

# **A Cost-Benefit Analysis of Arts Education for At-Risk Youth**

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## **Summary**

Arts education has become a *cause celebre* in recent years, attracting endorsements from popular artists, politicians, and corporate America alike. However, despite this publicly voiced enthusiasm, funding for arts education programs is still woefully inadequate. As the economy begins to weaken and a new administration tightens the nation's budget, history tells us that the arts may once again be seen as an expendable luxury for public education.

Recently, there have been several efforts to bolster the claim that arts education provides multifaceted benefits beyond the ability to play an instrument, paint, dance, or perform theater. Hundreds of studies have suggested the arts' capacity for enhancing prosocial behavior and academic achievement. However, few of these studies utilize the kind of sound methodologies and careful evaluations necessary to withstand scrutiny. For this reason, several major organizations, including RAND and the U.S. Department of Justice, have taken it upon themselves to perform rigorous studies of the effects of arts education.

Based on the data from these new efforts, this study estimates the costs and benefits of providing quality arts education for the most disadvantaged children in California. These calculations suggest that by implementing strong arts programs for "at-risk" 4<sup>th</sup> through 12<sup>th</sup> graders, the state can recover one and a half times its investment through savings to the criminal justice system and increased tax revenue.

## **Introduction**

Everyone from the entertainment industry to the Oval Office has jumped on the arts education bandwagon in recent years. Celebrities and politicians alike embrace the belief that, as actress and former National Endowment for the Arts head, Jane Alexander, once said, "If you put

a paintbrush or oboe in the hands of a 7 year-old, that same child, at the age of 13, will not pick up an Uzi (Farnum 1998).” Even former President Bill Clinton has publicly credited his rise to the Presidency on the foundation given him by learning the saxophone.

Corporate America has also joined the movement. Large, non-arts related companies such as Folgers Coffee, Texaco, and Edison International have high-profile grant programs to strengthen arts education throughout the United States. Viacom’s VH-1 Save the Music Foundation leverages the talent and good will of mega-stars such as Mariah Carey, Elton John, and U2 to bolster music education programs in inner-city schools. The arts education saga has even been brought to the big screen in movies such as *Music of The Heart* and *Mr. Holland’s Opus*, where art programs are cut from school budgets just to be heroically saved in the 11<sup>th</sup> hour by enlightened teachers. But those are fictitious plots and outcomes that do not regularly occur in real life. The true story has a much different outcome.

Though many influential people say they are supportive of art education, few are really committed to paying for its implementation. In Europe, the average annual expenditure for art education is \$5.00 per child. New York and Michigan spend \$2.45 per child per year. And in California, where the arts have spawned a global industry, a mere \$0.97 is spent per child each year. The Los Angeles Unified School District, which trumpeted its far-reaching 10-year arts plan in 1999, is spending \$16.00 per child in the current year to offer programming in each of the four disciplines: music, dance, drama, and fine art (Burrows 2001). The LAUSD “commitment” (no future budget allocations are actually guaranteed) is a relatively exorbitant investment, but is it even enough—or rather, could society gain more by investing more?

## **Quality Arts Education**

In 1996, RAND published the first of three reports from its Arts and Prosocial Impact Study (APSYS), a far-reaching effort “to demonstrate decisively that fine-arts programs can contribute in quantifiable and positive ways to solving important social problems such as crime and violence (Stone 1997).” The reports inventory and analyze the arts programs most likely to promote prosocial development. For the purposes of this study, this will be the benchmark for quality in arts education. The most recent report outlines the five program features most strongly associated with such quality (Stone 1998). They are:

- Extended time-in-program. Program allows participants to repeat classes and offers ongoing sessions that continue indefinitely.
- Complementary program components. Program provides additional programming beyond arts such as counseling sessions, tutoring and computer labs.
- Ties with other community organizations. Programs interface on regular meaningful basis with community organizations such as schools, other arts programs, youth service agencies, and community centers.
- Youth mentorship opportunities. Program facilitates the creation and maintenance of positive and supportive peer-to-peer relationships. Mentors are typically program graduates.
- Emphasis on performance and presentation. Program emphasizes end-of-session presentation that typically involves weeks of preparation culminating in performance in front of adults and peers.

Clearly, this is more than the weekly recorder lesson or papier-mâché project available in public schools that have arts programs. And it costs more as well!

## **Cost of Quality Arts Education**

The first report of RAND’s APSIS provides an inventory of 28 programs most likely to have prosocial impact (McArthur 1996). Based on the costs of these programs, as well as the cost of the three programs encompassed by the Department of Justice’s YouthARTS

Development Project (discussed below), we found the average cost of a quality arts education program to be \$498 per child per year (see Appendix A). [Note: All monetarized figures are in 2001 dollars.] This figure represents the weighted average of all the program costs, i.e. the combined total cost of all the programs divided by the total number of participants encompassed by all the programs. Using the weighted average captures the benefits of scale, which are dramatically illustrated in Appendix B.

Nevertheless, even with benefits of scale, \$498 is more than 500 times the state's current investment in arts education. Can it possibly be worth it? More specifically, this study aims to determine the costs and benefits—from the state's perspective—of providing quality arts education to 4<sup>th</sup> through 12<sup>th</sup> graders in the bottom socio-economic quartile.

### **Benefits of Arts Education**

The purported benefits of arts education have been documented in hundreds of studies. Harvard's Project Zero recently analyzed 188 reports related just to academic improvement and the Association for the Advancement of Arts claims to have found nearly 400 studies. The measured outcomes generally fall into one of two categories: prosocial development and academic achievement. Some of the indicators of prosocial development include:

- Better discipline
- Increased self-esteem
- Reduced truancy
- Better relations with adults
- More hope for the future
- Increased motivation
- More positive peer associations
- Less interest in drugs
- More resistant to peer pressure
- Reduced criminal activity

Measures of academic achievement include:

- Improved math ability
- Improved reading comprehension
- Improved language skills
- Increased interest in social studies
- Improved spatial-temporal reasoning
- Higher high school graduation rate

For the purposes of this study, we have selected one measurable outcome for each type of benefit. Prosocial development will be measured by reduction in criminal activity, and academic achievement will be represented by reduction in high school drop out rates.

### **Reduction in Criminal Activity**

“Young people who are involved in making something beautiful today are less likely to turn to acts of violence and destruction tomorrow.” Janet Reno, former Attorney General (Farnum 1998).

For many years, anecdotal accounts have fueled the intuition that the arts can have a positive effect on the behavior of at-risk youth. While arts advocates seized upon these reports as evidence supporting their claims, sympathetic academicians and policy analysts were frustrated by the lack of scientific evaluation. In response, several efforts arose in the mid-1990s to put facts and figures to the appealing but unsubstantiated belief that, in the words of one popular bumper sticker, “Art Saves Lives.” RAND’s APSIS, noted above, is in the midst of its final stage—a longitudinal, multi-city field experiment tracking the impact of arts interventions on at-risk youth.

The most complete and well-designed analysis of arts education to date comes from the YouthARTS Development Project, a collaboration of the U.S. Department of Justice, National Endowment for the Arts, Americans for the Arts, and local governmental and nonprofit entities in three cities. The study encompassed arts-based prevention and intervention programs in Atlanta, San Antonio, and Portland, Oregon that share a common focus on reducing the *risk factors* for antisocial behavior (e.g. social alienation, early school failure) and increasing the *protective factors* that help youths stay out of trouble (e.g. positive peer associations,

communications skills). Ultimately, these outcomes were expected to result in reduced delinquent and criminal behavior.

The detailed evaluation report of the YouthARTS program was published in November 2000, and suggested the programs had a variety of positive impacts on youth attitudes and behaviors. In respect to criminal activity, the highlights include:

- In Portland, only 22 percent of the arts program participants had a new court referral compared to 47 percent of the comparison youth. The level and type of offense committed during the program period were less severe than prior offenses.
- In Atlanta, despite the fact that the arts program participants had, on average, more court referrals than the comparison group at the start of the program (6.9 and 2.2 referrals, respectively), they had, on average, fewer court referrals during the program period than the comparison group (1.3 and 2.0 respectively). Moreover, a smaller proportion of the arts participants committed new offenses during the program period than the control group (50 percent vs. 78.6 percent).
- In San Antonio, where the program focused on pre-adolescents (10 to 12 years of age), only 3.5% of participants committed a delinquent offense in the 22 months following program completion.

Based on the sample size and methodology, the evaluators considered this last result to be the most significant and declared that this program was successful as a “primary prevention” initiative. However, no data was given for a comparison group to quantify the degree of this preventive effect.

The results of the YouthARTS programs do not clearly suggest the correct level of crime prevention to include in this cost-benefit analysis. The framework for providing arts education envisioned by this analysis is in some ways much stronger than these pilot programs: nine years of quality programming beginning in the fourth grade versus, in the YouthARTS programs, a maximum of two years of programming focused on older youths (14 – 16 year olds in Atlanta and Portland). The length of program involvement as well as the age at which an intervention begins are significant factors influencing its efficacy. Based on the available data, the prosocial

impacts widely observed by educators, retrospective studies correlating high arts involvement with lowered risk factors (e.g. dropping out of school—discussed below), and efficacy rates of other interventions (noted in the following section) we selected a pilot program crime prevention rate of 50 percent.

### **Monetary Benefit of Crime Reduction**

To translate this 50 percent figure to a monetarized benefit, we borrowed the framework of RAND’s *Diverting Children from a Life of Crime* (Greenwood 1996). This study induces the effectiveness of four fully implemented crime interventions from the success of representative pilot projects. The primary variables in converting pilot program efficacy to “real world” impacts are:

- Penalty for scale up. This is the reduction in effectiveness due to the belief that small scale pilot projects are fundamentally more effective than large-scale programs. The percentage penalty for scale up is reduced from 100% and multiplied by the pilot program effectiveness rate. For example, a 0% penalty means that the pilot program effectiveness is perfectly maintained after wide-scale implementation. A 40% penalty means that the full-scale program is only 60% as effective as the pilot.
- Decay for adult crime. Certainly, a program is more influential on behavior when one is immersed in it than after one leaves. Since, by definition, all childhood crime interventions end at adulthood, an additional percentage penalty is applied to the effectiveness rate. [Note: the RAND study includes a decay penalty for juvenile crime as well, since several of the interventions examined end during childhood. However, the baseline case for this study supposes arts education through the 12<sup>th</sup> grade. Therefore, its effect on juveniles does not decay.]
- Targeting ratio. An essential concept, the targeting ratio captures the reality that having proportionally more potential criminals in your cohort will make your program more effective at reducing crime. A targeting ratio of 2 means that the participants in your program are twice as likely to be criminals than the population as a whole. Naturally, the ability to target a program to the population most at-risk has a dramatic effect on its cost-effectiveness.

To give some perspective on the numbers we applied to arts education, we have juxtaposed it to the values given to the interventions in the RAND study. The details of these interventions are

not important, except to note that their timing ranges from pre-natal and early childhood to high school.

	Home Visits/ Day Care	Parent Training	Graduation Incentives	Delinquent Supervision	<b>Arts Education</b>
Pilot Prevention Rate	50	60	70	10	<b>50</b>
Penalty for scale-up	40	40	20	15	<b>40</b>
Decay for Juvenile Crime	20	20	0	0	<b>0</b>
Decay for Adult Crime	70	70	10	5	<b>10</b>
Effective rate: Juvenile Crime	24	29	56	8	<b>30</b>
Effective rate: Adult Crime	9	11	50	8	<b>27</b>
Targeting Ratio	2	2	3	4.5	<b>2</b>

The rationale for the arts education rates followed the reasoning of the RAND study. The scale-up penalty is based on the relative size of the population the intervention is intended to reach. The larger the intended cohort, the larger the penalty (i.e. the more the effect of the program is diminished). The adult crime penalty is based on how much before adulthood the intervention ceases. Obviously, an early childhood intervention will be less meaningful to an 18 year-old than a program that has ended at high school graduation.

The targeting ratio largely depends on the age at which the intervention is administered and whether or not it is meant for primary prevention. Some interventions, such as Delinquent Supervision, are not applicable until a youth actually commits an offense. In that case, the percent of likely criminals in the cohort is 100 percent—equivalent to a targeting ratio of 4.5 (based on crime rates at the time of the study). For interventions seeking *primary* prevention for at-risk populations, one must cast a wider net to reach all the potential criminals. Day care or parental training come before it is known whether a child has antisocial behavior. Therefore, targeting ratios for those interventions are based on the percentage of criminals in a relatively broad demographic or geographic sector.

Our study envisions arts education in neighborhoods or schools with the greatest proportions of at-risk youth. Based on the perspective of the RAND study, this cohort, which we define as the bottom quartile of students, might reasonably be assumed to have twice the level of criminality of the population as a whole. Certainly, the YouthARTS programs were much more focused than this, demonstrating that arts interventions can be applied selectively to the most needy populations.

Given this framework, the formula used for calculating the crime reduction benefits of arts education is as follows (see Appendix C for additional explanation):

Juvenile Crime Prevention:

$$(\text{pilot prevention rate}) \times (100 - \text{scale-up penalty}) \times (\text{serious crimes per average juvenile}) \times (\text{targeting ratio}) \times (\text{cost per juvenile crime})$$

The cost of juvenile crime includes the costs associated with arrest and adjudication and is taken from RAND’s follow-up study, *Investing In Our Children* (Karoly 1998). The product of this equation is the total costs saved for the entire juvenile career of an average program participant. For our study, it is equally divided across the four years (age 14 – 17) that represent this period. Since the Greenwood study did not contemplate criminal careers prior to the age of 14, we have ignored them as well. Applying the data, this formula yields the following:

$$(50\%) \times (100\% - 40\%) \times (0.61) \times (2) \times (\$2,377) = \$870.$$

Cost savings due to prevention of juvenile crime per year  $(\$869.98/4) = \$217.50$

Adult Crime Prevention:

$$(\text{pilot prevention rate}) \times (100 - \text{scale-up penalty}) \times (100 - \text{adult decay penalty}) \times (\text{percent of adult offenders in the population}) \times (\text{targeting ratio}) \times (\text{cost of adult criminal career})$$

The fundamental cost unit for this calculation is the criminal career of an average adult offender. This includes the costs of arrest, adjudication and incarceration, and is based on full implementation of the three strikes law. The figure, which comes from a previous study, is the lump sum of benefits accrued over the lifetime of a criminal discounted at 4%. It is accrued at the beginning of a criminal career (i.e. at participant age of 18). Applying the appropriate data yields:

$$(50\%) \times (100\% - 40\%) \times (100 - 10\%) \times (22.04\%) \times (2) \times (\$57,698) = \$6,867$$

Therefore, the total costs saved by arts education's impact on reducing crime in 2001 dollars, undiscounted, are \$7,737 per average participant (\$870 juvenile + \$6,867 adult).

### **Reduced Dropout Rate**

Arts education has been associated with numerous positive impacts on academic achievement. But what are the monetary benefits of modest gains in math or language skills? No one claims that learning the violin will turn a low math achiever into a highly employable nuclear physicist. However, becoming more proficient in academic pursuits makes those pursuits themselves more enjoyable, less frustrating and less likely to drive a student away from formal education. Therefore, we are lumping all impacts on academic achievement into art education's effect on high school drop out rates.

The best data on this comes from The Imagination Project at UCLA's examination of the National Educational Longitudinal Survey, or NELS:88 as it is known (Catterall 1999). The NELS:88 is a study that has followed more than 25,000 students in American secondary schools for 10 years. Among many other positive correlations between arts involvement and academic achievement, Catterall finds that those involved in the arts drop out in fewer numbers.

Specifically, among 8<sup>th</sup> graders with the lowest parent education and income, those with high arts involvement drop out before 10<sup>th</sup> grade at a rate of 3.5%; those with low arts involvement drop out at a rate of 6.5%. Although correlation is not causation, this drop is in line with other publicized (if not scientifically proven) accounts of the impact of installing quality arts programs in schools (Mr. Holland’s Opus Foundation). Even those who are skeptical about the arts’ ability to improve individual performance, grant that arts programs do seem to have a positive effect on schools (Winner 1999). Therefore, we accept 3% as the number of would-be dropouts who graduate high school due to their involvement in the arts.

### **Monetary Benefits of Not Dropping Out**

High school graduates earn more than those who do not graduate and rely less on public support such as welfare. Consequently, graduates contribute larger amounts of income tax and take less from the public coffers. A RAND study, *The Social Returns to Increased Investment in Education* (Krop 1998), calculates the specific impact of each level of academic achievement (i.e. high school, college) on a variety of public revenues and expenditures. For the purpose of this study, we rely on the estimates for additional state and federal taxes, as well as savings from welfare.

The Krop study calculates the additional state taxes—including sales, excise, and property taxes along with income taxes—that an average 30 year-old would pay solely based on the additional earnings one would have from graduating high school. Although the study is not specific to California, Californians are taxed at higher levels than the rest of the country—making this a conservative estimate. (According to U.S. Census data, California ranks 9<sup>th</sup> in taxes paid per capita.) The study breaks down the additional taxes by ethnicity and immigrant

status. For the purposes of our study, we used a straight average of these amounts, \$340, as the basis for calculation. Since minorities generally benefited more from high school graduation than whites, this unweighted average likely underestimates the benefit (see Appendix D).

A similar approach was used for the increased tax revenue (\$698) and welfare savings (\$477) at the federal level. However, since our study is focused on the costs and benefits accrued to the state of California, we multiplied these figures by 12%, thus prorating them by the proportion of the nation's population that lives in the state—roughly California's "fair share" of federal spending.

The total benefit (\$481) was then multiplied by 3% to account for the proportion of the cohort population who would realize this benefit, or rather, the contribution of an average member of the cohort. The result (\$14.43) was applied to every year from age 25 to 65. In reality, according to the Krop study, the tax benefits rise until age 45 and then fall at roughly the same rate. Since the figure applied is for an average 30 year-old, this likely underestimates the total benefit.

### **Cost-Benefit Calculation**

The baseline framework for this study is quality arts education provided to the bottom quartile (socio-economically speaking) of California's school children from 4<sup>th</sup> grade through 12<sup>th</sup> grade, or age 9 through 17. A discount rate of 4% was used in order to be consistent with Greenwood's cost estimate for an adult criminal career. In actuality, since we are focused on a state investment, the proper discount rate would be calculated from the municipal bond rate adjusted for inflation. Based on current rates, this would be approximately 2.8%. Since we are

making an upfront investment in children to achieve a future gain, a lower discount rate would raise the net benefits. Nevertheless, the discounted totals are as follows:

Program Cost:	(\$ 3,851)
Crime Benefit:	\$ 5,500
<u>Tax/Welfare Benefit:</u>	<u>\$ 160</u>
Net Present Value:	\$1,809
Benefit/Cost Ratio:	1.47

Based upon the baseline values, quality arts education can return \$1.47 in direct cost savings and additional revenue to the state for every \$1 invested (see Appendix E).

### Sensitivity of Values

Naturally, a broad analysis of this kind relies on estimates and assumptions that should not be mistaken for precise determinations of program costs or benefits. The following table presents the threshold for critical values at which the net present value becomes negative and the benefit-cost analysis falls below one.

Item	Baseline	Threshold	Difference from Baseline
Program Cost	\$498	<\$730	\$232
Effectiveness for Crime prevention	50%	>34%	16%
Targeting Ratio	2.0	>1.35	0.65
Cost of Adult Criminal Career	\$57,698	>\$36,500	\$21,198
Scale-Up Penalty	40%	<59%	19%
Adult Decay Penalty	10%	<43%	33%
Effectiveness for Dropout Prevention	3%	NA	NA

As illustrated, the cost of delivering arts programs could rise by nearly 50% and still provide a net benefit to the state—assuming all other values are held constant. Likewise, the pilot program effectiveness may fall as low as 34% and the program will still be worthwhile. Perhaps the most interesting finding is that the arts programs—by virtue of the targeting ratio

threshold—must be focused on at-risk youth in order to have a positive return on investment. This is not surprising, since benefits only come from serving those who are in need; the more in need the greater the likelihood of having a positive impact. However, this is important since it squarely puts the focus on bringing arts education to the disadvantaged. In well-off school districts, parents already pool their own resources to provide quality arts programming. Without a strong case for public investment in poorer communities, “we are going to end up with a cultural caste system where only the rich can afford access to [arts] education (Kantrowitz 1997).”

### **Limitations of this Analysis**

Although every effort has been made to be conservative in assumptions regarding the monetary benefits of arts education, the breadth of this analysis leaves room for doubt. Under the rubric of arts education, we have lumped a vast diversity of programs. While we average out their costs, we apply benefits selectively—presuming that such gains can be achieved across the board at the average price. This may be, but it may not. There is simply not enough data to know at this time.

Furthermore, to make the assertion that “arts education is a good investment” is only the beginning of a complex planning process. Programs must be designed to reach the target population. Forming a ballet troupe for hardcore male gang members may not be as effective as other art-based interventions, such as music lessons or public fine art projects. There may also be significant practical obstacles to implementing arts education on the scale suggested by this study. For instance, there is already a shortage of school teachers. Who will run these programs? What is the state’s personnel capacity for staffing intensive art programs?

Additionally, this study has not contemplated initial capital expenses such as instruments or theater construction that are essential for program implementation.

## **Conclusion**

There exists significant interest and capacity in the private sector for providing arts education to children. Today, hundreds of small nonprofits rely on the support of individuals, foundations, and corporate sponsors to bring programming to at-risk populations. However, the need far exceeds the available resources. Under the framework of this analysis, it would cost nearly \$60 million to provide just one year of programming to 25% of California's 4<sup>th</sup> graders (Appendix F)! Full scale implementation would cost more than half a billion dollars a year! Even with private dollars fully leveraged, government investment is clearly required. This analysis demonstrates that the state can benefit directly, in financial terms, from an investment in arts education dramatically larger than it currently commits.

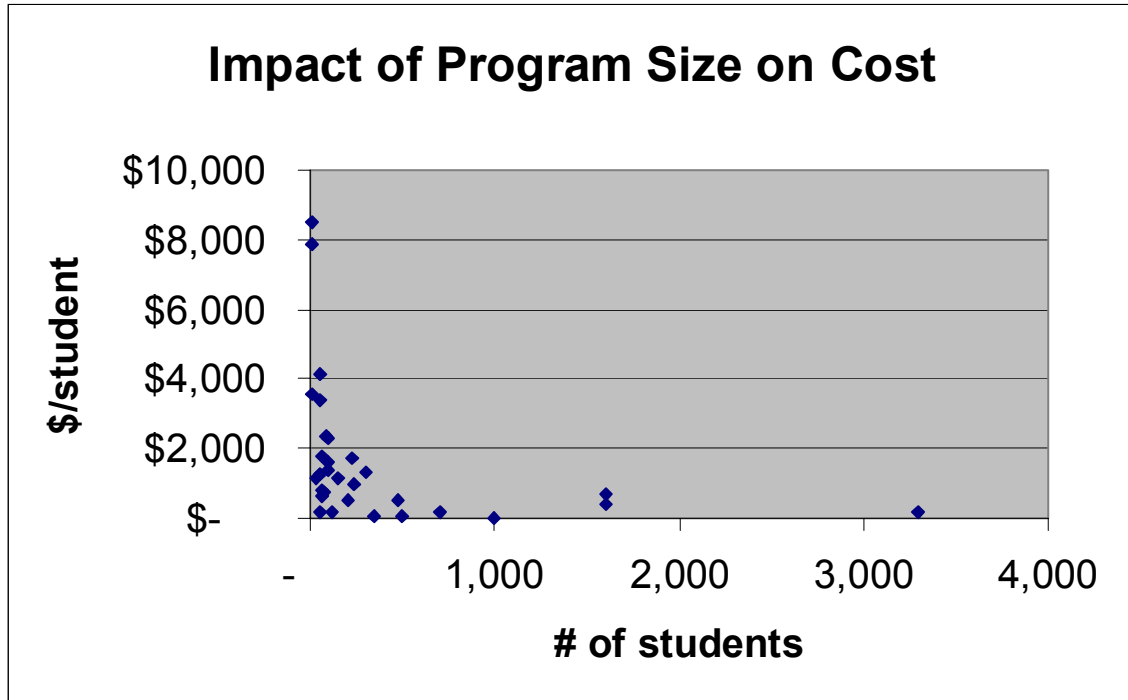
**Appendix A**  
**Cost of Arts Education**

<b>Program Name</b>	<b>2001 Dollars</b>	<b>Total Students</b>	<b>\$/Student</b>
Arts Train	\$ 25,029	1,000	\$ 25
Arts Talk	\$ 62,572	50	\$ 1,251
YMCA	\$ 229,711	240	\$ 957
Youth Leadership	\$ 37,922	60	\$ 632
Japantown	\$ 170,650	50	\$ 3,413
Dunham Museum	\$ 56,883	75	\$ 758
Arts for Prevention	\$ 39,818	500	\$ 80
Public Housing	\$ 113,767	64	\$ 1,778
I Do Dance	\$ 227,533	100	\$ 2,275
Inner Voices	\$ 104,097	210	\$ 496
Studio and College	\$ 659,847	1,600	\$ 412
United in Hope	\$ 21,388	118	\$ 181
MECA	\$ 513,088	3,300	\$ 155
DanceChance	\$ 68,260	55	\$ 1,241
Color Me Bright	\$ 25,028	7	\$ 3,575
East Bay Center	\$ 1,108,088	1,600	\$ 693
ROCA	\$ 170,650	150	\$ 1,138
Dance – TNG	\$ 136,520	100	\$ 1,365
Children’s Aid	\$ 161,549	100	\$ 1,615
Hills Project	\$ 398,184	230	\$ 1,731
Suzuki-Orff	\$ 398,184	300	\$ 1,327
Community Lesson	\$ 51,195	63	\$ 813
Experimental Gallery	\$ 122,868	700	\$ 176
Working Classroom	\$ 199,092	85	\$ 2,342
Yakima Academy	\$ 22,753	350	\$ 65
Youth in Focus	\$ 34,130	30	\$ 1,138
CityKids	\$ 205,918	50	\$ 4,118
Summer Arts	\$ 9,670	50	\$ 193
Youth Arts Public*	\$ 94,525	12	\$ 7,877
Art at Work*	\$ 127,578	15	\$ 8,505
Urban SmARTS*	\$ 254,238	480	\$ 530

Totals	\$ 5,850,735	11,744	\$ 498	weighted average
			\$ 1,641	unweighted average
			\$ 1,138	median cost

- YouthARTS Development Project, all others from McArthur 1996, p.15 – 17.

**Appendix B**  
**Benefits of Scale**



This chart simply places the data points in Appendix A: Total number of students in program against cost per student. It indicates an exponential decline in cost as program size increases. Since the analysis framework contemplates serving approximately 120,000 students per grade for nine grade levels, using the weighted average derived from 11,744 students (\$498/student) should conservatively estimate the cost of arts education.

**Appendix C**  
**Crime Benefit Baseline Assumptions**

<b>Program Effectiveness</b>	
Pilot Crime Prevention Rate	50.00%
Scale-up Penalty	40.00%
Juvenile Crime Decay Penalty	0.00%
Adult Crime Decay Penalty	10.00%

<b>Effective Crime Prevention Rates</b>	
Juvenile	30.00%
Adult	27.00%

<b>Targeting Ratio</b>	2.00
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<b>California Offender Rates</b>	<b>General Population</b>	<b>YouthARTS Rates</b>
Non-offender	77.96%	55.92%
Offender	22.04%	44.08%

<b>Adult Criminal Careers Prevented</b>	11.90%
<b>Average Cost Per Offender</b>	\$ 57,698.00
<b>Cost Savings at Start of Adult Career</b>	\$ 6,866.99

<b>Serious Crimes During Career of Average Juvenile</b>	0.61
<b>Serious Crimes of Average Juvenile in Group</b>	1.22
<b>Serious Juvenile Crimes Prevented – age 14-17</b>	0.37
<b>Serious Juvenile Crimes Prevented per Year</b>	0.0915
<b>Cost per Juvenile Crime</b>	\$ 2,377.00
<b>Cost Savings on Juvenile Crime per Year</b>	\$ 217.50

The Targeting Ratio is a multiplier effecting the percentage of offenders in the program's specified cohort. By doubling the percentage of criminals in the cohort, twice as many crimes (or criminal careers) are prevented, and the program is twice as cost-effectiveness.

Adult crime data, juvenile crime rate, and framework for calculation from Greenwood 1996. Cost of juvenile crime from Karoly 1998.

**Appendix D**  
**Calculation of Tax Benefit**

<b>Additional Benefit from Graduating High School to 30 Year-old</b>			Federal Tax	State Tax	Welfare	
Men	White	Native	\$ 628.00	\$ 286.00	\$ 25.00	
		Immigrant	\$ 577.00	\$ 263.00	\$ 41.00	
	Black	Native	\$ 439.00	\$ 238.00	\$ 50.00	
		Immigrant	\$ 404.00	\$ 219.00	\$ 80.00	
	Asian	Native	\$ 605.00	\$ 270.00	\$ 131.00	
		Immigrant	\$ 556.00	\$ 248.00	\$ 189.00	
	Mexican	Native	\$ 437.00	\$ 228.00	\$ 31.00	
		Immigrant	\$ 401.00	\$ 210.00	\$ 52.00	
	Other Hispanic	Native	\$ 445.00	\$ 243.00	\$ 35.00	
		Immigrant	\$ 409.00	\$ 224.00	\$ 56.00	
	Women	White	Native	\$ 724.00	\$ 319.00	\$ 368.00
			Immigrant	\$ 703.00	\$ 299.00	\$ 378.00
Black		Native	\$ 455.00	\$ 259.00	\$ 705.00	
		Immigrant	\$ 442.00	\$ 242.00	\$ 774.00	
Asian		Native	\$ 516.00	\$ 259.00	\$ 764.00	
		Immigrant	\$ 501.00	\$ 243.00	\$ 790.00	
Mexican		Native	\$ 499.00	\$ 272.00	\$ 545.00	
		Immigrant	\$ 484.00	\$ 254.00	\$ 562.00	
Other Hispanic		Native	\$ 724.00	\$ 319.00	\$ 832.00	
		Immigrant	\$ 703.00	\$ 299.00	\$ 877.00	
Unweighted Average 1991			\$ 532.60	\$ 259.70	\$ 364.25	
2001			\$ 698.00	\$ 340.00	\$ 477.00	
California share (12% of Fed benefits)			\$ 84.00	\$	\$ 57.00	

**Annual Benefit to California for each High School Dropout who Graduates \$ 481.00**

Cohort Population, Lowest Quartile SES	120,000
Reduction in Dropout rate for High Involvement vs. Low Involvement	3%
Reduction in Dropouts due to Arts	3,600
Annual Tax & Welfare Benefit to California	\$ 1,731,600
Annual Tax & Welfare Benefit to California per participant	\$ 14.43

**Appendix E**  
**Cost-Benefit Calculation**

Cohort Year	Age of Person	Discount Factor	Cost 2001\$	Crime Benefit	Tax Benefit	NPV Cost	NPV Benefit
0	9	1	\$ (498.00)			\$ (498.00)	\$ -
1	10	0.961538462	\$ (498.00)			\$ (478.85)	\$ -
2	11	0.924556213	\$ (498.00)			\$ (460.43)	\$ -
3	12	0.888996359	\$ (498.00)			\$ (442.72)	\$ -
4	13	0.854804191	\$ (498.00)			\$ (425.69)	\$ -
5	14	0.821927107	\$ (498.00)	\$ 217.50		\$ (409.32)	\$ 178.77
6	15	0.790314526	\$ (498.00)	\$ 217.50		\$ (393.58)	\$ 171.89
7	16	0.759917813	\$ (498.00)	\$ 217.50		\$ (378.44)	\$ 165.28
8	17	0.730690205	\$ (498.00)	\$ 217.50		\$ (363.88)	\$ 158.92
9	18	0.702586736		\$ 6,866.99		\$ -	\$ 4,824.65
10	19	0.675564169				\$ -	\$ -
11	20	0.649580932				\$ -	\$ -
12	21	0.62459705				\$ -	\$ -
13	22	0.600574086				\$ -	\$ -
14	23	0.577475083				\$ -	\$ -
15	24	0.555264503				\$ -	\$ -
16	25	0.533908176			\$ 14.43	\$ -	\$ 7.70
17	26	0.513373246			\$ 14.43	\$ -	\$ 7.41
18	27	0.493628121			\$ 14.43	\$ -	\$ 7.12
19	28	0.474642424			\$ 14.43	\$ -	\$ 6.85
20	29	0.456386946			\$ 14.43	\$ -	\$ 6.59
21	30	0.438833602			\$ 14.43	\$ -	\$ 6.33
22	31	0.421955387			\$ 14.43	\$ -	\$ 6.09
23	32	0.405726333			\$ 14.43	\$ -	\$ 5.85
24	33	0.390121474			\$ 14.43	\$ -	\$ 5.63
25	34	0.375116802			\$ 14.43	\$ -	\$ 5.41
26	35	0.360689233			\$ 14.43	\$ -	\$ 5.20
27	36	0.34681657			\$ 14.43	\$ -	\$ 5.00
28	37	0.333477471			\$ 14.43	\$ -	\$ 4.81
29	38	0.320651415			\$ 14.43	\$ -	\$ 4.63
30	39	0.308318668			\$ 14.43	\$ -	\$ 4.45
31	40	0.296460258			\$ 14.43	\$ -	\$ 4.28
32	41	0.28505794			\$ 14.43	\$ -	\$ 4.11
33	42	0.274094173			\$ 14.43	\$ -	\$ 3.96
34	43	0.26355209			\$ 14.43	\$ -	\$ 3.80
35	44	0.253415471			\$ 14.43	\$ -	\$ 3.66
36	45	0.243668722			\$ 14.43	\$ -	\$ 3.52
37	46	0.234296848			\$ 14.43	\$ -	\$ 3.38
38	47	0.225285431			\$ 14.43	\$ -	\$ 3.25
39	48	0.216620606			\$ 14.43	\$ -	\$ 3.13
40	49	0.208289045			\$ 14.43	\$ -	\$ 3.01
41	50	0.200277928			\$ 14.43	\$ -	\$ 2.89
42	51	0.19257493			\$ 14.43	\$ -	\$ 2.78



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