A benefit-cost analysis of a long-term intervention on social and emotional learning in compulsory school

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There is growing evidence that social and emotional skills can be taught to students in school and teaching these skills can have a positive effect on later outcomes, such as better mental health and less drug use. This paper presents a benefit-cost analysis of a longitudinal social and emotional learning intervention in Sweden, using data for 663 students participating in the evaluation. Intervention costs are compared against treatment impact on self-reported drug use. Pre-test and post-test data are available. Since follow-up data for the participants´ drug use as adults is not available, informed projections have been made. Net present monetary values are calculated for the general public and society. The results show that students in the treatment group report decreasing use of drugs over the five year long intervention, the value of which easily outweighs the intervention costs.

Keywords: social and emotional learning; benefit-cost analysis; school intervention; drug use; school programs

Introduction

Education and youth development researchers have increasingly focused on social and emotional competencies due to evidence that these competencies have importance for students´ success in school and life (Durlak et al., 2011; Heckman & Kautz, 2012; Sklad et al., 2012). These competencies include self-regulation of emotions, self-awareness, emotional stability, relationship skills and responsible decision

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ISSN 2073-7629

© 2017 CRES   Volume 9, Number 1, April 2017   pp   3

making. There is evidence that they serve as protective factors that support and predict success in academics and on the labor market, as well as general well-being by helping students to achieve and develop to their full potential (Heckman & Kautz, 2012). Further, if students develop their social and emotional competencies, they have a lower risk of developing conduct problems and of being involved in risky activities such as violence and drug abuse (Cohen, Piquero & Jennings, 2010; Payton et al., 2008; Sklad et al., 2012).

The use of different educational interventions (or programs: hereafter intervention and program are used interchangeably) in school for enhancing students´ social and emotional learning (hereafter SEL or SE competencies) has since the beginning of the 1990s been common in the USA. Evaluations of these interventions have shown substantial evidence for short-term positive effects for social and emotional learning for both targeted and universal interventions (see Durlak, et al., 2011) as well as long-term effects of targeted interventions (Belfield, et al., 2006; Heckman, et al., 2009; Reynolds et al., 2011; Schweinhart & Weikart, 1980; Schweinhart, Barnes, & Weikart, 1993). These types of SEL interventions have spread to other countries during the last decades and have become more common in Europe today.

In this paper, a benefit-cost analysis (BCA) is presented for a Swedish social and emotional learning intervention. Influenced by SEL interventions in USA and the demonstrated benefits for students´ development, for schools and society at large, Kimber (2001a,b) launched a Swedish longitudinal SEL intervention called Social and Emotional Training (SET), in which two schools in one municipality in Sweden during the years 2000 to 2005 participated. In particular, the effects of the SET intervention on students' drug use are focused in the current BCA study. An overview of the research within the SEL field is presented followed by a review of the research and economics of the effects of SEL on drug use among adolescents and adults. A BCA framework to estimate the value of SE competencies is then outlined, concluding with a BCA for the Swedish SET intervention.

Previous research
Evidence of the importance of students´ social and emotional competencies for later outcomes
In order for individuals to succeed in life, to graduate and to get a good job, it is important that they develop their social and emotional competencies (Heckman & Kautz, 2012; Heckman, Pinto & Savelyev, 2013; Jones, Greenberg & Crowley, 2015). Another term for SE competencies is 'life skills' which has been defined by the World Health Organization (WHO) (1997) as competencies focusing on how to solve and manage daily life challenges and personal development. The definitions of SE competencies are also closely related to the definition of emotional intelligence (Goleman, 1995). If students develop their SE competencies they may gain benefits such as higher educational attainment, higher earnings, better mental health, lower crime rates and less use of illegal substances (Durlak & Weissberg, 2005; Heckman et al., 2013; Levin, 2012).

The impact of SEL interventions in educational settings is usually substantial with effect sizes (Cohen´s d) between 0.2 and 0.6 (Durlak et al., 2011). Sklad et al. (2012) conducted a meta-analytic review of the effects of universal school-based SEL interventions on different outcomes. The interventions showed large effect sizes for social skills. On average, the results showed 7 standard deviations higher for students in treatment groups which corresponded to 76% better social skills compared to the regular students. The authors concluded that SEL interventions seem to be effective across countries and cultures and suggest that

children's social and emotional development may be substantially enhanced by these interventions. In a meta-analysis of 213 school-based, universal social and emotional learning interventions, Durlak and colleagues (2011) found that SEL interventions significantly benefitted student´ outcomes on six categories: SEL skills, attitudes, positive social behavior, conduct problems, emotional distress and academic performance.

Analyses of long-term effects of SEL interventions have been made by a number of studies, such as of the HighScope Perry Preschool Program in the USA (Schweinhart et al., 1993). The program aimed at supporting students´ cognitive and social and emotional development and learning, in which regular teachers adopted teaching strategies whereby students were encouraged to participate actively in planning and doing the curriculum activities as well as reflect upon them. Effect sizes of the difference between the treatment and control group has been shown to range from (Cohen´s d) -.57 for females who are jobless for more than one year to .91 for female test results on the California Achievement Test (CAT). Economic analyses have resulted in estimates of the rate of return (IRR) for the Perry Preschool Program ranging from 6% to17% per year (Belfield et al., 2006; Heckman et al., 2009; Rolnick & Grunewald, 2003).

The impact of social and emotional learning on drug abuse

In a meta-analysis, Tobler et al. (2000) included 207 studies of school-based drug prevention programs for non-targeted student populations. The analysis included studies that were conducted between 1978 and 1998, with pre- and post-tests, delivered in Grades 6 through 12, and with a random assignment design. The dependent variable was self-reported paper-and-pencil tests and the authors found that the variable 'use in the last 30 days' was a good marker for changed behaviors over all programs. In all, programs that had a focus on developing students´ interpersonal and affective competencies as well as their knowledge on drugs and who had an interactive delivery method, were the most effective.

Cohen (1998) estimated the incidence costs of several at-risk behaviors for high-risk youths (criminal behavior and drug abuse) to range from US$ 1.7 to 2.3 million. In a later study, Cohen and Piquero (2009) made more sophisticated calculations of the cost components for drug abuse including resources devoted to the drug market, drug treatment for abusers, reduced productivity, medical costs, premature death, criminal justice costs related to drug-defined crimes and other crimes related to drugs. The costs of drug abuse were estimated to be US$ 2.6 to 4.4 million over the lifetime. Thus, it is suggested that less substance use is a spin-off and indirect effect of developing students´ social and emotional competencies such as improved self-esteem and self-control, better social competencies, strong self-awareness thus an overall 'feeling good' status (Cuijpers, 2002; Wentzel et al., 2009). Nilsson and Wadeskog (2008) have presented several reports and studies which focus on the benefits of early universal interventions delivered to children and adolescents for adult outcomes such as drug abuse, mental health and crime reduction.

The costs for drug use in Sweden

In Sweden, the term drug is primarily related to different kind of narcotics, and is very seldom used for defining alcohol or smoking behaviour. The definition of manifest drug use is related to frequency of using drugs. Using drugs on a monthly basis is commonly regarded as a manifest drug use while using drugs a few times a year or few times during a life-time is a temporary drug use. About 6% of young people (age 16 to 24

years) in Sweden state that they have used drugs on a monthly prevalence which is a considerable lower proportion compared to many countries in Europe (Nilsson & Wadeskog, 2008).

About 10-15% of children may be at risk, risk factors including having low educated and young single parents, parents with alcohol- and drug abuse, parents with mental ill health, low degree of social network, or being immigrants and/or minorities) (Nilsson & Wadeskog, 2008). The costs for an individual can be divided into costs within the family and costs for society. The costs presented in parentheses are in 2013 US$. The costs for society for one 'business as usual' individual between 0-18 years old are about 100,000 SEK ($15,400) per year or 1.8 million SEK between years 0-18 ($277,000). The cost for society for a 16-year old drug user (not manifest) is about 40,000 SEK ($6,200) more per year compared to the 'business as usual' adolescent. The individual total cost for an adolescent drug user between 16-19 years is about 670,000 SEK ($103,000) per year in 2008 money value (Nilsson & Wadeskog, 2008). For older adolescents, between the ages 20-22 the costs are about 135,000 SEK ($20,800) above the 'business as usual' adolescent. In all, the costs are 2,7 million SEK ($415,000) per individual for this age group (16-19 years).

In yearly surveys of the youth population in Sweden, the results show that among men aged 15-16, 2% are drug users (illicit drug use during the past 30 days), with a respective rate of 1% for women. The proportion rises with age; for 17-18 years-olds, the numbers are 6% for men (about 3000 men) and 2% for women (about 1000 women). The surveys also reveal that about 58% of young men who said that they had used drugs in the last 30 days were also large-scale consumers of alcohol (Hensing, 2012; Swedish National Board of Health and Welfare, 2012).

Over the years several projects have estimated the cost of drug use in Sweden which the Swedish National Institute of Public Health (SNIPH) has compiled (Hensing, 2012). In a report from 2008, Nilsson and Wadeskog have estimated the short-, and long-term costs for drug abuse and conclude that an active heroin user costs society 1,7 million SEK ($262,000) per year (in 2011 the costs are suggested to be 2,1 to 2,3 million SEK ($323,000 and $354,000, respectively)). This includes costs for judiciary, funds, treatment, health care and costs for the next generation (children´s needs in fragile families). After five years, the costs have risen to 7,7 million SEK ($1,2 million) and the cost after 30 years is 29,7 million SEK ($4,6 million) for society. These estimates do not take into account the individual`s losses such as a loss of productive wages due to drug abuse; if included these indirect costs would have increased the costs considerably. Most of the costs for a drug user will cease if the abuse stops. The widely debated Methadone Program in Sweden has a return rate of 17:1, which is an annual return of 1700% (Nilsson & Wadeskog, 2008; SOU, 2011:6). A drug abuser who becomes long-term drug-free without relapse has a return of 50 to 150 times the money invested. However, even short-term drug-free with relapses saves money and contributes to the socio-economic gain (Hensing, 2012; Nilsson & Wadeskog, 2008).

A benefit-cost analysis framework

The basic principle for a benefit-cost analysis (BCA) is to evaluate and compare the costs and benefits in monetary values for a certain treatment or intervention. However, conducting a benefit-cost analysis of a SEL intervention requires special consideration to several aspects. First, if the SEL intervention is delivered within the ordinary school schedule, time may be taken from other classes in order to teach students SEL and less

time is spent on other subject, for example mathematics or preparing for tests. Yet, research has shown that SE competencies seem to benefit students´ cognitive development and achievement (Durlak et al., 2011; Heckman & Kautz, 2012).

The benefits of social-emotional programs may occur immediately or may have a more delayed effect if they are the result of changes in attitudes. Behavioral changes may have an immediate effect during the intervention, post-intervention effects, and post-intervention effects in adult life. For the immediate benefits, the question is how fast the benefit effects occur which is understood as 'the ratchet effect'. For the post-intervention benefits, during adolescent and adulthood, the question is how long they last which is understood as the 'fade-out effect'.

Another aspect is the general spill-over effect an intervention may have on the school: students not receiving instruction in SEL may benefit indirectly from the intervention due to spill-over effects, for example on the school climate. These temporal and spill-over effects should be addressed when calculating the benefits of an intervention (Belfield et al., 2015a,b).

Most of the SEL interventions are designed for kindergarten and compulsory schoolings, hence it takes a long time until data for adult life outcomes such as educational attainment, earnings, health status and drug use can be gathered. This means restricted possibilities for long-term follow-ups with experimental data. Yet, long-term analyses can be made by using informed projections to recent results by other researchers (Bartik, Gormley & Adelstein, 2012; Durlak et al., 2011). Even if these projections have limitations, they enable us to estimate some of the long-term effects of a SEL intervention in compulsory education for outcomes in adult life.

If we have a measurement of a specific SE competence that can be linked to later outcome such as less drug use, it may be possible to get a monetary value of the benefit of the intervention. The literature on the association between SE competencies and drug use indicates that strengthening students´ SE competencies decreases their drug use (Cohen & Piquero, 2009; Tobler et al., 2000). For Sweden, the price for short-term social burden for drug use has been calculated by researchers and the Government (Nilsson & Wadeskog, 2008; SOU 2011:6). These short-term shadow prices have been used to calculate the benefits of the SET intervention in the present study.

Purpose

The main purpose of the present study is to conduct a benefit-cost analysis of a longitudinal universal social and emotional training intervention (SET) implemented in two schools in Sweden. In view of the reviewed literature, the hypothesis is that the SET intervention has an indirect positive effect on students´ drug use (decreased use), through students´ enhanced social and emotional competencies.

Method

Participants

In all, answers from 663 students who participated in the five-year follow-up evaluation (Kimber & Sandell, 2009) were included in the current BCA: 489 students in the treatment group (SET) and 174 students in the control group (No-SET). In the evaluation made by Kimber and Sandell (2009), each student answered the

questionnaire on substance use one, two or three times, due to natural attrition. Thus, there was a range of number of answers from 766 to 785 for SET students and 284 to 287 for No-SET students. The difference in the number of answers was due to missing information.

The instrument on drug use

In the years 2001 to 2005, the yearly self-reported assessment included questions on substance use for the students in Grades 7 to 9 (13-16 years of age). Due to the natural turnover, comparisons on the trajectories on the outcome measure according to the number of years (duration) of SET/No-SET, as well as for Grade level, were made. The question 'How many times have you tried drugs?' (seven-point scale, from 'never' to 'more than 50 times') was used in the present BCA (Kimber & Sandell, 2009).

Evaluations of the SET intervention

The SET intervention had been evaluated using longitudinal quasi-experimental design at several different time-points, and the findings show overall positive effect for the intervention on a number of social and emotional outcomes. Positive impacts were identified after two and five years of the intervention (Kimber & Sandell, 2009; Kimber, Sandell & Bremberg, 2008). Several instruments were used in the evaluations. A self-rating instrument (ITIA-I for Grades 1-3 and ITIA-II for Grades 4-9) measuring students´ self-image and self-esteem (Coopersmith, 1967) with subscales for body image, family relations, psychological well-being, relations with others, and talent/abilities, was used. *The Youth Self-Report* (YSA) (Achenbach & Edelbroch, 1987) to measure mental health symptoms and problems. The *Mastery Instrument* (Pearlin, Liebman, Menaghan & Mullan, 1981) evaluated self-efficacy and hopelessness, while the *Social Skills Rating System* (SSRS) (Gresham & Elliott, 1990) measured contentment in school, bullying, and drug use. Overall, positive impacts on these measures were found (for more detailed information see Kimber et al., 2008; Kimber & Sandell, 2009).

Methods of Analysis

In this study, a comparison is made between the intervention and the control group for the SET intervention. The benefits are compared to the costs of the intervention to derive the net present value of the intervention, with all money values expressed in 2013 $US (Riksbanken, 2015). The short- and long-term costs of drug use are taken from official information sources and from research reports. Sensitivity analysis was conducted in order to test whether or not the results are robust for the assumptions made in the calculations. To calculate the costs and benefits of the SET intervention, the impacts from the five-year follow up (Kimber & Sandell, 2009) were used. The ingredients method (Levin & McEwan, 2001) has been applied, where each component of the intervention has been investigated in as much detail as possible (Appendix I). All the ingredients are calculated in US$ 2013 (Riksbanken, 2015). The information on the implementation of the intervention has primarily been given by Kimber et al. (2008), while information on the salaries for the different employees has been gathered from Statistics Sweden (Statistics Sweden, 2013). Information on costs for rent of the facilities (school buildings) has been gathered from the economic department at the educational department in the municipality Botkyrka in Sweden. The costs for the paper used in the manual and the students´ workbooks

have been gathered by using webpages for different office supply companies, calculating a mean cost per paper. Overall, the highest costs are the salaries for the teachers, while costs for facilities and material are relatively low.

Results

First, the costs of the SET intervention were calculated using the ingredients method (Levin & McEvan, 2001). Then, the effects from the five-year follow-up study (Kimber & Sandell, 2009) were used to calculate a benefit-cost ratio of the SET intervention.

Intervention costs

No prior information on the costs of the SET intervention is available. Information on the components of the SET intervention was collected by interviewing the personnel who implemented the intervention and from information materials on the intervention (Kimber, 2001a, b). For an overview of the costs over the five years, see Appendix II.

This BCA has estimated the total costs for the entire intervention over the five years. The cost of the intervention is calculated from 1,028 students who participated at the beginning of the intervention. The costs are in 2013 Swedish prices and a discount rate of 3.5% is used. Both the operating costs such as teacher salaries, and administrative and capital costs such as rent costs for classrooms, facilities and materials, have been estimated.

Personnel categories include teachers, principals, assistant principals, counsellors and intervention developers. Teacher input was estimated on the basis of curriculum delivery, initial (two full days) training and ongoing training. Hours of teacher training were collected from the intervention developer who implemented the intervention. Teachers in Grades 1-5 delivered two 45 minutes sessions of SET instruction (the intervention) every week to the students, each year of the intervention, for a total of 80 sessions per year and 400 sessions over the five years of the intervention. In Grades 6-9, teachers delivered 45 minute sessions of SET instruction every week to the students, each year of the intervention, for a total of 40 sessions per year and 200 sessions over five years. Teachers received 33.5 hours of initial and ongoing training in the first year. In the second year some teachers received additional training, and due to teacher turnover, new teachers received separate training. Training was provided by the intervention counsellor. Data on the national average salaries for teachers in compulsory schools, special education teachers, counsellors, assistant principals and principals has been compiled from Statistics Sweden and used in the cost analysis (Statistics Sweden, 2013).

Facilities for the intervention included school space such as classrooms and training space. The two-day initial training for the teachers was held in an auditorium at one of the schools, while the ongoing training was also held in the facilities at the schools. No travel costs were incurred for training since the schools were located close to each other. The costs for facilities are based on the yearly rent in 2013 Swedish prices that the two schools paid to the municipality.

The materials used in the intervention included a detailed manual used by the teachers for each Grade, which was copied at the schools. Students created their own workbooks by using worksheets. The price for the paper was collected from several companies selling paper, and an average was calculated.

Table I presents the total costs of the intervention. For the five-year intervention, the present value total cost is $555,260 and the average cost per student is $540. However, if we exclude the cost for teacher instruction time, the total cost is $143,000 and the average cost per student falls to $140. This cost estimate is tested for sensitivity to the cohort size. Specifically, as the intervention was delivered to a cohort of 1,028 students, then the costs may be apportioned across this number of youth. If the cohort size falls to 489 (the number of students who answered the questionnaire on drug abuse and who had received the SET treatment), the average cost per student rises to $1136 including teacher instruction time and $292 without teacher instruction time.

The intervention was designed to fit into the standard school curriculum, using equivalent classroom space and replacing regular instruction time. The instruction time and space is therefore not incremental and the only difference between the SET intervention and 'business-as-usual' was how students were taught.

Table I. Costs for SET intervention (5 year period)

Ingredient	Total Cost
Participants	*1,028*
Personnel:	
Teachers (Training/ongoing coaching)	$89,000
Teachers (SET instruction)	$412,260
Administration (Training/support/meetings)	$16,110
Facilities:	
Auditorium	$340
Workshop space	$570
Classrooms	$30,350
Materials/equipment:	
SET Manual	$310
Supplemental materials	$6,320
Total Resource Cost 1 (with teacher SET instruction)	$555,260
Total Resource Cost 2 (without teacher SET instruction)	$143,000
Average Cost 1 per student (=TRC2/1,028)	$540
Average Cost 2 per student (=TRC1/1,028)	$140

Note. Discounted by 3.5% to year 1. Prices in U.S. dollars (2013).
Amounts rounded to $10.

Intervention benefits

To calculate the benefits of the SET intervention on drug use, the Kimber and Sandell (2009) study was used. On the use of drugs, students were assessed at five time points (2001 to 2005). In 2001, students in Grade 7-9 had received one year of intervention, while in 2002, they had received two years of intervention. As the younger students moved up to the next Grade level in the school system, some students had received more years intervention, compared to the older ones. The students were divided into zero/light users and heavier users. The zero/light treatment group reported a decrease in drug use of 5 percentage points (6% to 1%) from year 1 to 5; zero/light students in the control school reported an increase of 6 percentage points (2% to 8%) over the same period. This difference equates to an effect size gain of Cohen´s d = .64. In the heavier users group, there was an increase from 1% to 5% in the intervention group and 1% to 15% in the control group (an effect size, Cohen´s d = .32).

The map for SET benefits shows many additional possible benefits deriving from the intervention (Appendix I). However, these benefits are not included in this analysis. Some factors, such as alcohol, smoking and volatile substances abuse, are likely to be directly confounded with the selected measure of drug abuse. Inclusion of these would therefore lead to double-counting. Other impacts, such as delinquency and behaviour measures of mental health, might also be indirectly confounded with drug use even if these impacts could be accurately shadow priced. Finally, none of the array of social competencies that SET promotes have shadow prices available and therefore cannot be monetized. However, these social and emotional outcomes that are left out of this BCA, may have considerable benefits, thus affecting the benefit-cost ratio of the SET intervention in a positive way.

Shadow prices for drug use are derived from the cost-of-illness or defensive expenditures method. The shadow prices of drug use are based on what society currently spends on these behaviours through the health care, criminal and judicial systems. The calculation by Nilsson and Wadeskog (2008) and the Governmental public enquiry from 2011 (SOU 2011:6) are used in the analysis; other spending estimates are given by Nilsson and Wadeskog (2008) and The Swedish National Board of Health and Welfare (2012). These estimates are conservative in that they do not include costs such as individual loss of income. They are based on defensive expenditures to alleviate delinquency, when the appropriate basis is the expenditure to eliminate delinquency; also these prices do not include the educational burden of school delinquency (on the teacher or the student). It is reasonable to believe that the true burden of delinquency is higher than these shadow prices.

Across Sweden, the estimated annual burden of all types of drug use, including both direct and indirect costs, was $3,9 billion (26 miljarder SEK) in 2008, amounting to $450 per capita nationally (SOU 2011:6; Statistics Sweden, 2009). Of this aggregate amount, 42% was indirect losses of production due to sick leave and premature death, 27% was for spending on the criminal justice system, 26% for health and social care treatments, and the remaining 5% for insurance and private health care. The present value social burden per drug user is estimated at $102,920 in 2013 dollars. Given the respective proportion of youth who are drug users in the intervention (0.003% of 1028 students will be 3 students) (Table II) versus comparison group, there is a net reduction of 0.0982 drug users. This translates into an intervention benefit of $7,510.

The benefit-cost ratio for the SET intervention is presented in Table III. The baseline estimates per participant are at $540 for costs and $7,510 for benefits. This yields a benefit-cost ratio of 14:1 and a net present value of $6,970. The intervention is thus relatively inexpensive per participant, it is highly effective on the population of substance users, and the economic burden per substance user is very large.

Table II. The probability (% and N) of different adult outcomes for the 1028 students in the SET intervention.

Defined status	Baseline Probability across youth (%)	Change in Probability after SET (%)	N students affected in SET program (N)
Drug abuse	0.003	0.003	3.1
Alcoholic abuse	0.01	0.01	10.3
Mental illness, severe	0.005	0.005	5.1
Mental illness, light	0.05	0.05	51.4
Long-term sickness	0.03	0.03	30.8
Long-term unemployment	0.03	0.03	30.8
Sum			131.5
Per cent (%)			12.8%

Table III. Intervention Benefit-Cost results per participant. S1 to S3 show the results from sensitivity tests.

	Costs	Benefits	Benefit-Cost Ratio	Net Present Value
Baseline	$540	$7,510	13.9	$6,970
Sensitivity tests:				
S1. Smaller cohort of students	$1136	$7,510	6.6	$6,374
S2. Heavy users only	$540	$3,760	7.0	$3,220
S3. 60% fade-out in year 1	$540	$3,000	5.6	$2,460

Source. Table I above. *Notes:* Present values (d=3.5%) in 2013 dollars.

As shown in the bottom panel of Table III, the intervention is unlikely to have a benefit-cost ratio that is less than one. In the sensitivity analysis, the calculations are made both with and without instructional time, calculating a smaller cohort, only calculating heavy users and a fade-out effect of 60%. Under the assumption that the cohort is smaller than expected (489 participants who received the intervention and answered the questionnaire on drug abuse), and therefore program costs are higher, the benefit-cost ratio is 7:1. Counting only the benefits from heavy users, the benefits are only reduced slightly and the benefit-cost ratio is 7:1. Finally, even if the fade-out rate is 60% within the first year, the benefits still exceed the costs with 6:1.

Moreover, the net present value is likely to be even greater than reported here, given that only the public burden of drug abuse is included (and not the private burden).

Discussion and conclusions

The purpose of the study was to conduct a benefit-cost analysis of a Swedish SEL intervention. The costs were gathered using the ingredients method (Levin & McEvan, 2001) and the benefits from an evaluation made by Kimber and Sandell (2009). The overall results show that the SET intervention is an inexpensive intervention and the benefits outweigh the costs. The intervention is low in price partly due to being a replacement whereby ordinary teachers teach their students in the regular classrooms. Of course, it could be argued that the SET intervention may have sacrificed other instruction that is believed to increase learning. However, according to a large amount of research studies, students who develop their social and emotional competencies have greater possibilities to be successful in school and life (Durlak et al., 2011; Harlen & Deakin Crick, 2002; Sklad et al., 2012). Analyzing the benefits of the SET intervention, the effects are strong even if the shadow prices are somewhat old and imprecise for 'cost-of-illness' drug use. The prices may have gone up, so that the cost-of-illness may higher today. The result of the BCA is in line with previous research on the importance of developing students´ social and emotional competencies as an opportunity to succeed in life (Bartik et al., 2012; Belfield et al., 2015; Durlak et al., 2011; Heckman & Kautz, 2012; Heckman et al., 2013; Jones, Greenberg & Crowley, 2015; Levin, 2012). The conclusion made here supports previous research that early intervention focusing social and emotional learning and development is of major importance in reducing drug use among adolescents and hence reduces the cost for society (Cohen & Piquero, 2009; Tobler et al., 2000). The results of the present study show that a universal intervention, aiming at increasing students' overall social and emotional competencies such as self-awareness, empathy and self-regulation, is successful in reducing students' drug use. As in the Tobler et al. (2000) meta-analysis, interventions that had a focus on developing students´ intra- and interpersonal and affective competencies such as conflict-resolution, coping with stress and emotional regulation, and that included active student participation and interaction, were the most successful in decreasing drug use. It has been argued by several researchers that less substance use is a spin-off and indirect effect of students' enhanced social and emotional competencies (Cuijpers, 2002; Ellickson, Tucker & Klein, 2003; Wentzel et al., 2009), which is supported by the result of the current BCA.

However, there are a number of challenges in conducting BCA of SEL interventions, both methodologically and empirically. There exists no standardized procedure of cost calculations in any evaluations of SEL interventions. The ingredients method is seldom used in evaluating SEL interventions. As a result of the lack of a standardized procedure to document the resources and the costs for the intervention, researchers who conduct a BCA must retrieve costs from teachers and implementers retrospectively, which may lead to incorrect numbers. In the case of SET intervention, the implementer had documented in detail all the resources which made the cost analysis relatively straightforward to carry out.

Furthermore, evaluations show a large variety of used instruments and measures, which makes it almost impossible to compare the results of SEL interventions. The ratchet and fade-out effects are also hard to be identified and calculated from the current evidence in most evaluation studies (Belfield et al., 2015a,b).

Another major concern is the selection process and whether or not the intervention and evaluations are methodologically sound. There is a great need for studies using a randomized experimental design. The SET intervention targeted students from a low socioeconomic catchment area, and thus the generalizability of the result may be questioned. One concern, for instance, is whether this intervention would give the same returns with more advantaged students. One of the most important factors whether or not an intervention is effective is how the intervention is delivered and the level of fidelity in the implementation (Sklad et al., 2012). Another concern is that this study does not answer the question which of the components in the intervention is making it effective in reducing drug use. However, despite all these methodological and empirical issues, the BCA of the SET intervention shows major benefits and a great monetary value in enhancing students´ social and emotional competencies which in turn can reduce students´ drug use.

In light of problems in the Swedish school system during the last decade, such as decreasing PISA results, increased segregation among students, and schools and a teacher force that is all but satisfied with the working conditions, there is increasing pressure on the need to focus on factors that enhance student learning. For example, over the past years, the proportion of students who drop out of school has increased in Sweden, and in 2015, 14.4% of 15-16 year-olds were not eligible to apply to upper secondary education due to failing grades in compulsory education. This means that about 14 000 students drop out of compulsory school each year and only about 10% of them eventually graduate from upper secondary education (National Agency for Education, 2016). According to Nilsson and Wadeskog (2008) 10-15% are at risk which means that between 50 to 70 students participating in the SET intervention may be at risk. This suggests that for certain subgroups of students (high-risks students) the benefits for the SET intervention may be higher. The intervention may in this light be regarded as yielding advantages for children at risk and decreasing the reciprocal relations of drug use, mental illness, school failure and drop-out of school, both at compulsory and upper secondary education levels. The increased segregation in the Swedish school system may also suggest that we need to compensate students with less favourable backgrounds by giving them the possibility to develop their social and emotional competencies, besides their cognitive skills.

In two previous evaluations of the SET intervention (Kimber et al., 2008; Kimber & Sandell, 2009), the results showed positive impacts on several SE competencies which may lead to economic benefits for society. In the current study only one outcome was analyzed: drug use. In future, it would be of great interest to conduct a BCA on the other outcomes such as self-awareness, empathy and self-regulation.

Limitations

There are several limitations in the current study. First, the selection of schools and classes in the SET intervention were not randomized, and a quasi-randomized-controlled design was used instead. This is a major issue and makes the results somewhat limited in generalization to other populations. However, methods which compensated for empirical flaws were conducted which may be sufficient for the conclusion that the SET intervention has a benefit-cost ration more than 1.

Second, ratchet and fade-out effects cannot be identified or measured from the available data. Third, during the intervention some students left school but sometimes came back to a class where the intervention was being implemented. This suggests a degree of variability in the amount of teaching in social and

emotional learning students may have received, and the data does not identify how much training the students received. It is reasonable to believe that students received less instruction than planned according to the SET curriculum, due to them leaving the SET classes but later coming back. Besides, one of the principals and several of the teachers left the school, which may have affected the delivery of the intervention. Fourth, since the economic calculations are made on the individual level, the economic value of the SET intervention on school and classroom climate is not taken into account. There could be considerable spill-over effects on other students which could have an effect on the school climate. However, the effect of the intervention on school level may be considerable and should in future research be taken into account.

Another limitation is that the five-year evaluation was made by the researchers who implemented the intervention. Even though the evaluation (Kimber & Sandell, 2009) has been peer-reviewed and published in an international journal, the effects in the evaluation may have been different if independent researchers had performed the evaluation. Finally, we use the estimated annual burden for all kinds of drug abuse which yields an estimated burden per drug user. This annual burden estimate includes all costs related to drug use, both light and heavy. However, by conducting sensitivity analyses we moderated the relation between the costs for society (annual burden) with the different benefits of the program for different subgroups, such as light users or heavy users. Since we do not have follow-up data for the intervention students on their drug use later in life, we make informed projections. The true ratchet and fade-out effects cannot be identified or measured from the available data, so before longitudinal data is available, these projections are the best we can achieve.

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Appendix I: Benefits map for the SET intervention

Outcome Categories	Specific Outcomes	Measures	Monetizable
Substance abuse	Drugs	SR- student	Y
	Alcohol	SR- student	P
	Smoking	SR- student	P
	Volatile substances	SR- student	P
Delinquency	Aggressiveness	SR- student	P
Mental health	Psychological well-being	SR- student	P
	Body image	SR- student	
	Bullying	SR- student	P
	Attention seeking	SR- student	
Social competence	Talent/ability	SR- student	
	Relation with others	SR- student	
	Internalizing	SR- student	
	Externalizing	SR- student	
	Mastery	SR- student	
	ITIA	SR- student	
	Social skills	SR- student	

Note. SR: Self-report; P: potentially monetizable.

Appendix II: Total costs for the SET intervention over 5 years

Ingredient	Year 1	Year 2	Year3	Year 4	Year 5	Total Cost
Participants	*1,028*	*1,028*	*1,028*	*1,028*	*1,028*	*1,028*
Personnel:						
Teachers (Training/ongoing coaching)	$57,000	$17,870	$4,710	$4,710	$4,710	$89,000
Teachers (SET instruction)	$82,450	$82,450	$82,450	$82,450	$82,450	$412,260
Administration (Training/support/meetings)	$7,270	$4,480	$1,450	$1,450	$1,450	$16,110
Facilities:						
Auditorium	$340	$0	$0	$0	$0	$340
Workshop space	$170	$100	$100	$100	$100	$570
Classrooms	$6,070	$6,070	$6,070	$6,070	$6,070	$30,350
Materials/equipment:						
SEL Manual	$60	$60	$60	$60	$60	$310
Supplemental materials	$1,260	$1,260	$1,260	$1,260	$1,260	$6,320
Total Resource Cost 1 (with teacher SET instruction)	$154,630	$112,290	$96,110	$96,110	$96,110	$555,260
Total Resource Cost 2 (without teacher SET instruction)	$72,180	$29,840	$13,660	$13,660	$13,660	$143,000
Average Cost 1 (=TRC2/1,028)						$540
Average Cost 2 (=TRC1/1,028)						$140

Note. Discounted by 3.5% to year 1. Prices in U.S. dollars (2013). Amounts rounded to $10