scales and both school districts were comparable in terms of self-reported skill use post LST.

The significant change for Maine-Endwell in self-control and drug refusal skills as compared to no change for Union-Endicott may be related to the different implementation formats, which have been shown to yield similar but not identical results.

Summary and Comparison of Outcomes[16] *Statistically meaningful differences are bolded and checked*	
Maine-Endwell	***Union-Endicott***
Overall Knowledge ✓	**Overall Knowledge ✓**
Life Skills Knowledge ✓	**Life Skills Knowledge ✓**
Drug Knowledge ✓	**Drug Knowledge ✓**
Assertiveness ✓	**Assertiveness ✓**
Anxiety Reduction	Anxiety Reduction
Self Control ✓	Self Control
Drug Refusal Skills I (NA)	Drug Refusal Skills I (NA)
Drug Refusal Skills II ✓	Drug Refusal Skills II
Perceived Peer Substance Use	Perceived Peer Substance Use
Perceived Adult Substance Use ✓	**Perceived Adult Substance Use ✓**
Pro-smoking Attitudes	Pro-smoking Attitudes
Pro-drinking Attitudes	Pro-drinking Attitudes
Pro-marijuana Attitudes	Pro-marijuana Attitudes
Pro-hard drug Attitudes	Pro-hard drug Attitudes
Substance Use	Substance Use
Intention to Use	Intention to Use

In addition, the accumulated research on LST demonstrates that while change typically occurs on certain common variables, such as in the knowledge domain, significant changes in other outcome measures can vary from study to study. Moreover, the posttest results for these scales were comparable. The students in both school districts ended the LST program with the very high levels of self-reported drug refusal and self-control skills, with averages slightly greater than "4" out of 5 possible points.

[16] Reported outcomes that were significant but in an unanticipated direction are not bolded and checked.

In terms of additional measures, various interesting outcomes were determined in both school districts. Although perceived competence has been hypothesized to be one mechanism of action for LST, in Maine-Endwell LST did not influence perceived self-competence, as measured by the PCSC. As described earlier, it is possible that this measure is too broad to capture change over the course of LST, or that perceived competence may not play a role in LST prevention benefits. In terms of alcohol expectancies assessed in Union-Endicott, LST significantly reduced expectancies of tension reduction or relaxation from alcohol as measured by the AEQ-A. This supports the previous hypothesis that challenging positive expectancies may be one form of LST's influence.

In conclusion, the implementation of LST in Maine-Endwell and Union-Endicott School Districts can be considered highly successful. Assuming continuation of the program, those who participated in LST are likely to demonstrate reductions in otherwise expected substance use during the upcoming years. However, given research indicating the significant additive effects of booster sessions[8] on obtaining maximal preventive benefits, it is critical that the second and third year be implemented with the same quality and fidelity as this first intervention. In addition, it is critical that these two years also be evaluated to ascertain the program's effectiveness. It is also recommended that any evaluation dovetail with the efforts described herein, for example by using at least the LST-Q and potentially additional measures, such as the AEQ-A. The investment by Maine-Endwell and Union-Endicott School Districts in undertaking a thorough implementation and evaluation will assess the impact of Life Skills Training, demonstrate

the extent of its benefits, and provide the basis for decisions about its longer-term continuation.

Appendix A. Attendance

Table 1: Maine-Endwell LST Implementation #1 Attendance

Session	Date	Section 1	Section 2	Section 3	Section 7	Section 8	Total	%	Mean
1	11/27/01	17	17	17	18	22	91	0.94	95
2	11/28/01	17	13	16	15	24	85	0.88	89
3	11/29/01	17	16	18	17	25	93	0.96	97
4	12/3/01	16	16	17	19	23	91	0.94	95
5	12/4/01	17	16	18	19	24	94	0.97	98
6	12/5/01	17	15	17	19	25	93	0.96	97
7	12/6/01	16	15	18	18	25	92	0.95	96
8	12/7/01	17	15	18	19	25	94	0.97	98
9	12/10/01	16	16	16	16	23	87	0.90	91
10	12/11/01	16	16	15	16	25	88	0.91	92
11	12/12/01	15	15	17	17	24	88	0.91	92
12	12/13/01	16	15	18	18	23	90	0.93	94
13	12/14/01	17	16	18	17	22	90	0.93	94
14	12/17/01	17	15	17	18	23	90	0.93	94
15	12/18/01	17	16	16	19	23	91	0.94	95
	Maximum	17	17	18	19	25	96		94.46

Table 2. Maine-Endwell LST Implementation #2 Attendance

Session	Date	Section 1	Section 2	Section 3	Section 6	Section 7	Total		
1	2/4/02	16	17	20	22	17	92	0.91	91
2	2/5/02	18	20	20	24	17	99	0.98	98
3	2/6/02	16	18	21	23	17	95	0.94	94
4	2/7/02	18	19	22	22	16	97	0.96	96
5	2/8/02	16	15	19	23	16	89	0.88	88
6	2/11/02	16	19	21	24	16	96	0.95	95
7	2/12/02	15	20	20	21	16	92	0.91	91
8	2/13/02	16	19	19	23	16	93	0.92	92
9	2/14/02	18	18	19	24	16	95	0.94	94
10	2/19/02	17	19	22	20	16	94	0.93	93
11	2/20/02	15	19	20	22	14	90	0.89	89
12	2/21/02	17	20	22	22	15	96	0.95	95
13	2/22/02	17	19	22	19	16	93	0.92	92
14	2/25/02	16	17	22	23	16	94	0.93	93
15	2/26/02	18	19	21	23	16	97	0.96	96
	Maximum	18	20	22	24	17	101		93.13

Table 3. Union-Endicott Life Skills Training Attendance

Date	period	Number Attending	Total Class Size	Percent
2/6/02	1	20	23	87
2/6/02	2	21	23	91
2/6/02	3	24	24	100
2/6/02	5	22	23	96
2/20/02	1	20	23	87
2/20/02	2	18	23	78
2/20/02	3	22	24	92
2/20/02	5	22	23	96
2/27/02	1	23	23	100
2/27/02	2	20	23	87
2/27/02	3	22	24	92
2/27/02	5	23	23	100
3/6/02	1	21	23	91
3/6/02	2	21	23	91
3/6/02	3	21	24	88
3/6/02	5	22	23	96
3/13/02	1	21	23	91
3/13/02	2	21	23	91
3/13/02	3	22	24	92
3/13/02	5	17	23	74
3/20/02	1	20	23	87
3/20/02	2	23	23	100
3/20/02	3	24	24	100
3/20/02	5	21	23	91
4/10/02	1	22	23	96
4/10/02	2	19	23	83
4/10/02	3	22	24	92
4/10/02	5	22	23	96
4/17/02	1	22	23	96
4/17/02	2	22	23	96
4/17/02	3	23	24	96
4/17/02	5	21	23	91
4/25/02	1	19	23	83
4/25/02	2	16	23	70
4/25/02	3	16	24	66
4/25/02	5	17	23	74
4/30/02	1	22	23	96
4/30/02	2	23	23	100
4/30/02	3	20	24	83
4/30/02	5	20	23	87
5/8/02	1	21	23	91
5/8/02	2	20	23	87
5/8/02	3	22	24	92
5/8/02	5	22	23	96
5/16/02	1	21	23	91
5/16/02	2	22	23	96
5/16/02	3	20	24	83

Appendix B. Instrument Reliability and Data Normality

I Maine-Endwell School District

Prior to analyses, all scales on both measures used to assess the intervention were evaluated for internal consistency using Cronbach's coefficient α, a measure of the average inter-item correlations. As described in the text, these scales include different aspects of knowledge, attitudes toward substances, skills acquisition, substance use behavior, and perceptions of peer and adult substance use. As shown on the following page, α's for these scales ranged from very low to extremely high, however the large majority showed low-to-moderate reliability[17] with α's from .6 - .8. None of the scales were substantially improved by the elimination of a single item. One scale is noteworthy of discussion, the Drug Knowledge Scale composed of 13 true-false informational questions showed the lowest alpha, at .13, suggesting that these items are not highly interrelated.

The LST Instruction guide provides previously ascertained reliability data for the drug attitudes and refusal skills scales. Characteristics of the Maine-Endwell data are generally similar to the reported psychometric properties with minor differences. Responses on Pro-Smoking Attitudes and Pro-Drinking Attitudes were slightly more internally consistent, whereas the opposite was the case for Pro-Marijuana Attitudes and Pro-Cocaine/Hard Drugs Attitudes. Both Drug Refusal Skills I and II yielded almost identical results to the reported alphas (.99 vs. .97 and .80 vs. .82).

The Perceived Competence Scale for Children (PCSC) assesses self-competence in five areas, including scholastic competence, social acceptance, athletic competence,

[17] Murphy & Davidshofer (1994). *Psychological Testing: Principles and Applications*

physical appearance, behavioral conduct and global self-worth. All five scales showed moderate to high reliability, yielding α's from .79 to .87. Removing items did not improve reliability. The reliability data for each subscale is presented below.

Cronbach's Coefficient a **for LST-Q and PCSC Scales**

Scale	Coefficient a	Previously Reported a [18]
Overall Knowledge	**.6378**	--
Life Skills Knowledge	**.6288**	--
Drug Knowledge	**.1290**	--
Assertiveness	**.4706**	--
Pro-smoking Attitudes	**.8534**	**.73**
Pro-drinking Attitudes	**.8076**	**.70**
Pro-marijuana Attitudes	**.6307**	**.73**
Pro-hard drug Attitudes	**.6273**	**.73**
Anxiety Management	**.5753**	--
Self Control	**-.6800**	--
Drug Refusal Skills I	**.9874**	**.97**
Drug Refusal Skills II	**.8029**	**.82**
Perceived Peer Use	**.8635**	--
Perceived Adult Use	**.7880**	--
Substance Use	**.7978**	--
Intention to Use	**.8428**	--
Perceived Scholastic Competence	**.7967**	--
Perceived Social Acceptance	**.8246**	--
Perceived Athletic Competence	**.8725**	--
Perceived Physical Appearance	**.8267**	--
Perceived Behavioral Conduct	**.8564**	--
Perceived Global Self-Worth	**.7949**	--

[18] National Health Promotion Associates (2001) *Life Skills Training - Instruction Guide*

II Union-Endicott School District

Prior to analyses, all scales on both measures used to assess the intervention were evaluated for internal consistency using Cronbach's coefficient α, a measure of the average inter-item correlations. As described in the text, these scales include different aspects of knowledge, attitudes toward substances, skills acquisition, substance use behavior, and perceptions of peer and adult substance use. As shown on page 52, α's for these scales ranged from very low to extremely high, however the large majority showed low-to-moderate reliability[17] with α's from .6 - .8. None of the scales were substantially improved by the elimination of a single item. One scale is noteworthy of discussion, the Drug Knowledge Scale composed of 13 true-false informational questions showed the lowest alpha, at .13, suggesting that these items are not highly interrelated.

The LST Instruction guide provides previously ascertained reliability data for the drug attitudes and refusal skills scales. Characteristics of the Union-Endicott data are generally similar to the reported psychometric properties with minor differences. Responses on Pro-Smoking Attitudes and Pro-Drinking Attitudes were slightly more internally consistent, whereas the opposite was the case for Pro-Marijuana Attitudes and Pro-Cocaine/Hard Drugs Attitudes. Both Drug Refusal Skills I and II yielded almost identical results to the reported alphas (.99 vs. .97 and .80 vs. .82).

The Alcohol Expectancy Questionnaire-Adolescent version assesses alcohol expectancies in seven areas. As previously described, 8 items were removed from the scale due to content that was deemed inappropriate for 6th grade students, this included one item from Scale III, "Alcohol improves cognitive and motor abilities", and Scale IV, "Alcohol is sexually enhancing". The six scales used showed moderate to high reliability,

yielding α's from .49 to .80 and removing items did not improve reliability. The reliability data for all the subscales of each measure is presented on the following page.

Cronbach's Coefficient a **for LST-Q and AEQ-A Scales**

Scale	Coefficient a	Previously Reported a [18]
Overall Knowledge	**.5909**	**--**
Life Skills Knowledge	**.5666**	**--**
Drug Knowledge	**.2875**	**--**
Assertiveness	**.4132**	**--**
Pro-smoking Attitudes	**.7477**	**.73**
Pro-drinking Attitudes	**.7158**	**.70**
Pro-marijuana Attitudes	**.7191**	**.73**
Pro-hard drug Attitudes	**.7078**	**.73**
Anxiety Management	**.6443**	**--**
Self Control	**-.4057**	**--**
Drug Refusal Skills I	**.9815**	**.97**
Drug Refusal Skills II	**.6167**	**.82**
Perceived Peer Use	**.8852**	**--**
Perceived Adult Use	**.8648**	**--**
Substance Use	**.4272**	**--**
Intention to Use	**.7373**	**--**
Scale I	**.7739**	**72**[19]
Scale II	**.6363**	**.72**
Scale III	**.4994**	**.72**
Scale V	**.8148**	**.72**
Scale VI	**.5157**	**.72**
Scale VII	**.8009**	**.72**

[19] Mean scale alpha as reported by Brown, Christiansen, & Goldman (1987).

Appendix C. Outcomes Data

Table 1. Maine-Endwell Knowledge Outcomes

Sample Question:

"Alcohol is a Depressant" True False

Variable	Mean (pre)	Mean (post)	F-value	Sig.	$e^{2\dagger}$
Overall Knowledge	.70 (70%)	.78	105.395	<.001	.373
Drug Knowledge	.63	.76	132.717	<.001	.429
Life Skills Knowledge	.73	.78	37.896	<.001	.176

† Eta squared is a measure of effect size, or magnitude of the independent variable's influence. The statistic is the proportion of the total variability in the dependent variable that is accounted for by variation in the independent variable. It is the ratio of the between groups sum of squares to the total sum of squares.

Table 2. Maine-Endwell Attitude Outcomes

Sample Question

"Drinking alcohol lets you have more fun"

Strongly Disagree 1 ***Disagree 2*** ***Neither 3*** ***Agree 4*** ***Strongly Agree 5***

Variable	Mean (pre)	Mean (post)	F-value	Sig.	e^2
Pro-Smoking Attitudes	1.23	1.35	3.140	.078	.018
Pro-Drinking Attitudes	1.23	1.31	1.554	.214	.009
Pro-Marijuana Attitudes	1.16	1.27	3.194	.076	.018
Pro-Hard Drug Attitudes	1.15	1.24	1.550	.215	.009

Table 3. Maine-Endwell Skills Scales Outcomes

Questions: Each question varied based on the skill described but used a scale from 1 to 5, rating how likely the individual would use the skill in question. The higher the score, the more likely the individual would use the skill.

Variable	Mean (pre)	Mean (post)	F-value	Sig.	e^2
Assertiveness	3.56	3.84	26.611	< .001	.11
Anxiety Coping Skills	2.57	2.68	1.984	.161	.01
Self-Control	3.92	4.08	5.572	<.02	.03
Drug Refusal Skills II	4.04	4.30	13.726	< .001	.072

Table 4. Maine-Endwell Estimated Substance Use By Peers and Adults

Sample Question:
How many people your age do you think use cocaine or other hard drugs?

None 1 ***Less Than Half 2*** ***About Half 3*** ***More Than Half 4*** ***Almost All 5***

Variable	Mean (pre)	Mean (post)	F-value	Sig.	e^2
Estimated Peer Cigarette Use	1.88	2.05	8.919	<.01	.05
Estimated Peer Alcohol Use	1.80	1.97	8.192	<.01	.05
Estimated Peer Marijuana Use	1.50	1.64	6.611	<.05	.04
Estimated Peer Hard Drug Use	1.37	1.49	5.738	<.05	.03
Estimated Peer Inhalant Use	1.78	1.94	5.843	<.05	.03
Overall Perception of Peer Norms	1.66	1.82	13.85	< .001	.08
Estimated Adult Cigarette Use	3.34	2.86	52.428	< .001	.24
Estimated Adult Alcohol Use	3.72	3.3	34.470	< .001	.17
Estimated Adult Marijuana Use	2.20	2.06	5.474	< .05	.03
Estimated Adult Hard Drug Use	2.16	2.01	6.132	< .05	.04
Estimated Adult Inhalant Use	2.07	1.91	5.843	< .001	.03
Overall Perception of Adult Norms	2.7	2.43	36.961	< .001	.18

Table 5. Maine-Endwell Substance Use Behavior and Intention to Use

Sample Question:

About how often (if ever) do you drink until you get drunk?

Never	A few times but not in the past year	A few times per year	Once a month	A few times a month	Once a week	A few times a week	Once a day	More than once a day
1	2	3	4	5	6	7	8	9

Variable	Mean (pre)	Mean (post)	Prevalence (% Never)	Sig.
Cigarettes	1.16	1.20	93.7%	Ns
Alcohol	1.35	1.38	78.4%	Ns
Get Drunk	1.07	1.07	98.4%	Ns
Marijuana	1.01	1.05	96.8%	Ns
Get Stoned	1.00	1.11	99.5%	Ns
Sniff Glue	1.07	1.12	97.4%	Ns
Composite Substance Use Mean	1.11	1.15		1.00 (Ns)
Composite Intention to Use Mean	2.57	2.68		.571 (Ns)

Table 6. Maine-Endwell Perceived Competence Scale for Children Outcomes

Sample Question[10]:

"What I Am Like"

1	**2**	*Some Kids find it hard to make friends*	**BUT**	*Other Kids find it's pretty easy to make friends*	**3**	**4**

Variable	Mean (pre)	Mean (post)	F-value	Sig.	e^2
Scholastic Competence	2.90	3.02	1.204	.275	.013
Social Acceptance	2.90	3.00	1.118	.293	.012
Physical Appearance	2.87	2.97	.997	.321	.011
Behavioral Conduct	2.72	3.10	.668	.416	.007
Global Self-Worth	3.10	3.24	.302	.584	.003

Table 7. Union-Endicott Knowledge Outcomes

Sample Question:

"Alcohol is a Depressant" **True** **False**

Variable	LST Group Mean (pre)	LST Group Mean (post)	F-value	Sig.	$e^{2\dagger}$
Overall Knowledge	.69 (69%)	.77	51.665	<.0001	.425
Life Skills Knowledge	.74	.79	19.288	<.0001	.216
Drug Knowledge	.62	.73	65.592	<.0001	.484

† Eta squared is a measure of effect size, or magnitude of the independent variable's influence. The statistic is the proportion of the total variability in the dependent variable that is accounted for by variation in the independent variable. It is the ratio of the between groups sum of squares to the total sum of squares.

Table 8. Union-Endicott Attitude Outcomes

Sample Question

"Drinking alcohol lets you have more fun"

Strongly Disagree	*Disagree*	*Neither*	*Agree*	*Strongly Agree*
1	*2*	*3*	*4*	*5*

Variable	LST Group Mean (pre)	LST Group Mean (post)	F-value	Sig.	e^2
Pro-Smoking Attitudes	1.34	1.26	3.434	.068	.047
Pro-Drinking Attitudes	1.31	1.22	3.168	.079	.043
Pro-Marijuana Attitudes	1.29	1.20	2.392	.126	.033
Pro-Hard Drug Attitudes	1.24	1.17	1.971	.171	.079

Table 9. Union-Endicott Skills Scales Outcomes

Questions: Each question varied based on the skill described but used a scale from 1 to 5, rating how likely the individual would use the skill in question. The higher the score, the more likely the individual would use the skill.

Variable	LST Group Mean (pre)	LST Group Mean (post)	F-value	Sig.	e^2
Assertiveness	3.65	3.94	5.992	<.02	.079
Anxiety Reduction Skills	2.54	2.87	3.312	<.08	.045
Self-Control	4.11	4.10	.004	.947	.000
Drug Refusal Skills II	4.42	4.44	.051	.823	.001

Table 10. Union-Endicott Estimated Substance Use By Peers and Adults

Sample Question:
How many people your age do you think use cocaine or other hard drugs?

None	*Less Than Half*	*About Half*	*More Than Half*	*Almost All*
1	*2*	*3*	*4*	*5*

Variable	LST Group Mean (pre)	LST Group Mean (post)	F-value	Sig.	e^2
Overall Perception of Peer Norms	1.79	1.80	.585	.447	.008
Overall Perception of Adult Norms	2.88	2.61	13.882	<.0001	.165

Table 11. Union-Endicott Substance Use Behavior and Intention to Use

Sample Question:

About how often (if ever) do you drink until you get drunk?

Never	A few times but not in the past year	A few times per year	Once a month	A few times a month	Once a week	A few times a week	Once a day	More than once a day
1	2	3	4	5	6	7	8	9

Variable	LST Mean (pre)	LST Mean (post)	Sig.	Overall Pretest Prevalence (% Never)
Cigarettes	1.10	1.18	1.0 (Ns)	92%
Alcohol	1.37	1.25	1.0 (Ns)	82%
Get Drunk	1.02	1.01	1.0 (Ns)	98%
Marijuana	1.12	1.01	1.0 (Ns)	99%
Get Stoned	1.10	101	1.0 (Ns)	99%
Sniff Glue	1.02	1.04	1.0 (Ns)	96%
Composite Substance Use Mean	1.12	1.09	.508 (Ns)	78%
Composite Intention to Use Mean	1.16	1.15	.607 (Ns)	"Definitely Not" 77%

Table 12. Alcohol Expectancy Questionnaire – Adolescent Version Outcomes

Sample Question[10]:

1. True False "Drinking alcohol makes a person feel good and happy"

Scale	LST Mean (pre)	LST Mean (post)	F-value	Sig.	e^2
I Alcohol is a powerful agent that makes global positive Transformation (0-15)	4.16	4.19	.020	.888	.000
II Alcohol can enhance or impede social behavior (0-17)	2.77	2.95	.374	.542	.004
III Alcohol improves cognitive and motor abilities (0-9)	.45	.60	.911	.343	.010
V Alcohol leads to deteriorated cognitive and behavioral function (0-24)	20.8	20.17	1.325	.253	.015
VI Alcohol increases arousal (0-4)	1.66	1.60	.383	.538	.004
VII Alcohol promotes relaxation or tension reduction (0-13)	6.66	5.67	10.508	<.003	.109

Appendix D. Student Evaluation of Life Skills Training

Table 1. Maine-Endwell School District

Question	Rehearsal	Coping/Refusal Skills	General Knowledge	Other	Nothing	
What did you like best about LST?	42.6%	5.6%	13.9%	26.9%	11.1%	
	Sitting too long	Reading	Workbook	Practicing Something Already Known	Practicing Something Embarrassing	Other
What did you like least about LST?	.9%	6.5%	30.8%	4.7%	5.6%	51.4%
Please compare LST to DARE on the following questions:						
	1. Much More	2. Somewhat More	3. A Little More	4. A Little Less	5. Somewhat Less	6. A Lot Less	Mean
Boring	40.4%	15.2%	23.2%	10.1%	4.0%	7.1%	2.43
	1. A Lot Less	2. Somewhat Less	3. A Little Less	4. A Little More	5. Somewhat More	6. Much More	
Effective[20]	10.2%	15.3%	24.5%	25.5%	11.2%	13.3%	3.52
	1. Much More	2. Somewhat More	3. A Little More	4. A Little Less	5. Somewhat Less	6. A Lot Less	
Foolish	14.9%	8.5%	27.7%	21.3%	14.9%	12.8%	3.51
	1. A Lot Less	2. Somewhat Less	3. A Little Less	4. A Little More	5. Somewhat More	7. Much More	
Understandable	18.6%	8.2%	22.7%	24.7%	13.4%	12.4%	3.43

[20] Note item reversal for Effective and Understandable.

Table 2. Union-Endicott School District

Question	Rehearsal	Coping/Refusal Skills	General Knowledge	Other	Nothing	
What did you like best about LST?	37%	12%	16%	27%	9%	
	Sitting too long	Reading	Workbook	Practicing Something Already Known	Practicing Something Embarrassing	Other
What did you like least about LST?	0%	0%	27%	12%	12%	49%
Please compare LST to DARE on the following questions:						
	1. Much More	2. Somewhat More	3. A Little More	4. A Little Less	5. Somewhat Less	6. A Lot Less	Mean
Boring	19%	16%	24%	20%	12%	10%	3.19
	1. A Lot Less	2. Somewhat Less	3. A Little Less	4. A Little More	5. Somewhat More	6. Much More	
Effective[21]	7%	11%	25%	28%	18%	11%	3.71
	1. Much More	2. Somewhat More	3. A Little More	4. A Little Less	5. Somewhat Less	6. A Lot Less	
Foolish	7%	9%	34%	27%	11%	12%	3.62
	1. A Lot Less	2. Somewhat Less	3. A Little Less	4. A Little More	5. Somewhat More	7. Much More	
Understandable	10%	12%	23%	37%	7%	11%	3.53

[21] Note item reversal for Effective and Understandable.

Appendix E. Outcome Instruments

I Life Skills Training –Questionnaire (LST-Q)

This document is not publicly available in an electronic form, but can be obtained by contacting:

National Health Promotion Associates, Inc.

Toll-free: 1-800-293-4969
Phone: (914) 421-2525
Fax: (914) 683-6998
Email: lstinfo@nhpanet.com

Additional information about Life Skills Training can be found at:

www.lifeskillstraining.com

Student Evaluation of LST Program

1. What did you like best about the Life Skills Training Program?

_____
_____

2. What did you dislike the most about the Life Skills Training Program?

_____
_____

3. Have you ever been in another program like the Life Skills Training Program?

_____ YES _____ NO

4. What programs have you been in? (Check all that apply)
   _____ DARE
   _____ Growing Healthy
   _____ Child Abuse Prevention (CAP)
   _____ Youth Abuse Prevention (YAP)
   _____ Other (What was it called?) _____

5. Pick **one** program that you partic ipated in from question two and please compare the Life Skills Training Program to that Program for the following questions.

Name of program from question 2 _____

Compared to _____ (program from question 2), Life Skills Training was:

1	2	3	4	5	6
Much More Boring	Somewhat more boring	A Little More Boring	A Little Less Boring	Somewhat Less Boring	A Lot Less Boring

1	2	3	4	5	6
Much More Effective	Somewhat More Effective	A Little More Effective	A Little Less Effective	Somewhat less effective	A Lot Less Effective

1	2	3	4	5	6
Much More Foolish	Somewhat More foolish	A Little More Foolish	A Little Less Foolish	Somewhat less foolish	A Lot Less Foolish

1	2	3	4	5	6
Much More Understandable	Somewhat more understandable	A Little More Understandable	A Little Less Understandable	Somewhat less understandable	A Lot Less Understandable