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# **PREVENTION OF ALCOHOL AND DRUG PROBLEMS AMONG ADOLESCENTS: EVALUATING A SWEDISH VERSION OF THE STRENGTHENING FAMILIES PROGRAM**

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*To Tamina and EmmaTora*



## ABSTRACT

Alcohol and other drug use among adolescents is a persistent public health problem. Several methods have been developed and studied with the aim to prevent underage substance use. Strategies involving parents in preventive interventions have been promising, and one program in particular has been high-lighted; the Strengthening Families Program 10–14 (SFP 10-14). A culturally adapted version of the SFP to Swedish conditions was developed. The program was named Steg-för-Steg, and a randomized controlled trial was conducted to evaluate the effects of the program on adolescent alcohol and other drug use. This thesis is built around the planning, implementation and outcomes of this RCT with the aim to explore the role of parental programs in reducing problems with alcohol and other drug use among adolescents.

This thesis is based on four papers. The first paper is a descriptive study of the planning, and development of the Steg-för-Steg program. In addition, a pilot study involving two 6<sup>th</sup> grade classes from two schools in Stockholm is presented. The three additional papers are based on a randomized controlled trial including 707 students and parents in 19 schools in Stockholm. Youth participation in the study required an active consent from their parents, hence the final study population consisted of 587 students, and all parents independent of their child's participation or not. In paper II predictors of parental participation and retention in the Steg-för-Steg program is examined with multiple logistic regression analyses. The data is based on 441 parents of 6<sup>th</sup> graders from the intervention arm in the RCT. Paper III analyzes the effects of the Steg-för-Steg program on adolescent use of alcohol and other drugs. General Linear Model is used to examine being drunk lifetime, and norm-breaking behaviours in 587 students during four time points. In paper IV the effects of the Steg-för-Steg program on predictors of adolescent use of alcohol and other drugs is studied with univariate and multiple logistic regression analyses. Data is obtained from 587 students and their parents. Predictor variables were obtained in grade 7, and outcome variables in grade 9. The results from paper I show that it is possible to transport a family-based program from one country to another, especially if care is taken to adapt the program to local conditions without losing program fidelity. Paper II shows that parents with a lower level of emotional warmth participated to a greater extent in the Steg-för-Steg program than those with higher level of warmth. In addition, a restrictive attitude towards youth and alcohol was related to participation. Retention in the program was associated with being born in Sweden, and having a low score on the warmth scale. In paper III results from the RCT shows that no effects of the Swedish version of the Strengthening Families Program were found on adolescent use of alcohol, tobacco, and illicit drugs. Finally, paper IV reveals that high parental knowledge, parents with a restrictive attitude towards youth and alcohol, and adolescents reporting a positive school climate were associated with a lower risk of alcohol and other drug use. Furthermore, youth with high norm-breaking behaviours, youth attending a school in an area with high socioeconomic status, and youth with parents born in Sweden were more likely to have used alcohol and other drugs. There was no association or impact from parental participation in the Swedish version of the Strengthening Families Program on risk or protective factors for adolescent substance use.

**Conclusion.** While it is possible to transport a family program like the Strengthening Families Program from its American original to Sweden, and also that many parents can be recruited to participate in the program, no effects were found for the program, neither on substance use among the adolescents, nor on the risk and protective factors that the program aims to affect.

## LIST OF PUBLICATIONS

This thesis is based on the following papers, which will be referred to in the text by their Roman numerals.

- I. **Skärstrand E.**, Larsson J., and Andréasson S. (2008). Cultural adaptation of the Strengthening Families Programme to a Swedish setting. *Health Education*, 108(4):287-300.
- II. **Skärstrand E.**, Bränström R., Sundell K., Källmén H., and Andréasson S. (2009). Parental participation and retention in an alcohol preventive family-focused programme. *Health Education*, 109(5):384-395.
- III. **Skärstrand E.**, Sundell K., and Andréasson S. Evaluation of a Swedish version of the Strengthening Families Programme: Three-year outcome of a cluster randomized trial. Submitted manuscript.
- IV **Skärstrand E.**, Sundell K., and Andréasson S. Effects of a family-focused preventive program on predictors of adolescent use of alcohol and other drugs. Manuscript.

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# **1 BACKGROUND**

## **1.1 DEVELOPMENTS IN YOUTH CONSUMPTION OF ALCOHOL, TOBACCO AND OTHER DRUGS**

Alcohol use is ranked as number two of ten leading risk factor causes of DALYs (Disability Adjusted Life Years) in high-income countries, and contributed to the loss of 6.7 % of DALYs in 2004 [1]. Tobacco use is ranked number one (10.7% DALYs), and illicit drug use to number eight (2.1% DALYs). Alcohol accounts for 4.6% of the global burden of disease [2], and is alongside with tobacco one of the leading preventable causes of death and disability. Hence, it has become a major public health concern to identify risks with alcohol, tobacco and illicit drug use, and to promote effective interventions.

In Sweden 71 % of 15 – 16 year old youths reported having consumed alcohol during the last 12 months, and 37 % reported being drunk in the last 12 months. The frequency of binge drinking, i.e. having five or more drinks per occasion, was 37 % during the last 30 days [3]. In comparison with other European countries data from Sweden are at moderate levels, slightly below the average (39 %) for being drunk during the last 12 months. When looking at the same measure but by gender, Swedish girls report somewhat higher levels than the average, see figure 1. This data comes from the European School Survey Project on Alcohol and Other Drugs (ESPAD) [3]. Data are collected ever fourth year on 15-16 year old adolescents in 35 countries.

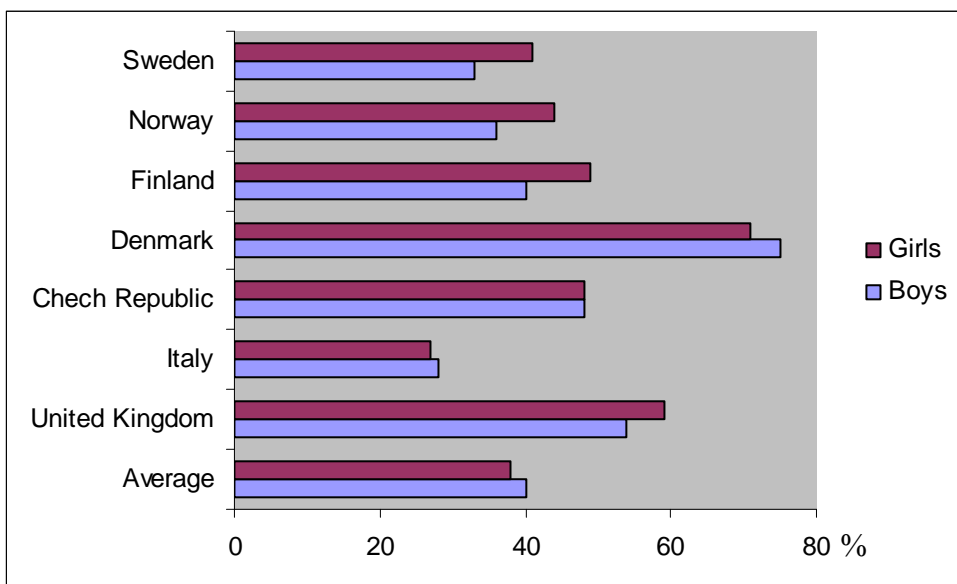


Figure 1. Percentages of being drunk during the last 12 months for 15-16 year olds in seven European countries 2007 [3]

Swedish youth report higher levels than average for alcohol consumption during the latest drinking day, see figure 2.

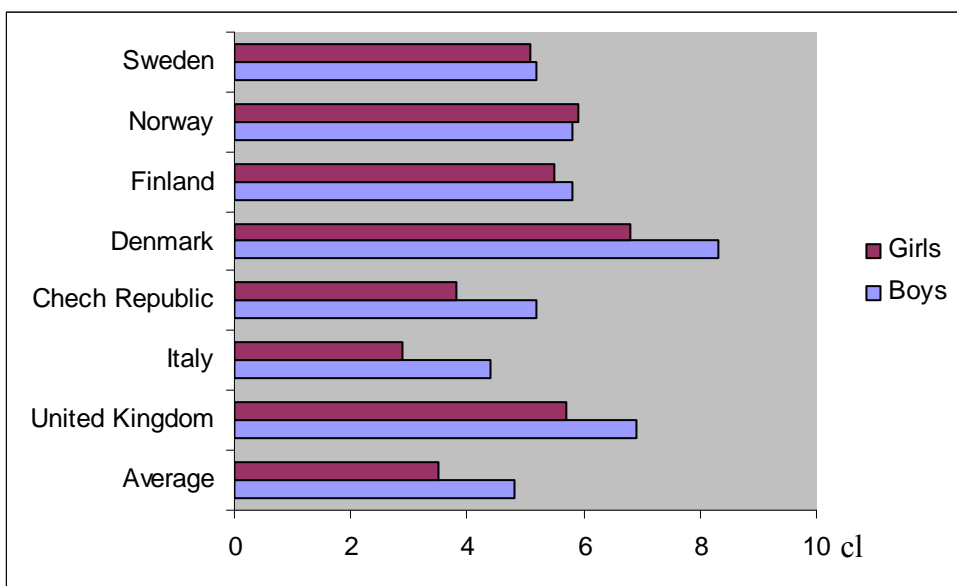


Figure 2. Average alcohol consumption during the last alcohol drinking day, in centilitres of 100% alcohol [3]

Seven per cent of Swedish youth reported lifetime use of marijuana. This is only about one third of the mean in the ESPAD survey, see figure 3.

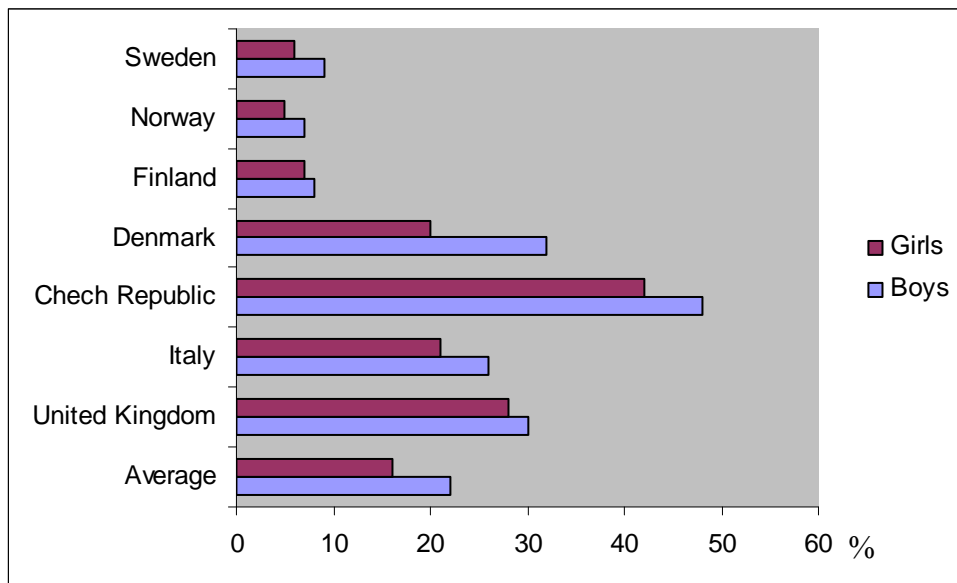


Figure 3. Percentages of lifetime marijuana use for 15-16 year olds in seven European countries 2007 [3]

During the last decade alcohol consumption among Swedish students in grade 9 has decreased, especially for boys [4], see figure 4.

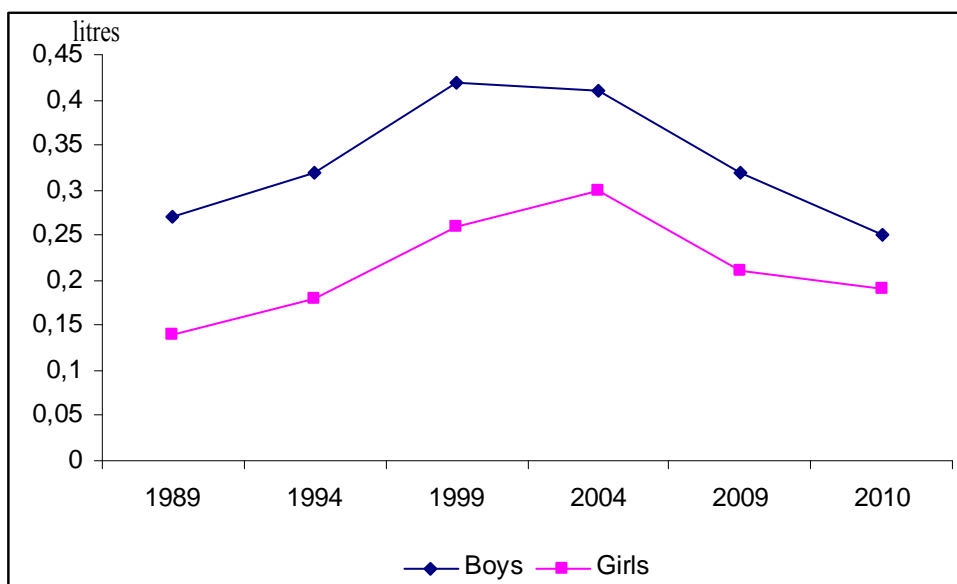


Figure 4. Yearly alcohol consumption in litres of 100 % alcohol for 15-16 year olds in Sweden [4]

A decreasing trend for binge drinking during the past 30 days has also been reported for Swedish boys and girls in grade 9, see figure 5.

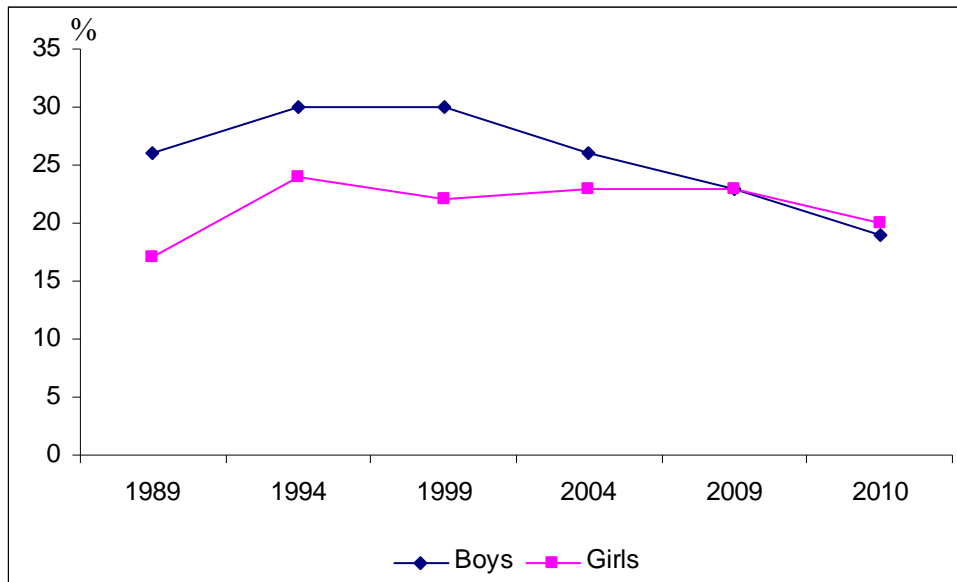


Figure 5. Frequency of binge drinking during the last 30 days. Percentages for boys and girls [4]

Swedish data show relatively moderate levels of alcohol consumption among adolescents compared to other European countries, but nevertheless this is a persistent public health problem and preventive interventions are necessary.

### 1.1.1 Prevention

In prevention different terms are used in different research settings. In medicine the terms used are primary, secondary, and tertiary prevention, where primary prevention refers to efforts to prevent a problem to arise in the first place, secondary prevention involves interventions at an early stage of problem development, and tertiary prevention involves treatment to prevent the harm the condition can lead to [5-6], although some are critical of the term tertiary prevention. In contrast, within social services and social work research the terms are prevention, early intervention, and treatment. Additionally, in behavioural science the corresponding terms in use are universal, selective, and indicated prevention. Universal prevention is targeting the general population with the aim at preventing or delaying the onset of alcohol and other drugs. Selective prevention focus on individuals or subgroups at risk for developing

problems with alcohol and other drugs, while indicated prevention are designed to address those who exhibit early signs of substance use.

For several decades, universal interventions directed at youth have dominated in the prevention field. Preventive efforts against underage drinking have been perceived to be of particular importance. To this end, research reporting large benefits on both the societal and individual level for programs that delay the onset of alcohol use has been important. In a cost benefit analysis of a general family-focused prevention program, the Iowa Strengthening Families Program, a cost-benefit ratio of \$9.60 per each \$1 invested was found [7], indicating that substantial costs to society may be avoided at a relatively low intervention cost.

On the individual level, alcohol use among young people is related to an increased risk of immediate consequences like alcohol related injuries [8-14], risky sexual behaviours [15-16], and suicide attempts [17], and to problems later in life with increased risk of alcohol dependence [15, 18-22]. Also, adolescence is a developmental time period when the brain undergoes major changes, and exposure of alcohol, especially binge drinking, during this time period could have harmful effects on the brain, particularly on memory processes [23-25].

### **1.1.2 Risk and protective factors**

Some of the most prominent prevention strategies for alcohol and other drug problems in adolescents is based on a risk-focused approach. According to Hawkins et al. [26] these risk factors can be divided into two categories: first are broad societal and cultural factors, second are individual and interpersonal factors. Risk factors on a societal level include laws and norms favourable to the use of alcohol, availability, economic deprivation, and neighbourhood disorganization. Individual and interpersonal factors that are associated with a greater risk of adolescent drug abuse include psychological factors like sensation seeking and poor impulse control [27-31], inadequate family management practices [32-35], family conflict, low bonding to family, permissive family environment [32, 36], academic failure, low commitment to school [37-39], association with drug-using peers and early onset of drug use [32, 40-41]. The assumption in a risk focused approach, is that reducing, eliminating, or mitigating its precursors can prevent alcohol and other drug problems. Since some risk factors could be resistant or difficult to change, it has been suggested that risk focused prevention

should be accomplished both through risk reduction and the enhancement of protective factors, which can mediate or moderate the effects of exposure to risk.

Risk factors on a broader societal level have been explored, and resulted in an impressive amount of evidence for universal interventions targeting restrictions in affordability, availability, and accessibility of alcohol [42]. Impact of these broad measures on public health are high. Similarly, interventions targeted at high-risk populations, have been shown to be effective, for example the HighScope Perry Preschool Study [43]. However, the evidence for effects on the community level for school based, and family-focused programs have so far been limited.

### **1.1.3 Family-focused interventions**

Several risk and protective factors for adolescent problem behaviours that have been identified in the literature originate in the family context [44-45]. A large body of research shows that interventions with family involvement can be effective in reducing problem behaviours including substance use [46-50]. The most important concepts in successful family-focused programs include positive parent-child relationships, communication, monitoring and supervision. These programs aim at developing psychological and social skills in youth with the intention that they will be less likely to misuse alcohol and other drugs. In addition, interventions comprising parental practices like setting alcohol-specific rules have been shown to lower the likelihood to initiate drinking in adolescents [51]. In a Cochrane Collaboration Systematic Review, Foxcroft et al. [52] points out the Iowa Strengthening Families Program (ISFP) as one of the few that has demonstrated positive, and in the longer-term enduring outcomes [53-54].

### **1.1.4 Strengthening Families Program, and theoretical framework**

The original Strengthening Families Program (SFP) was developed by Karol Kumpfer in 1983 [55]. The program was designed for substance-abusing parents and their children 6 to 10 years of age. A major revision of the SFP, made by Richard Spoth and Virginia Molgaard at Iowa State University and in collaboration with Karol Kumpfer in 1993, resulted in a universal family program: the Iowa Strengthening Families Program (ISFP) later renamed the Strengthening Families Program: For Parents and Youth 10–14 (SFP 10–14). The program has an interactive skills-building seven-week curriculum plus four optional booster sessions. All parent sessions and two of the youth sessions, as well as two of the family sessions, are video-based. The sessions are held separately

for parents and children for the first hour, followed by a family session the second hour. In every session different risk and protective factors are addressed, see below [56].

### Examples of youth risk and protective factors:

<b>Risk factors</b>	<b>Protective factors</b>
<ul style="list-style-type: none"><li>• Aggressive/withdrawn behaviour</li><li>• Negative peer influence</li><li>• Poor school performance</li><li>• Lack of prosocial goals</li><li>• Poor relationship with parents</li></ul>	<ul style="list-style-type: none"><li>• Positive future orientation</li><li>• Peer pressure resistance skills</li><li>• Prosocial peer relationship</li><li>• Positive management of emotions</li><li>• Empathy with parents</li></ul>

### Examples of risk and protective factors in parents' behaviour:

<b>Risk factors</b>	<b>Protective factors</b>
<ul style="list-style-type: none"><li>• Demanding and rejecting behaviour</li><li>• Poor child management</li><li>• Harsh and inappropriate discipline</li><li>• Poor communication of family rules</li></ul>	<ul style="list-style-type: none"><li>• Positive parent-child affect</li><li>• Supportive family involvement</li><li>• Age-appropriate expectations</li><li>• Appropriate parental monitoring</li><li>• Clear expectations regarding substance use</li></ul>

In the development of the original SFP the focus was on family risk and protective factors. The researchers compared relevant precursors from literature searches to local data on drug-abusing families. These data then guided the theoretical models. The original model was the Values-Stressors-Coping Skills and Resources Model

[57]. When the program was revised to target a general population more focus was turned on protective processes in the family, and theoretical guidance for the ISFP included the Resilience Model [58] and the Social Ecology Model of Adolescent Substance Use [59]. These models included basic resiliency characteristics in youth with associated coping or life skills: optimism, empathy, insight, intellectual competence, self-esteem, direction or purpose of life, and determination-perseverance [60].

### **1.1.5 The Steg-för-Steg program**

A cultural adaptation of the Strengthening Families Program [61] was developed at STAD (Stockholm prevents alcohol and drug problems), a research and development unit within the Stockholm County Council in 2001-2002. The adaptation involved translation of all materials to Swedish, making new videos with Swedish actors, and in a Swedish setting. These steps were done in collaboration with Virginia Molgaard. In the process the Swedish program director for the Steg-för-Steg program, together with the researcher, underwent SFP 10-14 training for trainers in the United States. Two reference groups were formed; one with researchers, and one with teachers to guide the process of program development. A small telephone survey of parents to 12-13 year old students in northern Stockholm was conducted, with the purpose of identifying barriers to parental participation in the program [62]. A pilot study was then conducted with two schools in Stockholm, each with one class of students in grade 6 (age 13) and their parents [62]. The Swedish version differs from the original SFP 10–14 mainly in the program format. The original SFP 10–14 consists of seven plus four optional booster sessions. The Swedish version comprises 12 sessions altogether; we chose to turn the optional booster sessions into a regular part, and also added one extra session. All youth sessions in the Swedish version are held in the school during daytime, while the parent sessions as well as the two family sessions are held in the evenings, also in the school. For comparison of the Swedish version, Steg-för-Steg, and the SFP 10 – 14, see table 1.



Table 1. Comparison of program formats of Steg-för-Steg and the SFP 10-14

	<b>Steg-för-Steg</b>	<b>SFP 10-14</b>
<b>Part one</b>	Part one includes six separate sessions (1 1/2 – 2 hours in length) for youth and parents. The 7 <sup>th</sup> session includes two family hours.	Six sessions including one hour of separate youth and parent training followed by one family hour. The 7 <sup>th</sup> session includes only one family hour.
<b>Part two (Boosters)</b>	Part two consists of four separate sessions for youth and parents. The 5 <sup>th</sup> session includes two family hours. More emphasis on alcohol and other drug-related issues.	Three booster sessions (optional) including separate youth and parent training followed by one family hour. The 4 <sup>th</sup> booster session includes only one family hour.

The Swedish version does not differ significantly from the SFP 10–14 in terms of content. All core components like communication skills, family bonding, peer resistance skills, stress management, handling emotions, communicating rules and consequences in relation to household chores as well as expectancies concerning substance use are intact. Even though some of the family session components are omitted, we tried to make up for this by introducing links between the youth and parent sessions, and by adding extra weight on the content in the two existing family sessions.

The topic for each session in the Steg-för-Steg program is described below in table 2. Equally to the original SFP 10–14, every session deals with one or more risk and protective factors. In the youth sessions this is implemented through learning games and role-playing, and in the parent sessions via videos portraying typical youth and parent situations, and with discussions.

Table 2. Topics for youth, parent and family session in the Steg-för-Steg program

<b>Session</b>	<b>Youth</b>	<b>Parent</b>
Part one		
1	Having goals and dreams	Love and limits
2	Appreciating parents	Making house rules
3	Dealing with stress	Encouraging good behaviour
4	Following rules	Using consequences
5	Dealing with peer pressure	Building bridges
6	Peer pressure and good friends	Protecting against substance use
7	Family session: Putting it all together I	
Part two		
8	Handling conflicts	Handling stress
9	Making good friends	Communicating when you do not agree
10	Young, drunk and inexperienced	Youth, parents and alcohol I
11	Alcohol, tobacco, drugs and the media	Youth, parents and alcohol II
12	Family session: Putting it all together II	

### **1.1.6 Transportability and fidelity**

There are many factors to be considered when transporting preventive interventions between efficacy and effectiveness trials, as well as from one cultural setting to another. Such factors include clients/participants, practitioners who deliver prevention programs, intervention structure, and organizational culture/climate [63].

When programs first are tested in efficacy trials, the conditions are optimal with researchers and program developers working closely together. Therefore, a second stage needs to be taken in effectiveness trials where the intervention is tested in a real-world setting. The effects in efficacy trials are often superior compared to the effects of effectiveness trials. This is one of the key challenges to address in prevention research [64-66].

Another challenge relates to possible loss of fidelity when programs are culturally adapted to meet local needs [67-68]. The concern is that original core components of the intervention may be lost in the transformation, whereby the program no longer is the same as intended. There is a fidelity-adaptation dilemma, with two opposing views; one arguing that cultural adaptation endangers the fidelity of core elements, and the other favours the need for adaptations to fit within diverse context [69-70].

## **2 AIMS OF THE THESIS**

The main aim of this thesis is to explore the role of parental programs in reducing problems with alcohol and other drug use among adolescents within a theoretical framework of risk and protective factors.

Key research questions are:

- Can prevention programs successfully be transported across nations and cultural boundaries? (Paper 1)
- What are the determining factors for parents to participate in a family-focused alcohol prevention program? (Paper 2)
- What are the effects of the Swedish version of the Strengthening Families Program on adolescent's use of alcohol, and other drugs? (Paper 3)
- What is the impact of a family-focused preventive program on predictors of adolescent use of alcohol and other drugs? (Paper 4)

## **3 MATERIALS AND METHODS**

### **3.1 SAMPLES AND PROCEDURE**

#### **3.1.1 Paper I**

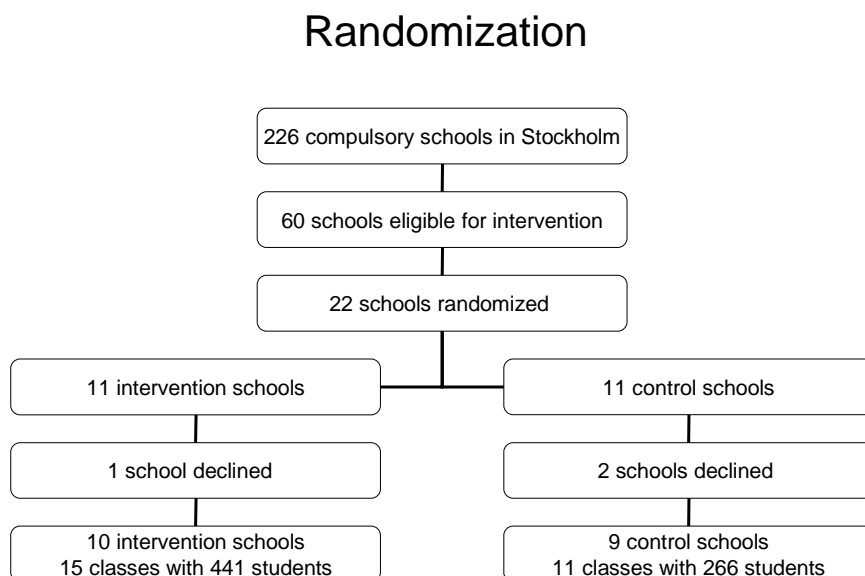
In paper I a descriptive approach was used to assess the cultural adaptation of the Strengthening Families Program 10 – 14 to a Swedish setting, and to describe the program development. A telephone interview with 20 parents was conducted to identify possible interest in and or barriers of participation in a family program. A pilot study with the aim to test the materials, and to examine how the Steg-för-Steg program was received by youth, parents, teachers, and leaders was conducted in two schools in Stockholm. From each school, one 6<sup>th</sup> grade class was chosen to participate with their class teacher. The two class teachers and four recruited leaders were trained in the Steg-för-Steg program by two certified SFP-trainers from the research team. The first part of the Steg-för-Steg program comprised seven sessions, and was held during spring of 2002. The second part with five sessions was conducted in the fall of 2002, when the youth were in the 7<sup>th</sup> grade. A total of 51 students, and 37 parents participated in the first part, and in the second part 54 students and 23 parents participated. Sixty per cent of the participating parents were women. The evaluation of the pilot study included course evaluations from both students and parents, check lists from teachers and leaders as well as a focus group interview with parents.

#### **3.1.2 Papers II, III and IV**

Papers II, III, and IV are based on a cluster randomized controlled trial, including 707 students and their parents in 19 schools in Stockholm. Youth participation in the evaluation required the active consent of their parents. Eighty-three percent of the parents gave their consent, hence the final study population consisted of 587 students and their parents.

### 3.1.2.1 Recruitment and randomization

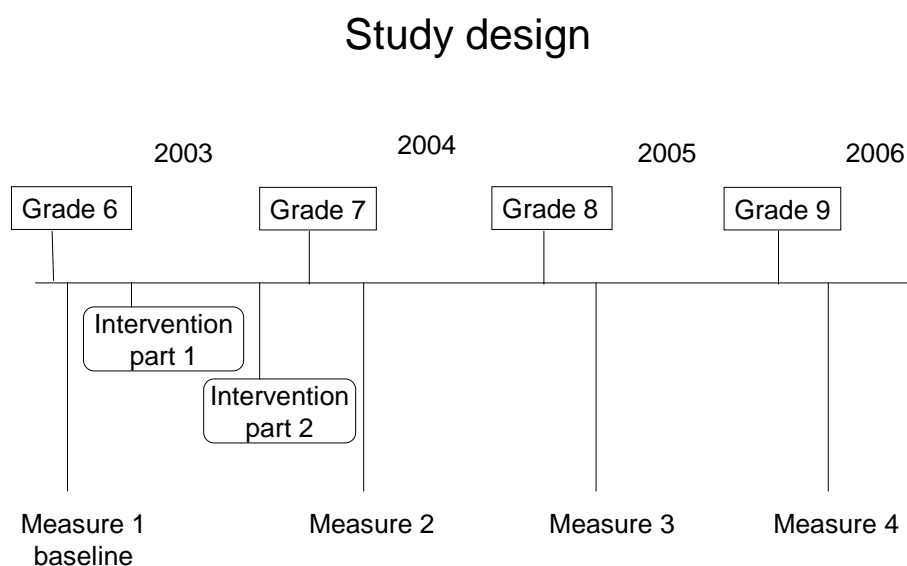
Schools selected in the study were all elementary schools in Stockholm. Inclusion criteria was having grade six to nine in the same school, and not having age-integrated classes. Of all elementary schools in Stockholm (N=226), 60 schools were eligible for participation. Principals of the qualified schools were invited to join the study with one class each. The invitation contained a mailed informative videotape, a brochure, and a letter which explained that participants would randomly be assigned to either an intervention or a control group. Twenty-two schools applied to participate in the study. Schools were stratified into two strata: high and low income areas with 12 schools in the high income and 10 in the low income areas. Each school's name was written on a scrap of paper which was then folded and put in one of two bowls according to income level. One person not involved in the study, drew six schools from the high-income areas, and five from the low-income areas. The eleven schools drawn from the two bowls constituted the intervention, and the remaining 11 formed the control. One intervention school and two control schools later declined participation. The final study population consisted of 10 intervention schools and 9 control schools. Five of the schools wanted to include more than one class per school in the study; hence the distribution on class level comprised 15 classes in the intervention group and 11 classes in the control group, see figure below.



Prior to the study a power calculation was performed, based on earlier research, e.g. Spoth [53], where effect sizes between 0.26 – 0.38 were reported. This indicates that with an expected effect size of 0.25 (Cohen’s d) a total sample size of 506 students would be required to achieve 80% power at the 5% confidence level.

### 3.1.2.2 Study design

The trial was carried out 2003-2006, with the intervention taking place 2003. See outline of the study design below.



### 3.1.2.3 Participants

Paper II included 441 parents of 6<sup>th</sup> grade students in the cluster randomized controlled trial. Only parents in the intervention arm were included. Data was obtained from baseline questionnaires to parents. Measures included demographics, parental warmth, rule setting, perception of norm-breaking behaviours, knowledge of school performance, and parental attitude towards youth and alcohol.

Data for paper III was obtained from 587 students in the cluster randomized controlled trial. Measurements on being drunk (lifetime and past 30 days), tobacco use, illicit drug use, and other norm-breaking behaviours were assessed by self-reports from questionnaires in grade 6, 7, 8, and 9.

In paper IV data was obtained from 587 students and parents. Predictor variables were obtained in grade 7, and outcome variables in grade 9.

## **3.2 STATISTICAL ANALYSES**

### **3.2.1 Paper I**

A descriptive approach was used in paper I, this included meetings with reference groups, telephone interviews, a pilot study involving course evaluations, and focus group interviews.

### **3.2.2 Paper II**

In paper II multiple logistic regression analyses were performed for program participation, and for program retention.

### **3.2.3 Paper III**

In paper III baseline equivalence, being drunk – lifetime, tobacco use, and illicit drug use, was examined with  $\chi^2$  analyses. Parent's age was examined with *t*-tests for independent groups. Being drunk in the past 30 days, and other norm-breaking behaviours were analysed with general linear model (GLM) for repeated measures. Univariate analysis of covariance was used to control for gender and socio-economic status. Missing values on outcome variables were imputed using the Statistical Analysis Software (Version 9.1.3) multiple imputation procedure with the Markov chain Monte Carlo (MCMC) method following the recommendation of Rubin [71-72]. To check for baseline differences between treatment conditions on demographic and psychosocial variables were examined using chi-square tests for categorical variables and one-way analysis of variance (ANOVA) for continuous variables. Effect sizes (Cohen's *d*) were calculated by taking the difference in pre- to post-measure means (or pre- to follow-up) for each group and dividing these by their pooled standard deviations. Multiple regression analyses were conducted to evaluate the effect of potential moderators of MST effectiveness on each of the outcome measures.

### **3.2.4 Paper IV**

Univariate, and multiple logistic regression analyses with all variables entered simultaneously were employed in paper IV to assess the association of alcohol,



tobacco, and illicit drug use with a number of risk and protective factors. Missing values on outcome variables were adjusted for by multiple imputation procedure with the Markov Chain Monte Carlo (MCMC) method [71].

## **4 ETHICAL CONSIDERATIONS**

The study has been approved by the Research Ethical Committee at Karolinska Institutet on 11 February 2002 (Dnr 02-025).

The aim of this project was to make a cultural adaptation of a family-based program to prevent problems with alcohol and other drugs among adolescents. The benefits that this could lead to are very important from a public health perspective, and the possible risks of the project must be weighed against the benefits. Ethical issues that may arise concern violation of privacy of the respondents (i.e. students and parents) in regard to their participation in the survey where questions were asked about lifestyle and alcohol use. In view of the fact that all data collected were coded, and unidentified, the risk must be considered as low. The questionnaires have been stored in a special safety cabinet, which only the researchers have had access to. Furthermore, an active consent from parents was required for the students to participate in the survey. Students were also informed that all participation was voluntary, and they could cancel participation at any time. At each survey wave the students' questionnaires were collected in the school by one person from the research team. All students were assured anonymity.

## **5 RESULTS**

### **5.1 PAPER I: CULTURAL ADAPTATION OF THE STRENGTHENING FAMILIES PROGRAMME TO A SWEDISH SETTING**

The main result from this paper suggests that it is possible to transport prevention programs across cultures and make them feasible and attractive to large group of parents, especially if care is taken to make adjustments to local conditions. One major change in the Swedish version of the Strengthening Families Program relates to the program format. In the original program youth and parents attend separate sessions the first hour followed by a joint family session the second hour. This was not feasible to do in our study due to practical and financial reasons. In our case schools were the best setting for the program, but teachers could not work both day and evening, therefore we made a compromise to let the youth have their sessions during day time led by their class teacher, and assisted by a leader. That leader was also in charge of the parent sessions held in the evening. Instead of having one family session each time, we chose to have a total of two. The original SFP 10 – 14 consisted of seven sessions, and four optional booster sessions. The Swedish version incorporated the booster sessions into a regular part called part two, and also added one extra session. Consequently the Swedish version comprised part one with seven sessions, and part two with five sessions. The core elements were kept intact, but more emphasise was put on alcohol and other drugs in part two.

### **5.2 PAPER II: PARENTAL PARTICIPATION AND RETENTION IN AN ALCOHOL PREVENTIVE FAMILY-FOCUSED PROGRAMME**

Findings from this paper showed that predictors for parental program recruitment were having a low score on a scale measuring parents' emotional warmth, and having a more restrictive attitude towards youth and alcohol. Retention in the program was associated with being born in Sweden, and having a low score on the scale measuring warmth. Parents' gender, age, education, gender of target child, living full-time with target child, parents' awareness of their child's norm-breaking behaviours, rule setting, and knowledge of school performance were not associated with participation or retention in the program, indicating that the program seems to attract most types of parents in the general population.

### **5.3 PAPER III: EVALUATION OF A SWEDISH VERSION OF THE STRENGTHENING FAMILIES PROGRAMME; THREE-YEAR OUTCOMES OF A CLUSTER RANDOMIZED TRIAL**

In this paper no effects were found for alcohol, tobacco, and illicit drug use between the intervention group and the control group. Nor did moderators like gender, ethnicity, parent's age or education or SES affect the result.

The repeated-measures GLM showed an interaction time x group effect,  $F_{(3,284)} = 3.97$ ,  $P < 0.01$ , for norm-breaking behaviours, which increased more over time in the intervention group than for the control group, also after controlling for baseline differences.

There were no differences between boys and girls on the measure being drunk – lifetime on any occasion, with the exception of 8<sup>th</sup> grade boys in the intervention group that had been drunk (lifetime) to a larger extent than boys in the control group;  $\chi^2_{(1)} = 4.23$ ,  $P < 0.05$ . There was also a significant increase in tobacco use in grade 9 for boys in the intervention group compared to boys in the control group;  $\chi^2_{(1)} = 5.70$ ,  $P < 0.05$ . No differences between genders for being drunk in the past 30 days, for illicit drug use, and for other norm-breaking behaviours were found.

The intervention and control group did not differ significantly on any background data.

### **5.4 PAPER IV: EFFECTS OF A FAMILY-FOCUSED PREVENTIVE PROGRAM ON PREDICTORS OF ADOLESCENT USE OF ALCOHOL AND OTHER DRUGS**

Results from this paper showed that high parental knowledge, parents with a restrictive attitude towards youth and alcohol, and youth with a positive school climate were associated with a lower risk of alcohol and other drug use. Youth with high norm-breaking behaviours, youth attending a school in an area with high socioeconomic status, and youth with parents born in Sweden were more likely to use alcohol and other drugs. There was no impact from parental participation in the Swedish version of the Strengthening Families Program on adolescent alcohol and other drug use.

Univariate logistic regression showed that high norm-breaking behaviour in grade 7 was a strong risk factor for alcohol use two years later, in grade 9, for both boys

(OR=3.07, 95% CI 1.73-5.47) and girls (OR=2.75, 95% CI 1.62-4.68). Additional risk factors for girls to have been drunk were having Swedish born parents (OR=3.10, 95% CI 1.44-6.68), and attending a school in a neighbourhood with high socioeconomic status (OR=2.44, 95% CI 1.32-4.50). A good school climate was associated with a lower risk of having been drunk for boys (OR=0.41, 95% CI 0.24-0.68). Protective factors for alcohol use in girls were parental knowledge (OR=0.42, 95% CI 0.25-0.70), and living with parents full-time (OR=0.30, 95% CI 0.12-0.79).

Tobacco use in grade 9 was associated with norm-breaking behaviour in grade 7 for boys (OR=3.09, 95% CI 1.30-7.33), and for girls (OR=4.09, 95% CI 1.82-9.18). For boys having a good school climate was protective (OR=0.37, 95% CI 0.19-0.74). Parental knowledge was linked to reduced tobacco use in both boys (OR=0.38, 95% CI 0.19-0.78) and girls (OR=0.36, 95% CI 0.18-0.69). For girls to live full-time with parents was also protective (OR=0.36, 95% CI 0.15-0.85).

Norm-breaking behaviour was associated with a higher risk of having used illicit drugs in girls (OR=4.79, 95% CI 1.06-21.56). Protective factors for illicit drug use included parental knowledge for boys (OR=0.09, 95% CI 0.02-0.41) and for girls (OR=0.25, 95% CI 0.07-0.91), and a good school climate (OR=0.30, 95% CI 0.11-0.79 for boys, and OR=0.06, 95% CI 0.01-0.48 for girls). An additional protective factor for boys and illicit drug use was to live full-time with parents (OR=0.22, 95% CI 0.09-0.57).

## **6 DISCUSSION**

Alcohol and other drug use among adolescents are of great concern not just in Sweden, but also in the rest of the world. Various approaches have been developed and studied with the aim to prevent underage substance use. Several of these interventions originate from the United States, where studies suggest family-focused programs as promising strategies for the prevention of adolescent use of alcohol and other drugs. Underlying theories in effective prevention programs are derived from a risk and protective factors approach. The Strengthening Families Program: For Parents and Youth 10–14 (SFP 10–14), represents a good example of a successful family program which has been evaluated in the US with good results. Accordingly, a Swedish version of the SFP 10–14 was developed and evaluated. This entailed firstly a cultural adaptation of the program to Swedish conditions, and secondly a cluster randomized controlled trial. In addition, determining factors for parental participation, and predictors of adolescent substance use were examined; all of this constitutes the topic of this thesis.

### **6.1 PAPER I**

In this paper a cultural adaptation of a family-focused prevention intervention including program development, and a pilot study was described. The complexity of transporting evidenced-based programs from one cultural setting to another was central in this study. After discussions with a reference group of teachers we decided to make a change in the program format of the Swedish version of the SFP 10–14. This resulted in a version where youth sessions were held during the day, and parent sessions were held in the evening. Instead of having one family session each time, we chose to have only two in all. This was due to the fact that we were not able to have teachers working as facilitators both day and evening. However, all core components of the program were implemented.

When the Swedish version, Steg-för-Steg, was first tested in a pilot study in two schools in Stockholm, the recruitment rate was rather high, 53 % of the students had at least one parent participating in part one of the program. In other studies recruitment rates as low as 16 % have been reported for another drug abuse prevention program [73], and in Spain only 1 % of parents attended at least one session in a Life-Skills Training Program [74].

The Swedish version of the SFP 10–14 was positively received by the participating families, as well as the facilitators.

It appears possible to adapt prevention programs from one country to another, especially if care is taken to disseminate the core elements, and to find a compromise between the theoretically desirable, and the practically possible. The process raises the question whether these compromises reduces the effectiveness of the program.

## **6.2 PAPER II**

The objective of paper II was to examine the predictive factors for parents to attend a family program, and also to see what factors keep them in the program. Two predictive factors for participating were found. Firstly, parents with a low score on a scale measuring emotional warmth did participate to a greater extent than parents with a high score on the measure for warmth. Secondly, a more restrictive attitude towards youth and alcohol was associated with participation. Retention in the program was associated with being born in Sweden, and to have a low score on the scale measuring warmth. From prior research conducted by others [75-78], important aspects of parental participation, and retention were well known. This included back ground factors like gender, age, education, family situation, and working conditions. However, none of these factors were found to be important in our study.

Surprisingly, parents less emotionally warm were more likely to participate, than “warmer” parents. Warmth is often referred to in the behavioural research literature as a concept in the dimension of responsiveness, and supportiveness [79-80]. Hence, warmer parents would be expected to be more responsive, and supportive, and for that reason attend the program. On the other hand, parents who are more analytical and reasoning in a more rational way may be perceived as less warm. Those parents are maybe more prone to take advantage of new knowledge in order to be prepared if and when problems will arise. The warmer parents may reason that they already have a good relationship with their child, and they are less worried about future problems, consequently they do not see a value in participating.

More corresponding to our assumptions were the finding that parents with a more restrictive attitude towards youth and alcohol, were more likely to participate. A more

restrictive attitude could imply a concern for these matters, resulting in a motivation to participate in a program like this.

The finding that retention in the program was related to being born in Sweden could mean that there is a language or cultural barrier in the program. This was an important finding for future program developments; prevention programs have to meet the needs of parents of different ethnicity.

### **6.3 PAPER III**

Paper III addressed the effects of the Swedish version of the Strengthening Families Program on adolescent use of alcohol and other drugs. Contrary to prior research conducted by the program developers [53-54] we did not see any effects of the program in Sweden.

In the Swedish version of the program we had to make some adjustments to make it work in Sweden. This entailed a change in program format so that we did not have as many joint family sessions as in the original version. Possibly, the missing family parts are vital to the effectiveness of this program. On the other hand, all core components of the original SFP 10–14 were included in our version of the program. It is crucial to maintain the fidelity of prevention programs. In this case the SFP 10–14 was manual based with all parts described and timed in detail, thus fidelity would not be a major source of concern – aside from the changes made in the program format.

Contextual differences between Sweden and the United States may have contributed to the results of the evaluation. Sweden has a well developed social welfare system, and there are relatively small disparities in social class, and other socio-demographic factors. The absence of any difference between the intervention and the control group could therefore be due to a ceiling effect, where it becomes difficult to show effects of this type of program.

Furthermore, contamination in the form of other preventive ATOD (alcohol, tobacco and other drugs)-efforts in the control schools may diminish the differences.

When programs are first tested by developers and researchers, the conditions are optimal, and the effects are often superior compared to the effects of effectiveness



trials, where the conditions are real-life settings. The challenge of moving prevention program from efficacy to effectiveness studies is currently a topic of debate among program evaluators [81].

#### **6.4 PAPER IV**

This paper examined factors associated with adolescent use of alcohol and other drugs. Our hypotheses that parents are important in protecting adolescents from alcohol and drug use, and that norm-breaking behaviours are risk factors for adolescent substance use, were confirmed. However, we did not see any enhanced protection of parental program participation.

Youth with parents who have knowledge about their children's whereabouts, with whom they socialize with, how they spend their money, and how they are doing in school are less likely to be have been using alcohol and other drugs. The concept of parental knowledge may include both parents' own solicitation and control, as well as the willingness of the child to disclose information [82]. Others [83] argue that monitoring and tracking their children's whereabouts is only an action of the parent.

Parents' restrictive attitudes towards alcohol and youth seemed to decrease the risk of having been drunk, and for tobacco use, but these associations were not statistically significant except for alcohol use and boys. There seem to be a discrepancy between boys and girls in the strengths of the predictors for substance use. For example having immigrant parents was associated with a lower risk of alcohol use in girls, but not in boys. Likewise, high socioeconomic status was shown to be related to increased risk of alcohol use especially for girls.

The finding that a good school climate was protective against substance use was in line with other studies [37-39, 84], and not surprisingly, norm-breaking behaviours were associated with an increased risk of substance use. Both findings are well-worth to take into account for future strategies in development of preventive interventions.

#### **6.5 STRENGTHS AND LIMITATIONS**

Among the strengths in this thesis are it's basis on a randomized controlled trial, high participation and low attrition in the surveys, reports from both students and parents,

and a successful implementation of a Swedish version of the Strengthening Families Program.

One limitation that could possibly account for the lack of positive outcomes relates to the modifications of the program that we had to do in order to make it work in a Swedish setting.

## **6.6 COMMENT ON THE TRANSPORTABILITY OF PREVENTION PROGRAMS**

This thesis presents results from studies of family based prevention of alcohol and other drugs. While the results indicate that a family program like the Strengthening Families Program can be transported from its American origin to Stockholm, and that many parents can be recruited to participate in the program, no effects were found for the program, neither on substance use among the adolescents nor on the risk and protective factors that the program aims to affect.

This lack of positive outcome could be due to several factors. One possibility is that despite the attempts to culturally adapt the program to Swedish conditions it still does not resonate with Swedish attitudes; something is “lost in translation”. Another possibility is that the changes that were made to the program format reduced its effectiveness; especially the reduction in the number of family sessions has given rise to this type of concern.

Both these cases lead to a general observation regarding the fragility of this type of prevention program and their long term viability. The Strengthening Families Program represent a highly complex intervention, requiring detailed manuals, extensive training of practitioners, supervision and other forms of technical support. Fidelity to the program is frequently and strongly emphasised, suggesting that even small deviations from the manual would compromise effectiveness, raising questions about the robustness of the core components of the program.

Despite a long term effort, with an unusual level of funding, no positive results could be demonstrated. This experience is not unique. Similar experiences have been documented from several countries, including Norway and the United States, resulting in calls for more translational research [85-87]. In both Sweden and Norway extensive

efforts have been undertaken to implement evidence based programs, mostly originating in the United States, without any demonstrable effects on consumption or harms [86, 88].

This observation has given rise to calls for simplification, identification of core concepts and dissemination of these [88]. It seems likely that in the long term such approaches would be more successful.

## 7 CONCLUSIONS

This thesis has added new knowledge to the field of substance use prevention among adolescents, and in particular the role of parental involvement in preventive interventions. The following conclusions can be drawn:

- It is possible to transport prevention programs across nations, especially if care is taken to make cultural adaptations without losing the core elements. Considerations must be taken of the dilemma with fidelity versus adaptation, and a compromise between the theoretically desirable and the practically possible must be found. It remains unsettled whether these adaptations compromise the effectiveness of the programs.
- Only a few predictors of participation and retention of parents in the program were found in the Swedish version of the Strengthening Families Program 10 – 14, indicating that the program attracts most types of parents in the general population. The fact that participation was predicted by having a low level of warmth implies that parents with a stronger felt need of parental training and support are recruited. Additionally, parents with a restrictive attitude towards alcohol and youth, appear more willing to participate. The finding that retention was greater among parents born in Sweden, indicates that efforts must be taken in meeting the needs of parents of different ethnicity
- There were no effects found for the Swedish version of the Strengthening Families Program 10 – 14 on adolescent use of alcohol and other drugs. Contextual differences between Sweden and the United States may have influenced the result; the lack of differences between the intervention group and the control could be due to a ceiling effect, where it becomes difficult to demonstrate any effects of this type of program.
- The Swedish version of the Strengthening Families Program 10 – 14 did not show any impact on predictors of adolescent use of alcohol and other drugs. However, important protective factors for adolescent substance use were found including parental knowledge and parents' restrictive attitude towards alcohol and youth. A strong risk factor for adolescent substance use was norm-breaking behaviours, indicating that more focus must be placed on these issues when developing new strategies for alcohol and drug prevention programs.

## 8 SVENSK SAMMANFATTNING

Alkohol och andra droger bland ungdomar är ett bestående folkhälsoproblem. Flera metoder har utvecklats och utvärderats i syfte att förhindra användningen av alkohol och andra droger hos minderåriga. Lovande strategier i det förebyggande arbetet har varit att inkludera föräldrar. Ett program som särskilt lyfts fram är the Strengthening Families Program 10-14 (SFP 10-14). En kulturellt anpassad version av SFP till svenska förhållanden har utvecklats. Programmet heter Steg-för-Steg och en randomiserad kontrollerad studie har genomförts för att utvärdera effekterna av programmet på ungdomars alkohol- och droganvändning. Denna avhandling är uppbyggd kring planering, genomförande och resultat av den randomiserade kontrollerade studien med syftet att undersöka vilken roll föräldraprogram har när det gäller att minska problem med alkohol och andra droger bland ungdomar.

Denna avhandling bygger på fyra artiklar. Den första artikeln är en beskrivande studie av planeringen och utvecklingen av Steg-för-Steg programmet. Dessutom presenteras en pilotstudie med två årskurs 6- klasser från två skolor i Stockholm. De övriga tre artiklarna är baserade på en randomiserad kontrollerad studie där 707 elever och deras föräldrar från 19 skolor i Stockholm ingår. För ungdomarnas medverkan i studien krävdes ett aktivt medgivande från deras föräldrar och den slutgiltiga studiepopulationen bestod av 587 elever och alla föräldrar oberoende av deras barns deltagande eller inte. I artikel II undersöks bestämningsfaktorer för föräldrars deltagande och retention i Steg-för-Steg programmet, detta analyseras med multipel logistisk regression. Data kommer från 441 föräldrar till barn i årskurs 6 i interventionsgruppen i den randomiserade kontrollerade studien. I artikel III analyseras effekterna av Steg-för-Steg programmet på ungdomars bruk av alkohol och andra droger. General Linear Model används för att analysera alkohol- och normbrytande beteende hos 587 elever vid fyra tidpunkter. Artikel IV handlar om att belysa effekten av Steg-för-Steg programmet på bestämningsfaktorer för ungdomars alkohol- och annat drogbeetende. Analyserna utgörs av univariat och multipel logistisk regression på data från 587 elever och deras föräldrar. De predicerande variablerna kommer från årskurs 7, medan utfallsvariablerna kommer från årskurs 9.

Resultatet från artikel I visar att det är möjligt att överföra ett familjebaserat program från ett land till ett annat, speciellt om man är noggrann med att anpassa programmet till lokala förhållanden utan att förlora programtroheten. Artikel II visar att föräldrar med en lägre grad av emotionell värme deltar i Steg-för-Steg programmet i större

utsträckning än de med högre grad av värme. Dessutom visas att föräldrar med en restriktiv attityd gentemot ungdomar och alkohol deltar i högre grad. Retention i programmet var associerat med att vara född i Sverige samt att ha en låg grad av värme. Resultat från artikel III visar på att inga effekter kunde ses i den randomiserade kontrollerade studien av den svenska versionen av the Strengthening Families Program avseende ungdomars användning av alkohol, tobak och narkotika. Slutligen visas i artikel IV att faktorerna hög föräldrakännedom, föräldrar med en restriktiv attityd gentemot ungdomar och alkohol och ungdomar med ett bra skolklimat var förenat med en lägre risk att använda alkohol och andra droger. Ungdomar med högt normbrytande beteende, ungdomar som gick i en skola i ett område med hög socioekonomisk status samt ungdomar med svenskfödda föräldrar var mer benägna till att använda alkohol och andra droger. Steg-för-Steg programmet hade ingen inverkan på risk-och skyddsfaktorer för ungdomars användning av alkohol och andra droger.

Slutsats. Även om det är möjligt att överföra ett familjeprogram, såsom the Strengthening Families Program, från dess amerikanska ursprung till Sverige, och också att många föräldrar kan rekryteras till att delta i programmet, har inga effekter hittats för programmet, varken på ungdomars drickande eller på de risk-och skyddsfaktorer programmet syftar till att påverka.

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