

# PERCEIVED RISK OF CANNABIS USE AND CANNABIS USE AMONG SWEDISH YOUTH

A quantitative study from a public health perspective

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# ABSTRACT

**Background:** Risk perception has been studied concerning the use of marijuana and it impacts the intention to use that specific substance.

**Aim:** The aim was to study the association between the perceived risk of cannabis use and cannabis use among Swedish youth after controlling for gender, age, and education. The aim was also to study whether the association between the perceived risk of cannabis use and cannabis use was different according to gender.

**Method:** The thesis project was based on data from the Flash Eurobarometer 330 - Youth Attitudes on Drugs.

**Results:** When age and education were controlled for, both among Swedish youth and among male participants, the perceived risk had an association with cannabis use - higher risk perception entailed a lower use.

**Discussion:** The association between the perceived risk of cannabis use and cannabis use appears to be due to the impact of risk perception on behaviour.

**Conclusion:** By preserving the risk perception that Swedish youth have of cannabis, it may be possible to protect them from the potential harm that cannabis use cause.

**Keywords:** Cannabis use, Flash Eurobarometer 330 - Youth Attitudes on Drugs, perceived risk of cannabis use, public health sciences, Swedish youth, quantitative study.

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# 1 INTRODUCTION

In many countries, governments implement restrictions and measures to tackle the use of psychoactive substances. However, from a global perspective, developed countries are unfortunately facing a high prevalence of the use of illicit drugs among their populations (Kázmér et al., 2019). Furthermore, having an understanding of the risk that drugs entail, is highlighted as a leading indicator of use change (Ayllón & Ferreira-Batista, 2018). From a European perspective, certain age groups have a higher prevalence of illicit drug use such as cannabis use than other age groups, that is, adolescents and young adults tend to use illicit drugs to a higher extent. In addition, a harmful impact could occur for those individuals and groups that choose to use drugs. Mental and physical health can be altered and that is especially the case when using cannabis early in life (Kázmér et al., 2019). Furthermore, cannabis exists in different forms and preparations such as, for example, marijuana, hashish, and hashish oil (World health organisation, [WHO], 2016). Ultimately, those individuals that choose to use marijuana during a short period have a risk of weakening their judgment, short-term memory, and motor coordination. Furthermore, those individuals that choose to use marijuana for a long period or are heavy users in most cases negatively impact their brain development, as well as are at risk of becoming addicted to the drug (Volkow et al., 2014). In addition, risk perception has been studied concerning the use of marijuana. Clarifying that, it impacts the intention to use that specific substance (Lopez-Quintero & Neumark, 2009).

The health belief model describes that when a person believes that he or she is at risk the person acts in a preventive manner. The health belief model also describes that when a person believes that he or she is not at risk the person at times pursues unhealthy behaviours (Hayden, 2019). By therefore studying the association between the perceived risk of cannabis use and cannabis use among Swedish youth, there is a possibility to understand whether the perceived risk of cannabis use impacts their cannabis use. That in turn, could clarify whether perceived risk is a factor of importance to prioritize when developing relevant public health interventions that target the use of cannabis. Thus, striving to protect their health status from health-related consequences. That in turn requires investigation about the association between the perceived risk of cannabis use and cannabis use from multiple perspectives, which the present thesis project intended to explore.

## **2 BACKGROUND**

### **2.1 Perceived risk**

Perceived risk is a concept that several theories grasp such as the social cognitive theory, the health belief model, the theory of reason action, and the decision theory. Perceived risk regards the perception as well as the effect that an action or behaviour may cause if an individual would engage in a specific manner. Simply stated, perceived risk relates to the overall question – how would something impact me or others? (Danseco et al., 1999). In addition, whether or not an individual believes that an action or behaviour is of risk is dependent upon each individual's subjective judgment concerning the situation (Lopez-Quintero & Neumark, 2009).

### **2.2 Perceived risk of cannabis**

There are dimensions of the perceived risk of marijuana that have been studied concerning areas as well as characteristics of the phenomena. Dimensions of the perceived risk of marijuana, for example, regards the dimensions social consequences, personal consequences or physical harm, and legal consequences. The dimension social consequences have been studied to the areas of peer disapproval and parental disapproval. The dimension of personal consequences or physical harm has been studied concerning the areas of cognitive and academic deficiencies, physiological effects, and emotional impairments. The dimension legal consequences have been studied to the area's likelihood of arrest and likelihood of committing a crime. Further, dimensions of the perceived risk of marijuana are, for example, severity, locus of harm, and level of use. The dimension severity has been studied concerning the characteristics of no danger to great danger, no risk to great risk, and no harm to very great harm. The dimension locus of harm has been studied to the characteristics of harm against oneself and harm against others. Lastly, the dimension level of use has been studied to the characteristics of regular use, experimental use, and occasional use (Dansecco et al., 1999).

#### **2.2.1 *Factors related to perceived risk of cannabis use***

Other individuals' perceptions of marijuana impact people's use of marijuana. These individuals can, for example, be parents, and even each parent impacts their child. Research shows that teenagers that have parents that disapprove of drugs to lower extent use drugs. Research also shows a similar trend for peer disapproval, that is, that adolescents that have peers that disapprove of marijuana to a lower extent use that drug. In addition, peers could, for example be, close friends, a friend, best friends, or people from school. Furthermore, fear of getting arrested and use of marijuana among youth impacts each other. Those youth who fear the legal consequences of using marijuana less often, for example, abuse marijuana or other substances (Dansecco et al., 1999). Ultimately, many school-attending adolescents that

were between the ages of 12 and 21, reported that they perceived regular use of marijuana as risky (Lopez-Quintero & Neumark, 2009). Regarding perceptions of the risk of substance use, research indicates that people often report that the risk concerning one's personal use is lower than the risk for people in general (Danseco et al., 1999).

The perceived risk of cannabis is different among groups, for example, among males and females as well as among adolescents and adults. It has been reported that males in comparison to females more often perceive the harmfulness of marijuana as low. It has also been reported that adolescents in comparison to adults often act as if they are invulnerable. That is, that adolescents at times are optimistic about avoiding the harm that marijuana may cause with its use (Danseco et al., 1999). Furthermore, girl's marijuana perception differentiates from boy's marijuana perception. Girls perceive the substance as risky to a higher extent than boys (Terry-McElrath et al., 2017).

### **2.3 The use of drugs and illicit drugs from a past and present point of view**

From a historical perspective, drugs have been used in many countries around the world among different social classes within a given society and concerning the cultural practice of groups. Firstly, it is known that during ancient Greece it was common to use alcohol as an intoxicant. Secondly, it has been revealed that groups from South America previously chewed leaves which consequently make up cocaine production. Lastly, in China, a specific drug has been used both as an intoxicant and as a medicine which was opium (Mousavi et al., 2014).

From a contemporary perspective, in 2009, the global annual prevalence rate of using illicit drugs among individuals who were 15 to 64 years old, were 3.30-6.10%. The following year in Europe, the prevalence rate of using cannabis was 6.80% (Mousavi et al., 2014). There is a clear understanding of the drug use and illegal drug use that young people in Europe consume. Regarding the use of drugs in 2015, it emerged that among those aged 15 to 34, 17.8 million reported that they had used drugs. Regarding the use of cannabis in 2015, it emerged that 16.6 million, that is 13.3%, had used that specific drug (Ayllón & Ferreira-Batista, 2018). Further, in Sweden, there are low levels of illicit drug use among youth. In the ESPAD countries approximately 19% of the boys and 14% of the girls stated that they had used illicit drugs at least once during their lifetime. Concerning the use of cannabis, in most cases, boys tend to use cannabis to a higher extent than girls (ESPAD, 2019).

There is a growing cultural acceptance concerning the use of illicit drugs. That is, for example, the case for the use of cannabis among youth. The normalization of cannabis is not only common among those who tend to use it, but also among those who do not use it (Karlsson et al., 2019). The use of psychoactive substances among youth, that is, use of cannabis, LSD, alcohol, cocaine, amphetamine, or ecstasy can, in turn, be due to different motives. The motives for using two or more are, for example, to relax, feel better, keep awake at night while socializing, or alleviate depressed mode. Other motives are, for example, to become intoxicated, enhance an activity, or increase self-confidence (Boys et al., 2001).

## **2.4 Cannabis**

Cannabis originates from plants. Cannabis consists of a variety of elements such as, for example, Delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD) which differ from each other. THC generates a psychoactive effect while CBD lacks psychoactive properties, and is therefore at certain times used to treat multiple health-related conditions. Those conditions are, for example, posttraumatic stress disorder, seizures, insomnia, and chronic pain (Hunt et al., 2020).

### ***2.4.1 Factors related to substance use in general and cannabis use in particular***

Understanding the factors related to the use of drugs is well established. These factors operate on multiple levels such as on the individual level, the community level, and the societal level. Furthermore, there is a difference between the prevalence of girl's and boy's substance use, where boys tend to consume substances to a higher extent (Kázmér et al., 2019). That is also the case for Swedish adolescents (Mousavi et al., 2014). Research among Swedish youth, attending 9th and 11th grade, showed that truancy, early debut of binge drinking, and parents' ignorance about students' whereabouts were some factors which were associated with using cannabis. Truancy, early debut of binge drinking, and parents' ignorance about students' whereabouts increased the risk of using cannabis (Karlsson et al., 2018).

When it comes to adults, males and not females report higher consumption of substance use (Gray & Squeglia, 2018). In addition, there is a higher prevalence of daily cannabis smoking among boys. Further, more factors are related to adolescent's cannabis use. These factors are, for example, concomitant tobacco use, having separate or divorced parents, relatively heavy alcohol use, and displaying antisocial behaviours such as stealing, interpersonal aggression, or damaging properties (Tu et al., 2008). For adolescents, in particular, sleep problems, early experience of traumatic life events, or peer substance use can also serve as risk factors for substance use. Even lack of parental supervision and parental exposure to drugs can serve as risk factors for substance use (Gray & Squeglia, 2018). In addition, age is claimed as a significant predictor of cannabis use (Kázmér et al., 2019). When it comes to the use of cannabis, adolescents use cannabis more frequently in comparison to young adults (Hawke et al., 2018). Moreover, older adolescents seem to use drugs more often than younger adolescents (Vuolo, 2012).

In addition, a higher prevalence of cannabis use is noticed among adolescents of families with low socioeconomic status, in comparison to adolescents of families with high socioeconomic status. Following, the use of cannabis has a relation to students' education level (Kázmér et al., 2019). That is, higher consumption of drugs is common among individuals that have finished high school but currently are not employed or a student. Furthermore, there is a difference between college-bound students' and non-college-bound students' use of illicit drugs. The difference is that non-college-bound students' more often use illicit drugs (Vuolo, 2012). Furthermore, research shows that, young individuals that do not attend a school or are absent from school to a greater extent use cannabis (Lynskey & Hall, 2000). In addition,



individuals that perceive a substance as risky are often those who later use those substances to a lower extent (Vuolo, 2012).

## **2.5 The association between the perceived risk of cannabis use and cannabis use**

There is a discussion about the association between the factors perceived risk and cannabis use. Volkow et al. (2014) does not give a specific clarification concerning the directionality of the association, that is, if the perceived risk has an association with cannabis use, or if cannabis use has an association with perceived risk. Although, Volkow et al. (2014) hypothesises about the direction of the association, stating that, a less perceived risk might increase the use of marijuana (Volkow et al., 2014). Even Bachman et al. (1988) have, for example, studied the association between perceived risk and the use of cannabis (Bachman et al., 1988). Ultimately, Lopez-Quintero and Neumark (2009) highlight the complexity of the association between perceived risk and substance use. Firstly, stating that it is a complex association concerning its directionality. Secondly, stating that it is a complex association concerning its temporality (Lopez-Quintero & Neumark, 2009).

One understanding about the association was studied among adolescents in the US as well as among young adults entering college in the US. The association was that a greater risk of marijuana use was related to less use (Bachman et al., 1998; Johnston et al., 2005; Kilmer et al., 2007). Another understanding in regard to the association was studied among adolescents in the US by Gerrard et al. (1996) and presented in a review by Sjöberg (1998). The association was that a higher perception of drug use-related risk was related to higher use. However, that association concerned drug use-related risk and not risk of marijuana use as in the former understanding (Gerrard et al., 1996; Sjöberg, 1998).

The association between perceived great and moderate risk of smoking marijuana regularly has been studied concerning adolescent's marijuana use in the US. The final result showed that there were protective associations between perceived great and moderate risk and adolescent's marijuana use. This association was in turn weekend among Black students and strengthen among Hispanic students. Further, among White students, males, and females the association was shown to be stable between 1991 to 2016 (Terry-McElrath et al., 2017). Research among Swedish youth, attending 9th and 11th grade showed that low risk perceptions, parental approval of smoking, dissatisfaction with school, tobacco use, and being a male were other factors which were associated with using cannabis. Low risk perceptions, parental approval of smoking, dissatisfaction with school, tobacco use, and being a male increased the risk of using cannabis (Karlsson et al., 2018). When cannabis related perceptions on cannabis use were explored among 15- and 16-year olds from Europe, including Swedish youth, the result indicated that individual perceptions correlate with cannabis use much stronger in comparison to distal influences (Piontek et al., 2013). Ultimately, the difference between the previous described studies and the thesis project was the desire to provide an up-to-date understanding about how risk perception relates to cannabis use among Swedish youth.

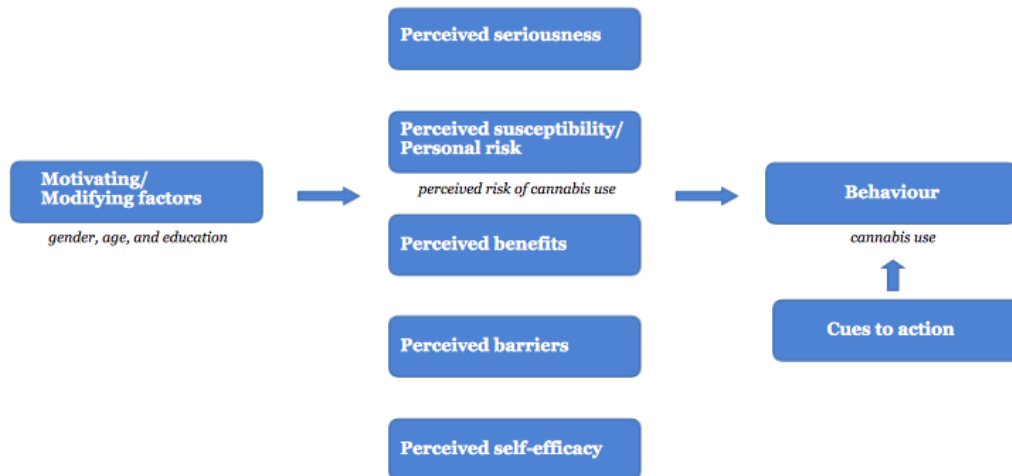
## 2.6 The health belief model

The health belief model centres around the aspect's beliefs and perceptions, and that those impact the actions that people have in everyday life. These beliefs and perceptions are in turn impacted by a variety of influencing elements. These are, for example, skills, religion, knowledge, experiences, and culture. Furthermore, it is possible to divide the model's parts into main concepts and additional concepts. Perceived seriousness, perceived susceptibility/personal risk, perceived benefits, and perceived barriers are the main concepts. Cue to action, motivating/modifying factors, and self-efficacy are the additional concepts (Hayden, 2019).

Perceived seriousness regards the beliefs about the severity of behaviour. That can in turn, for example, be influenced by experience or knowledge. In addition, the concept of perceived susceptibility/personal risk is recognised as a powerful perception. That is because when a person believes that he or she is at risk the person acts in a preventive manner to a higher extent. Consequently, when a person believes that he or she is not at risk the person at times pursues unhealthy behaviours to a higher extent. Perceived benefits are about whether or not an individual can identify a benefit with choosing a new behaviour. Perceived barriers regard whether or not an individual can identify obstacles with choosing a new behaviour (Hayden, 2019).

Furthermore, the factors that impact the perceived benefits are called motivating/modifying factors. Those are, for example, demographic factors (ethnicity, age, material status, gender), socio-psychological factors (social class, peer group, personality), and structural factors (experience, knowledge). Furthermore, cues to action regard shifting behaviour with the help of cues, which might be through health warning labels or by organizing events. Self-efficacy is about whether or not an individual believes in their ability to perform a certain behaviour. Meaning that, for example, if there is a belief in the ability to perform the behaviour, the person would perform the behaviour (Hayden, 2019).

Further, the additional concepts impress the main concepts which then generates behaviour (Hayden, 2019). Ultimately, the main concept of perceived susceptibility/personal risk is of relevance now. That is, that it can help explain and motivate why a particular association occurs. This is because the health belief model highlight that a high perceived risk leads to not engaging in a behaviour (Hayden, 2019). For example, not using cannabis in this case. The health belief model also describe that a low perceived risk leads to engaging in unhealthy behaviours (Hayden, 2019). For example, using cannabis in this case. Ultimately, the concept of perceived susceptibility/personal risk could be viewed as a contributing factor that explains the possible association between the perceived risk of cannabis use and cannabis use among Swedish youth. Additionally, gender, age, and education, hence motivating/modifying factors, could be viewed as underlying explanatory mechanisms that may influence the perceived susceptibility/personal risk (figure 1).



*Figure 1:* A construction of the health belief model in regard to the focus of the thesis project.

## 2.7 Relevance of the topic to public health

An individual that uses cannabis early in life is at risk for using harder drugs with time (Ayllón & Ferreira-Batista, 2018). Research based on Swedish men and women showed that there are consequences that follow due to life time cannabis use such as it increasing the use of other illicit drugs (Rabiee et al., 2020). Consequently, an individual is also at risk for mental and physical health-related implications when using cannabis early in life (Kázmér et al., 2019). Knowing that a consumption of cannabis is dangerous, points to the fact that, studying contributing factors that might relate to youths use of cannabis is relevant. Consequently, if an increased perceived risk of cannabis use relates to an increased use of cannabis among Swedish youth, a need for public health interventions is of importance that targets the probable misconception about the risk perception of cannabis. Ultimately, the benefit of this is that, by influencing the perceived risk that exists, it may impact a behaviour where youth later choose not to use cannabis. However, if an increased perceived risk of cannabis use relates to a decrease use of cannabis among Swedish youth, there may be a need to maintain the prevailing risk perception. By clarifying this, needs can be matched, thus facilitating the planning of relevant public health interventions.

## 2.8 Problem formulation

The association between the perceived risk of cannabis use and cannabis use has been studied before. From one perspective, it seems to be a negative association between the risk of marijuana use and use (Bachman et al., 1998; Johnston et al., 2005; Kilmer et al., 2007). From another perspective, it seems to be a positive association between drug use-related risk and use (Gerrard et al., 1996; Sjöberg, 1998). Previously, cannabis perceptions and cannabis use has been studied among, for example, younger youth (Karlsson et al., 2018; Piontek et al., 2013). Therefore, a research gap to explore was the association between the perceived risk of

cannabis use and cannabis use among an extended sample of Swedish youth, that is, among Swedish youth between the ages of 15 to 24.

The association can be studied from multiple perspectives. One such perspective is by studying the association after ruling out the unique effect of variables that are known to relate to the perceived risk of cannabis use and cannabis use. Previous research by Pacek et al. (2015) shows that it is more likely that, those who are 50 years old or older, those of a non-White race/ethnicity, and females to perceive regular cannabis use as risky, that is, perceive it as a substance that may harm themselves physically and in other ways, than those who are 12 to 17 years old, 18 to 25 years old, have a high school education or greater and engaged in past year non-daily and daily cannabis use (Pacek et al., 2015). It is also known that boys tend to consume substances to a higher extent (Kázmér et al., 2019). Consequently, adolescents use cannabis more frequently in comparison to young adults (Hawke et al., 2018). Research also shows that, young individuals that do not attend a school or are absent from school to a greater extent use cannabis (Lynskey & Hall, 2000). In regard to that, gender, age, and education will serve as potential impacting variables in relation to the association between the perceived risk of cannabis use and cannabis use among Swedish youth. Meaning that the association between the perceived risk of cannabis use and cannabis use will be explored after taking into account gender, age, and education.

Another perspective to study is whether the association between perceived risk of cannabis use and cannabis use differs regarding gender. The value of studying this is that it can contribute to an understanding of whether the association differs between boys/men and girls/women. It is important to clarify this because Naidoo and Wills (2016) describe that individuals differ from each other regarding a variety of health determinants such as gender (Naidoo & Wills, 2016). By therefore studying the association between the perceived risk of cannabis use and cannabis use concerning the determinant gender, that association can be highlighted to some extent. Ultimately, by studying those two perspectives, associations can be explored more in-depth rather than clarifying the first-hand nature of the association between the perceived risk of cannabis use and cannabis use among Swedish youth.

### **3 AIM AND STUDY QUESTIONS**

The aim was to study the association between the perceived risk of cannabis use and cannabis use among Swedish youth after controlling for gender, age, and education. The aim was also to study whether the association between the perceived risk of cannabis use and cannabis use was different according to gender.

#### **3.1 Study questions**

1. Was there an association between the perceived risk of cannabis use and cannabis use after controlling for gender, age, and education among Swedish youth?
2. Was the association between the perceived risk of cannabis use and cannabis use different according to gender among Swedish youth?

### **4 METHODS AND MATERIAL**

The present thesis project was based on secondary data, hence the Flash Eurobarometer 330 - Youth Attitudes on Drugs. The data was downloaded from Leibniz-Institute for the Social Sciences.

#### **4.1 Methodological approach and study design**

When conducting quantitative research, researchers carry out a deductive view on research and take an objective stance in regard to the study process. Furthermore, it is common to study, for example, the associations between variables (Bryman, 2016). The present thesis project was quantitative, since the focus was to study associations. The aim was to study the association between the perceived risk of cannabis use and cannabis use among Swedish youth after controlling for gender, age, and education. The aim was also to study whether the association between the perceived risk of cannabis use and cannabis use was different according to gender.

The research design that was implemented when Flash Eurobarometer 330 was carried out represent a cross-sectional design. A cross-sectional design was used since the information gathered concerned the same time point (Europäische Kommission, 2012). Furthermore, there are certain advantages and disadvantages to choosing cross-sectional surveys. An advantage is, for example, that implementing it is often of low cost. However, a disadvantage is that causal directions cannot be highlighted (Merrill, 2013).

## **4.2 Sample**

The sampling method that was chosen for Flash Eurobarometer 330 was probability sampling. However, which probability sampling method chosen was unclear (Europäische Kommission, 2012). Probability sampling is a sampling procedure where participants are selected by random. This in turn means that each study participant in relation to another study participant has an equal chance of being chosen. The benefit of this sampling procedure is that there is the possibility that the chosen participants procedure a representative sample. Consequently, producing a sample that may fairly represent the study population, thus facilitating the possibility to generalize findings (Bryman, 2016).

The target population was, in general, youth between the ages of 15 to 24. However, the age group of the participants from The United Kingdom was 16 to 24. Furthermore, the youth's were from 27 European countries, and the countries that were included were Portugal, Luxembourg, France, Czech Republic, Cyprus, Spain, Estonia, Netherlands, Germany, Belgium, Greece, Finland, United Kingdom, Malta, Sweden, Austria, Denmark, Italy, Hungary, Romania, Latvia, Lithuania, Bulgaria, Poland, Slovenia, Ireland, and Slovakia. Ultimately, 12313 youth participated in the study (Europäische Kommission, 2012). The weighting of the dataset, which occurred on a country level, produced representative samples of the general populations (Gallup Organization, 2011).

Furthermore, the country in focus for the present thesis project was Sweden. Ultimately, the sample consisted of 502 Swedish youth that were between the ages of 15 to 24.

## **4.3 Data collection**

### **4.3.1 Collection of data**

The data were collected through conducting telephone interviews with the study participants. The data was collected for five days, namely from the ninth of May 2011 to the thirteenth of May 2011 (Europäische Kommission, 2012). Furthermore, there are advantages and disadvantages to interviewing by telephone. An advantage is reaching participants that in most cases are hard to reach. Other advantages are the opportunity to save resources such as money and time. However, a major disadvantage is uncertainty about the responses, that is, that there is a possibility that participants may respond differently through telephone than in person (Block & Erskine, 2012).

### **4.3.2 Questionnaire**

The questionnaire consisted firstly of demographic-related questions and secondly of questions that focused on youths' attitudes on drugs (Appendix A). The following paragraphs explain the questions that were used for the thesis project.

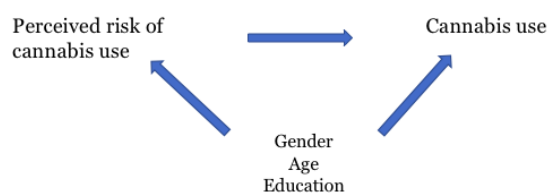
The first chosen demographic-related question was about gender. The interviewer filled in whether the participant was a male or female. The second demographic-related question chosen was: “How old are you?”. The third chosen demographic-related question was: “Are you currently a full-time student?”. The answer alternatives were: “yes” and “no” (Gallup Organization, 2011).

The fourth question chosen was: “To what extent do you think the following substances may pose a risk to a person’s health - use cannabis regularly?”. The answer alternatives concerning that question were: “high risk”, “medium risk”, “low risk”, and “no risk” (Gallup Organization, 2011). That question was chosen to study the perceived risk of cannabis use among Swedish youth.

The fifth question chosen was: “Have you used cannabis yourself?”. The answer alternatives were: “no, I have never used”, “yes, in the last 30 days”, “yes, in the last 12 months”, “yes, but more than 12 months ago”, and “you don’t want to answer”. In relation to that question, it was only possible to give one answer (Gallup Organization, 2011). The previous question was chosen to study cannabis use among Swedish youth.

### 4.3.3 Variables

The present thesis project focused on the main independent variable perceived risk of cannabis use, that is, the risk perception of using cannabis regularly, and the dependent variable cannabis use. Consequently, gender, age, and education, hence full-time studies, served as potential confounding variables, that is, these variables served as potential impacting variables concerning the association (figure 2). It was also of interest to study whether the association between the perceived risk of cannabis use and cannabis use was different according to gender.



*Figure 2:* The interrelationship between the variables perceived risk of cannabis use, cannabis use, gender, age, and education.

#### **4.3.4 Processing of the data**

The data were processed in regard to the categorical variable perceived risk of using cannabis regularly, hence a new variable was created. The question from the questionnaire was: To what extent do you think the following substances may pose a risk to a person's health - use cannabis regularly?. The answer alternatives were: "high risk" (1), "medium risk" (2), "low risk" (3), and "no risk" (4) (Gallup Organization, 2011). The answer alternatives were turned, hence recoded. Meaning that the new answer alternatives ranged from "no risk" (1), "low risk" (2), "medium risk" (3) to "high risk" (4).

The data were also processed in regard to the categorical variable cannabis use, hence a new variable was created. The question from the questionnaire was: "Have you used cannabis yourself?". The answer alternatives were: "no, I have never used" (1), "yes, in the last 30 days" (2), "yes, in the last 12 months" (3), "yes, but more than 12 months ago" (4), and "you don't want to answer" (5) (Gallup Organization, 2011). The variable was dichotomized, that is, the answer alternative: "no, I have never used" (1) was recoded into "No" (1) and the answer alternatives "yes, in the last 30 days" (2), "yes, in the last 12 months" (3), and "yes, but more than 12 months ago" (4) were recoded into "Yes" (2). The remaining answer alternative, "you don't want to answer", was treated as missing, since that answer alternative did not represent a "No" or a "Yes" regarding cannabis use.

### **4.4 Methods of analysis**

#### **4.4.1 The analyses**

The analyses performed were descriptive, a Chi-squared test, and logistic regressions. Field (2018), describes that binary logistic regression can be applied when the desire is to predict membership in regard to two specific groups while accounting for categorical predictors and continuous predictors. Logistic regression analysis takes part in a model-building process. In most cases, the desire is to find the most parsimonious model, that is, continuing the model-building process until only significant predictors are included in a final model. Furthermore, a commonly used variable entry procedure is to enter variables into the models in a theory-driven way at first, thus the hierarchical method is applied. Additionally, one main assumption that should be met when conducting a logistic regression are to have a binary outcome. Further, common values to report are odds ratio, 95% confidence interval, *p* values, and Nagelkerke. The coefficient of determination for logistic regression, hence Nagelkerk, can capture the significance of the model (Field, 2018). To describe the sample, multiple descriptive analyses and a Chi-squared test were conducted. To investigate study question one and two, two logistic regressions were performed. Logistic regressions were simply performed because it made it possible to predict membership towards cannabis use in regard to the perceived risk of cannabis use, hence in relation to the entire sample and in relation to gender while accounting for known predictors of different values.



#### **4.4.2 A step by step procedure of the analyses**

Descriptive analyses were carried out in regard to the background variables gender, age, and education (full-time studies). Descriptive analyses were also carried out in regard to the main independent variable perceived risk of cannabis use and the main dependent variable cannabis use. A Chi-squared test was also conducted concerning the two previously mentioned variables in regard to the variable gender.

To investigate the first out of the two study questions, that was, was there an association between the perceived risk of cannabis use and cannabis use after controlling for gender, age, and education among Swedish youth?, a binary logistic regression was conducted. When performing the binary logistic regression, the processed variable perceived risk of cannabis use (reference group “no risk”), the processed variable cannabis use (reference group “no”), the variables gender (reference group “female”), age (continuous variable), and education (full-time studies, reference group “no”) were used. The variable cannabis use served as the binary dependent variable. The variable perceived risk of cannabis use served as the main independent variable and was included in the first model. The variables gender, age, and education served as confounding variables and were included in the second model. Consequently, the model-building process continued until a parsimonious model occurred.

To investigate the second study question, that was, was the association between the perceived risk of cannabis use and cannabis use different according to gender among Swedish youth?, a binary logistic regression was intended to be conducted and performed separately among men and women. When the binary logistic regression was performed, the processed variable perceived risk of cannabis use, the processed variable cannabis use, and significant confounding variables from the previous binary logistic regression were used. In this case, the variable cannabis use served as the binary dependent variable. The variable perceived risk of cannabis use served as the main independent variable, thus included in the first model. The significant confounding variables were then included in the second model.

The significant level was set at  $p \leq 0.05$ . The statistical program Statistical Package for Social Sciences (SPSS, version 26) was used to investigate the aim of the thesis project.

#### **4.5 Research ethics**

When researching in Sweden within the field of humanistic-social science research, four ethical principles are vital to apply which are the information requirement, the consent requirement, the confidentiality requirement, and the utilization requirement. These requirements are applied in different steps in relation to the research process and by applying them, research can be conducted in a proper way (Vetenskapsrådet, 2002).

In the present thesis project, the data was not collected by the author which hindered the possibility to personally apply the information requirement and the consent requirement. Additionally, information on how those two requirements were applied was not specified. However, the confidentiality requirement and the utilization requirement were applied by the author. The confidentiality requirement was applied in two ways. Firstly, the data was

downloaded to a password-protected computer by the author and was kept on the computer during the thesis project, thus the data was protected from unauthorized persons. Secondly, the results from the analytical procedures were presented and described with general concepts at the group level, that is, youth that did participate were not exposed in a way that would disclose their specific statements. Ultimately, the utilization requirement was applied by agreeing that the data was only going to be used for the thesis project and not for other purposes or interests, which was agreed upon when the data was downloaded by the author.

## 5 RESULTS

### 5.1 Sample

The sample consisted of more male participants (55.0%) than female participants (45.0%). Half of the study participants were 22 to 24 years old (51.2%) and the age ranged from 15 to 24 years old ( $M=21.28$ ,  $SD=2.16$ ). There was an equal distribution of the number of study participants that were full-time students (50.0%) in regard to those who were not full-time students (table 1).

*Table 1:* Descriptive statistics in regard to the background variables (n=502).

Background variables	n (%)
<b>Gender</b>	
Male	276 (55.0%)
Female	226 (45.0%)
<b>Age</b>	
15-18	54 (10.8%)
19-21	191 (38.0%)
22-24	257 (51.2%)
<b>Currently a full-time student</b>	
Yes	251 (50.0%)
No	251 (50.0%)

The majority of the study participants stated that they thought that regular cannabis use was a substance that posed a high risk to a person's health (67.1%). The majority of the study participants also stated that they had never used cannabis (81.3%; table 2).

Table 2: Descriptive statistics in regard to the independent variable perceived risk of cannabis use and the dependent variable cannabis use (n=502).

Main variables	n (%)
<b>Perceived risk of cannabis use</b>	
High risk	337 (67.1%)
Medium risk	107 (21.3%)
Low risk	35 (7.0%)
No risk	8 (1.6%)
Do not know/No answer	15 (3.0%)
<b>Cannabis use</b>	
No, I have never used	408 (81.3%)
Yes, in the last 30 days	14 (2.8%)
Yes, in the last 12 months	25 (5.0%)
Yes, but more than 12 months ago	51 (10.2%)
You don't want to answer	3 (0.6%)
Don't know	1 (0.2%)

Among male participants, the majority of the participants were between 19 to 24 years old and the age ranged from 15 to 24 years old ( $M=21.41$ ,  $SD=2.15$ ). Among female participants, the majority of the participants were between 19 to 24 years old and the age ranged from 16 to 24 years old ( $M=21.14$ ,  $SD=2.17$ ). Among male participants, a few more were not currently full-time students (56.9%). Among female participants, a few more were currently full-time students (58.4%; table 3).

Table 3: Descriptive statistics in regard to gender and the background variables (n=502).

Background variables	Male n (%)	Female n (%)
<b>Age</b>		
15-18	25 (9.1%)	29 (12.8%)
19-21	104 (37.7%)	87 (38.5%)
22-24	147 (53.3%)	110 (48.7%)
<b>Currently a full-time student</b>		
Yes	119 (43.1%)	132 (58.4%)
No	157 (56.9%)	94 (41.6%)

The majority of male participants stated that they thought that regular cannabis use was a substance that posed a high risk to a person's health (56.5%). The majority of male participants stated that they had never used cannabis (75.7%). The majority of female participants stated that they thought that regular cannabis use was a substance that posed a

high risk to a person's health (80.1%). The majority of female participants stated that they had never used cannabis (88.1%; table 4).

*Table 4:* Descriptive statistics in regard to gender and the independent variable perceived risk of cannabis use and the dependent variable cannabis use (n=502).

<b>Main variables</b>	<b>Male n (%)</b>	<b>Female n (%)</b>
<b>Perceived risk of cannabis use</b>		
High risk	156 (56.5%)	181 (80.1%)
Medium risk	73 (26.4%)	34 (15.0%)
Low risk	31 (11.2%)	4 (1.8%)
No risk	7 (2.5%)	1 (0.4%)
Do not know/No answer	9 (3.3%)	6 (2.7%)
<b>Cannabis use</b>		
No, I have never used	209 (75.7%)	199 (88.1%)
Yes, in the last 30 days	11 (4.0%)	3 (1.3%)
Yes, in the last 12 months	15 (5.4%)	10 (4.4%)
Yes, but more than 12 months ago	37 (13.4%)	14 (6.2%)
You don't want to answer	3 (1.1%)	0 (0%)
Don't know	1 (0.4%)	0 (0%)

Among male participants, the higher the risk perception of cannabis use, the lower the use of cannabis ( $\chi^2=38.229$ ,  $df=3$ ,  $p<0.0005$ ). Among female participants, the higher the risk perception of cannabis use, the lower the use of cannabis ( $\chi^2=38.634$ ,  $df=3$ ,  $p<0.0005$ ). Further, a logistic regression was not run for female participants, since it was clearly noticed that the categories for female participants would not hold (table 5).

*Table 5:* Chi-square analysis of gender in regard to the independent variable perceived risk of cannabis use and the dependent variable cannabis use (n=263; n=220).

	<b>Cannabis use</b>			
	<b>Male No (n %)</b>	<b>Male Yes (n %)</b>	<b>Female No (n %)</b>	<b>Female Yes (n %)</b>
<b>Perceived risk of cannabis use</b>				
No Risk	2 (28.6%)	5 (71.4%)	0 (0.0%)	1 (100.0%)
Low Risk	14 (45.2%)	17 (54.8%)	0 (0.0%)	4 (100.0%)
Medium Risk	49 (69.0%)	22 (31.0%)	28 (82.4%)	6 (17.6%)
High Risk	135 (87.7%)	19 (12.3%)	165 (91.2%)	16 (8.8%)

Missing cases; male: 13. Missing cases; female: 6.

## 5.2 The association between the perceived risk of cannabis use and cannabis use after controlling for age and education among Swedish youth

When age and education were controlled for, perceived risk had a statistically significant association with cannabis use ( $p < 0.0005$ ). When the perceived risk of cannabis use was medium among Swedish youth, the odds for cannabis use were lower ( $OR = 0.110$ ,  $p = 0.010$ ), compared to when there was no perceived risk. When the perceived risk of cannabis use was high among Swedish youth, the odds for cannabis use were lower ( $OR = 0.037$ ,  $p < 0.0005$ ), compared to when there was no perceived risk. Further, the variable gender was eliminated from the model because it was not a significant predictor ( $p = 0.402$ ; table 6).

Table 6: The final parsimonious model concerning the association between the perceived risk of cannabis use and cannabis use after controlling for age and education ( $n = 483$ ).

Variable	OR	95%CI	<i>p value</i>
<b>Perceived risk of Cannabis use</b>			
Perceived risk			$< 0.0005$
No Risk (Ref.)			
Low risk	0.429	0.073-2.526	0.350
Medium risk	0.110	0.020-0.596	0.010
High risk	0.037	0.007-0.194	$< 0.0005$
<b>Age</b>	1.179	1.026-1.354	0.020
<b>Education<sup>a</sup></b>	1.761	1.040-2.982	0.035
Yes			
No (Ref.)			

$R^2 = 0.234$  (Nagelkerke). Model  $\chi^2 (5) = 75.290$ ,  $p < 0.0005$ . Missing cases; 19. <sup>a</sup>Full-time studies.

## 5.3 The association between the perceived risk of cannabis use and cannabis use regarding Swedish male youth

Among male participants, when age and education were controlled for, perceived risk had a statistically significant association with cannabis use ( $p < 0.0005$ ). When the perceived risk of cannabis use was medium among Swedish male youth, the odds for cannabis use were lower ( $OR = 0.146$ ,  $p = 0.034$ ), compared to when there was no perceived risk. When the perceived risk of cannabis use was high among Swedish male youth, the odds for cannabis use were lower ( $OR = 0.045$ ,  $p = 0.001$ ), compared to when there was no perceived risk (table 7).

Table 7: Binary logistic regression analysis with respect to the association between the perceived risk of cannabis use and cannabis use after controlling for age and education among male participants (n=263).

Variable	OR	95%CI	p value
<b>Perceived risk of Cannabis use</b>			
Perceived risk			<0.0005
No Risk (Ref.)			
Low risk	0.406	0.064-2.573	0.339
Medium risk	0.146	0.025-0.868	0.034
High risk	0.045	0.008-0.267	0.001
<b>Age</b>	1.217	1.019-1.454	0.031
<b>Education<sup>a</sup></b>	2.050	1.045-4.020	0.037
Yes			
No (Ref.)			

R<sup>2</sup>=0.246(Nagelkerke). Model  $\chi^2(5) = 47.210$ ,  $p < 0.0005$ . Missing cases; male: 13. <sup>a</sup>Full-time studies.

## 6 DISCUSSION

### 6.1 Summary

→ The thesis project focused on exploring the relationship between the perceived risk of cannabis use and cannabis use among Swedish youth after accounting for the sociodemographic-related factors gender, age, and education. The thesis project also focused on highlighting whether the relation between the perceived risk of cannabis use and cannabis use was different according to male and female participants.

→ The result showed that when age and education were accounted for, the perceived risk had an association with cannabis use. When the perceived risk of cannabis use was medium or high among Swedish youth in general and male participants in particular, the odds for cannabis use were lower in both cases, compared to when there was no perceived risk.

## **6.2 Method discussion**

### **6.2.1 Methodological approach and study design**

When a quantitative methodological approach is chosen, it is possible to study associations as well as take upon an objective stance as a researcher (Bryman, 2016). The thesis project was quantitative since the overall aim was to study the association between the perceived risk of cannabis use and cannabis use among Swedish youth. An objective stance was taken by the author, since the author aimed at putting her own beliefs and understandings aside during the thesis project.

It would also be of interest to study youths' thoughts and perspectives about how the perceived risk of cannabis use relates to cannabis use. By studying that, an in-depth understanding could emerge regarding how their risk perceptions impact behaviours. What could be clarified is, why a higher risk perception leads to not using cannabis since the overall result indicated that. However, clarifying the nature of the association between the perceived risk of cannabis use and cannabis use was in focus, hence a quantitative study was needed rather than a qualitative study.

The research design that was implemented represented a cross-sectional design (Europäische Kommission, 2012). A disadvantage that follows due to that is that a causal direction cannot be clarified (Merrill, 2013). Therefore, if the perceived risk of cannabis use affects cannabis use, or if cannabis use affects the perceived risk was highly unclear. Consequently, there was a limited understanding of the phenomenon. By, for example, choosing a longitudinal research design, the causal direction could be highlighted.

### **6.2.2 Sample**

The sampling method that was chosen for Flash Eurobarometer 330 was probability sampling (Europäische Kommission, 2012). Even though no clear statement was given concerning which probability sampling method that was chosen, the choice of a probability sampling method could be argued as more beneficial than, for example, a snowball sampling method. By choosing a probability sampling method, Bryman (2016) describes that each study participant in relation to another study participant has an equal chance of being chosen. Consequently, in most cases providing a representative sample, thus strengthening the opportunity to generalize findings (Bryman, 2016). If a snowball sampling method would have been chosen, then, for example, some study participants would have had a higher chance of being selected in comparison to other study participants. The problem with this method would have been that these individuals would have certain characteristics that would probably poorly represented the actual study population. This, in turn, would make it difficult to understand the phenomenon from its true light.

### **6.2.3 Data collection: collection of data, questionnaire, variables, and processing of the data**

The data was collected through conducting telephone interviews (Europäische Kommission, 2012). Block and Erskine (2012) mentioned that when conducting telephone interviews with study participants there are some advantages (Block & Erskine, 2012). The sample size of the Flash Eurobarometer 330 study was 12313 (Europäische Kommission, 2012), and the sample size for Sweden was 502. These sample sizes could be argued as high and possible to reach quickly due to the choice of conducting telephone interviews with youth. Block and Erskine (2012) also describe that when conducting telephone interviews there are some disadvantages (Block & Erskine, 2012). Concerning the present thesis project, there was uncertainty about whether the responses given by youths would have been the same if the questionnaire was filled in in person. Further, to conduct interviews may pose a risk to desirability bias. The responses given by the youth may have been in line with how they should answer the questions. Some may have reported that they did perceive cannabis use as a substance that posed a risk to a person's health, when in fact they may not have agreed with that. Others may have reported that they did not use cannabis, when in fact they may have used the substance. If this response bias did occur, then the understanding of the associations between the perceived risk of cannabis use and cannabis use would be misleading. Those aspects could be thought of as something difficult to control. Further, the extent of the external missing data was unclear. If the external missing data was high, then those who participated may have differentiated from those who did not participate. Ultimately, that would have captured a certain rather than a proper understanding of the attitudes on drugs among Swedish youth.

The questionnaire gives a reader the impression of consisting of concrete and straightforward questions that focused on youths' attitudes on drugs (Appendix A). The thoroughly formulated survey questions can be considered a strength. Additionally, the chosen demographic-related questions focused on gender, age, and education (full-time studies). When the interviewers interviewed the study participants, the interviewers filled in whether the participant was a male or female (Gallup Organization, 2011). This could be considered a weakness, because assuming that someone was a male or female based on the voice heard may not be as a good assessment as asking the study participant whether the person was a male or female. Regarding gender, a third answer alternative was absent, that is, "other". That could be considered a weakness, since there was an exclusion of those individuals from start. The other demographic-related questions chosen were measured appropriately.

From the questionnaire, two main questions were chosen. The first chosen question was: "To what extent do you think the following substances may pose a risk to a person's health (use cannabis regularly)?" The second main chosen question was: "Have you used cannabis yourself?" (Gallup Organization, 2011). During the thesis project, the author emailed the responsible publishers for the survey to understand how those questions related to quality criteria. However, no response was given. Therefore, there was an uncertainty about how well the questions measured what they intended to measure. It would have been of particular value to know whether the question concerning risk perception measured what it intended to,



that is, to what extent it related to the quality aspect validity. That was because risk could be argued as a more complex phenomenon to measure than the use of cannabis.

The present thesis project focused on the association between the perceived risk of cannabis use and cannabis use. Perceived risk of cannabis use regarded the risk perception of using cannabis regularly. The reason for choosing that aspect rather than the aspect of using cannabis once or twice was because the former could be argued as more problematic. Volkow et al. (2014) describe that those individuals that choose to use marijuana for a long period or are heavy users in most cases negatively impact their brain development as well as are at risk of becoming addicted to the drug (Volkow et al., 2014).

Furthermore, gender, age, and education (full-time studies) served as potential confounding variables regarding the association between the perceived risk of cannabis use and cannabis use among Swedish youth. A limitation was that only these three variables were chosen as potential confounding variables. The questionnaire consisted of a variety of other demographic-related factors, such as the highest completed level of full-time education, occupation, professional position, and type of community (Europäische Kommission, 2012). However, choosing to control for some rather than all made it still possible to rule out the potential unique effect caused by some factors in regard to the association. Further, whether the association between the perceived risk of cannabis use and cannabis use differed according to gender among Swedish youth was in focus. In this case, choosing to study differences concerning gender and not in respect to age and education could be argued as a weakness. That was because all of those three variables were in focus for the thesis project and not only gender. By highlighting whether the association between the perceived risk of cannabis use and cannabis use differed according to age and education as well, a more comprehensive understanding of the association could have been portrayed.

The data were processed in two ways. To ease the interpretation, the answer alternatives regarding the perceived risk were turned, hence recoded. The new answer alternatives ranged from “no risk”, “low risk”, “medium risk” to “high risk”. That was because a risk perception usually goes from no risk to high risk or low risk to high risk. Danseco et al. (1999) explain that the dimension of the perceived risk of marijuana severity has been studied concerning the characteristics of no danger to great danger, no risk to great risk, and no harm to very great harm (Danseco et al., 1999). That in turn, showed another perspective on the necessity of recoding the answer alternatives. To appropriately conduct relevant analyses, hence binary logistic regressions, the variable cannabis use was dichotomized. The new answer alternatives were “no” and “yes” to cannabis use. Field (2018) explains that binary logistic regression relies on having a binary dependent variable (Field, 2018). Therefore, dichotomization was needed.

#### **6.2.4 Methods of analysis**

By performing multiple descriptive analyses and a Chi-squared test, it was possible to describe the sample. However, because of the low frequency in some cells, it would have been more suitable to conduct the Fisher test than the Chi-squared test. If the Fisher test was conducted it would certainly describe gender in regard to the perceived risk of cannabis use

and cannabis use accurately. Therefore, a limitation was that it was unclear whether the result for the Chi-squared test would have been similar or different to a result provided by the Fisher test. If the result would have been different, then how gender relates to the perceived risk of cannabis use and cannabis use was incorrectly described.

The first study question was: was there an association between the perceived risk of cannabis use and cannabis use after controlling for gender, age, and education among Swedish youth?. The study question was investigated by conducting a binary logistic regression. The purpose was to predict membership to either not using or using cannabis while accounting for categorical predictors (gender, full-time studies) and a continuous predictor (age). A strength was that the most parsimonious model was the final model presented. According to Field (2018) that is at times done when performing logistic regressions (Field, 2018). The benefit with that was that the final model highlighted actual and not theoretically probable predictors. Therefore, the demographic-related predictors' age and education were kept in the final model and not gender.

The second study question was: was the association between the perceived risk of cannabis use and cannabis use different according to gender among Swedish youth?. The study question was also studied by performing a binary logistic regression. The intention was to predict membership to either not using or using cannabis with respect to the perceived risk of cannabis use among males and females. When performing the binary logistic regression, significant predictors from the previous logistic regression were included in the model. A strength with that was that it was possible to rule out the unique effect of those variables in regard to the association. Further, the model would not work for female participants. This would have, for example, been caused by the fact that there were no cases concerning the two lowest risk perceptions with respect to not using cannabis, and only a few cases in the two lowest risk perceptions and using cannabis (table 5).

Field (2018) mentions that logistic regression relies on the assumption's binary outcome, linearity, independence of errors, absence of outliers in the solution, and absence of multicollinearity (Field, 2018). A binary dependent variable was used when the binary logistic regressions were conducted, hence the processed variable cannabis use was used. The remaining assumptions were not checked. The weakness with that was that whether the models were adequate enough in representing valid results were unknown. Therefore, the understandings of the associations between the perceived risk of cannabis use and cannabis use among Swedish youth should be understood with caution.

### **6.2.5 Research ethics**

The confidentiality requirement and the utilization requirement were in a broad sense applied to not expose the study participants to unauthorized persons. The importance of that was that it would not alter an individual's future willingness to take part in research. When researching in Sweden, the information requirement and the consent requirement are also considered (Vetenskapsrådet, 2002). However, those are to a higher extent performed while collecting data, which the author did not do in this case.

Studying the association between the perceived risk of cannabis use and cannabis use among Swedish youth could be viewed as a sensitive research topic. The topic could especially be viewed as sensitive due to studying youth's use of cannabis. However, when the question concerning cannabis use was asked, there was an answer alternative that followed: "You don't want to answer" (Appendix A; Gallup Organization, 2011). The possibility to choose that answer alternative may have given the impression that the desire was not to force the participants to answer if they did not want to. By conducting telephone interviews, participants could also answer all the questions about their attitudes on drugs without being seen by the interviewer. This may have hindered them from feeling exposed when sharing their specific answers.

## **6.3 Result discussion**

### ***6.3.1 The association between the perceived risk of cannabis use and cannabis use after controlling for age and education among Swedish youth***

When age and education were accounted for, the perceived risk had a relation to cannabis use. When the perceived risk of cannabis use was medium or high among Swedish youth, the odds for cannabis use decreased. Generally, research shows that persons that perceive a substance as risky often take those substances to a lower degree (Vuolo, 2012). In particular, a greater risk of marijuana use was related to less use among adolescents and young adults entering college in the US (Bachman et al., 1998; Johnston et al., 2005; Kilmer et al., 2007). The results from the thesis project a line with that, which firstly shows that this association may not be common for certain youth, instead it shows that it may be common for youth from different countries. This in turn meant that the results oppose the second understanding of the association between risk perception and use of drugs. That understanding was that a higher perception of drug use-related risk was related to higher use (Gerrard et al., 1996; Sjöberg, 1998). That then clarifies how the association between the risk of cannabis use and use may differ from the association between drug use-related risk and use. This could be due to the differences between how individuals perceive illegal drugs and drugs.

Karlsson et al. (2019) describe that a cultural acceptance of illicit drugs such as cannabis exist among some youth (Karlsson et al., 2019). A trend that does not seem to appear among Swedish youth that participated in the study, since the association was that when the risk perception increased, the use of cannabis decreased. Further, research among Swedish youth showed that low-risk perceptions increased the risk of using cannabis (Karlsson et al., 2018). A research finding that broadens the understanding of how a low risk perception relates to cannabis use among a similar sample as the sample in focus. A result that indicates a relation between having a medium or high-risk perception, of the risk that cannabis may pose, and a decreased use of cannabis is significant in many ways. Some consequences could occur if a person chooses to use cannabis. Volkow et al. (2014), for example, describe that persons that

use marijuana during a short period have a risk of weakening their motor coordination, judgment, and short-term memory (Volkow et al., 2014).

There may be multiple reasons for the associations that were shown in this case. It is known that, for example, youth that has parents or friends that disapprove of drugs to a lower degree uses drugs (Dansecco et al., 1999). However, whether there was an association between parental disapproval and cannabis use or peer disapproval and cannabis use was not in focus for the thesis project. Further, a direct reason for the association between the perceived risk of cannabis use and cannabis use among Swedish youth was identified. It appears that having a medium or high-risk perception of cannabis use did impact the use of cannabis. This association could explicitly be explained with the help of the health belief model. By more directly applying the concept of perceived susceptibility/personal risk to the result findings, the relation between the existing risk perceptions and the behaviour, hence cannabis use, could be understood. The health belief model highlights that when a person believes that he or she is at risk, the person often acts in a preventive manner (Hayden, 2019). By applying that theoretical thinking of risk perception and behaviour to the association revealed, shows that the belief that cannabis poses a risk to a person's health influences a behaviour where youth more often chooses not to use cannabis. Therefore, having a medium or high-risk perception of the health risk that cannabis may pose serves as a protective factor against choosing a harmful behaviour, namely, using cannabis.

### ***6.3.2 The association between the perceived risk of cannabis use and cannabis use regarding male and female Swedish youth***

Among males, when age and education were accounted for, the perceived risk had a relation to cannabis use. When the perceived risk of cannabis use was medium or high among male youth, the odds for cannabis use decreased. A conclusion was that the result for males was similar to what was seen in the whole data. Meaning that among male youth as well, having a medium or high-risk perception of the health risk that cannabis may pose serves as a protective factor against choosing a harmful behaviour, that is, using cannabis. However, regarding female participants the association between the perceived risk of cannabis use and cannabis use was unknown, that is, there was uncertainty about whether the association would have been similar or different. However, research shows that girls perceive marijuana as risky to a higher extent than boys (Terry-McElrath et al., 2017). Research also shows that there is a difference between the prevalence of girl's and boy's substance use since boys consume substances to a higher degree (Kážmér et al., 2019). In the present thesis project, it was shown that among female participants, the higher the risk perception of cannabis use, the lower the use of cannabis. That showed to some extent how the perceived risk of cannabis use related to cannabis use among female participants. However, the association between the perceived risk of cannabis use and cannabis use after controlling for age and education among Swedish female youth should be investigated more exactly. That is because Lopez-Quintero and Neumark (2009) describe that the association between perceived risk and substance use is complex, both in regard to its directionally and to its temporality (Lopez-Quintero & Neumark, 2009).

Further, the health belief model demonstrates that motivating/modifying factors, among other things, impact the main concepts such as perceived susceptibility/personal risk, which then impact behaviour (Hayden, 2019). However, when age and full-time studies were controlled for, Swedish youth in general and among male youth in particular, the association between the perceived risk of cannabis use and cannabis use remained. Meaning that, ruling out the unique effect of those predictors does not interfere with the association between the perceived risk of cannabis use and cannabis use among Swedish youth, thus capturing its existing relation. In summary, it is of importance to point out that the health belief model consists of more concepts than perceived susceptibility/personal risk. Firstly, there are other main concepts such as, for example, perceived seriousness, perceived benefits, and perceived barriers. Secondly, other additional concepts affect the main concepts which are a cue to action and self-efficacy (Hayden, 2019). Therefore, there is the likelihood that these to some extent impact male and female Swedish youths' use of cannabis as well.

## **6.4 Public health relevance**

Public health is a scientific area that focuses on enabling an equitable distribution of health within and between groups in a society. The desire is to promote and protect the health status (Binns & Low, 2015). The thesis project revealed that among Swedish youth, higher risk perception, of the risk that cannabis pose to a person's health, entailed a lower use of cannabis. Results that are relevant from a public health perspective since it points to the fact that risk perception did serve as a protective factor against cannabis use. By knowing that, it was revealed how relevant future public health interventions can be developed, that is, they should for example focus on risk perception. By implementing public health interventions that focus on preserving their risk perception, there may be a possibility to influence a behaviour where youth continues to refrain from using cannabis. In contrast, Hawke et al. (2018) mention that, some Canadian youth voice a quite alarming understanding of cannabis and its potential consequences by using the substance. Focus group discussions with youth revealed that numerous stated that the substance is non-addictive, safe, and natural. Focus group discussions with youth also revealed that numerous stated that they were indifferent, unaware, or unsure about the substance impact (Hawke et al., 2018). To prevent a future risk perception that a line with some Canadian youths' risk perception, preserving Swedish youths' risk perception is of value. Further, Kázmér et al. (2019), for example, describe that an individual is at risk for mental and physical health-related implications when using cannabis early in life (Kázmér et al., 2019). To therefore implement public health interventions are of importance since health-related implications can be prevented, thus protecting their health status from future harm.

## **6.5 Suggestions for further research**

The thesis project investigated the relationship between the perceived risk of cannabis use and cannabis use among Swedish youth. For future research, it would be of interest to

explore reasons for the medium and high-risk perception regarding cannabis, as well as reasons for choosing to refrain from cannabis. By conducting qualitative based studies that focus on those two perspectives, there is an opportunity to in-depth understand the relation between the perceived risk of cannabis use and cannabis use.

The Flash Eurobarometer 330 - Youth Attitudes on Drugs, was based on 27 European countries (Europäische Kommission, 2012). There is a possibility to study the association between the perceived risk of cannabis use and cannabis use among European youth. The present understanding is that the data has not been used for that specific purpose. The relevance of that would be that a country-level specific understanding of the association could be highlighted. By studying the association in several countries and comparing them, it would, for example, show whether there are countries where a low-risk perception of cannabis use relates to high use of cannabis. A relation that is particularly alarming from a public health perspective and would, among other things, hinder an equal distribution of health among European youth.

## **7 CONCLUSIONS**

Among Swedish youth in general and among Swedish male youth in particular, the existing risk perception of the health risk that cannabis may pose serves as a protective factor against choosing a harmful behaviour, that is, using cannabis. The benefit with having a relatively good risk perception of the health risk that cannabis may pose are multiple. Firstly, their risk perceptions may protect them from the harm that cannabis use would cause to their life. Secondly, their risk perceptions may protect them from the harm that cannabis use would cause to their health. By therefore preserving the risk perception that Swedish youth have of cannabis, there is a possibility to help them live a well-functioned life. To therefore develop and implement public health interventions that aim at preserving their risk perception of cannabis is essential.

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# APPENDIX A; QUESTIONNAIRE - FLASH EUROBAROMETER

## 330

### EUROBAROMETER 2011

#### Youth attitudes on drugs

D1. Gender

[DO NOT ASK - MARK APPROPRIATE]

- Male ..... 1
- Female ..... 2

D2. How old are you?

- [ ] [ ] years old
- [REFUSAL/NO ANSWER] ..... 00

D3\_a. What is the last level of full time education that you completed?

- Primary education ..... 1
- Secondary education ..... 2
- Higher education ..... 3
- [NEVER BEEN IN FULL TIME EDUCATION] ..... 4
- [DK/NA] ..... 9

D3\_b. Are you currently a full time student?

- Yes ..... 1 ASK D4A
- No ..... 2 ASK D4B
- [DK/NA] ..... 9 ASK D4B

D4A. What is the current occupation of the person who contributes most to the household income ?  
Would you say he/she is self-employed, an employee, a manual worker or would you say that he/she is without a professional activity? Does it mean that he/she is a(n)...

[IF A RESPONSE TO THE MAIN CATEGORY IS GIVEN, READ OUT THE RESPECTIVE SUB-CATEGORIES]

#### - Self-employed

- i.e. : - farmer, forester, fisherman ..... 11
- owner of a shop, craftsman ..... 12
- professional (lawyer, medical practitioner, accountant, architect,...) ..... 13
- manager of a company ..... 14
- other ..... 15

#### - Employee

- i.e. : - professional (employed doctor, lawyer, accountant, architect) ..... 21
- general management, director or top management ..... 22

- middle management .....	23
- Civil servant.....	24
- office clerk.....	25
- other employee (salesman, nurse, etc...) .....	26
- other .....	27
<b>- Manual worker</b>	
→ i.e. : - supervisor / foreman (team manager, etc...) .....	31
- Manual worker .....	32
- unskilled manual worker .....	33
- other .....	34
<b>- Without a professional activity</b>	
→ i.e. : - looking after the home.....	41
- student (full time).....	42
- retired .....	43
- seeking a job .....	44
- other .....	45
- [Refusal] .....	99

**D4B.** As far as your current occupation is concerned, would you say you are self-employed, an employee, a manual worker or would you say that you are without a professional activity? Does it mean that you are a(n)...

[IF A RESPONSE TO THE MAIN CATEGORY IS GIVEN, READ OUT THE RESPECTIVE SUB-CATEGORIES]

**- Self-employed**

→ i.e. : - farmer, forester, fisherman.....	11
- owner of a shop, craftsman .....	12
- professional (lawyer, medical practitioner, accountant, architect,...) .....	13
- manager of a company.....	14
- other .....	15

**- Employee**

→ i.e. : - professional (employed doctor, lawyer, accountant, architect).....	21
- general management, director or top management .....	22
- middle management .....	23
- Civil servant.....	24
- office clerk.....	25
- other employee (salesman, nurse, etc...) .....	26
- other .....	27

**- Manual worker**

→ i.e. : - supervisor / foreman (team manager, etc...) .....	31
- Manual worker .....	32
- unskilled manual worker .....	33
- other .....	34

- Without a professional activity

→ i.e. :	- looking after the home.....	41
	- student (full time).....	42
	- retired .....	43
	- seeking a job .....	44
	- other .....	45
	- [Refusal].....	99

D6. Would you say you live in a ...?

- metropolitan zone .....	1
- other town/urban centre .....	2
- rural zone.....	3
- [Refusal].....	9

Q1. If you wanted to have information about illicit drugs and drug use in general, who would you turn to? Please choose up to three.

[READ OUT - ROTATE - RECORD THREE ANSWERS]

- A friend .....	01
- Parents/ relatives.....	02
- Someone at school or at work.....	03
- A doctor, a nurse or another health professional .....	04
- A social/ youth worker .....	05
- A specialised drug counsellor/ centre .....	06
- The police .....	07
- A telephone helpline .....	08
- The internet (websites or chats).....	09
- Mass media (newspapers, magazines, TV, radio).....	10
- [Others] .....	11
- [Does not want to have more info] .....	12
- [It depends] .....	13
- [None of these] .....	14
- [DK/NA] .....	99

Q2. Through which channels – if any - have you been informed over the past year about the effects and risks of the use of illicit drugs? Please choose up to three.

[READ OUT- ROTATE- RECORD THREE ANSWERS]

- Through a school prevention programme.....	01
- From friends .....	02

- From parents/ relatives .....	03
- Through media campaign(s) .....	04
- From the police.....	05
- Found it on the internet (websites or chats).....	06
- From a drug and/or alcohol telephone helpline .....	07
- [I have not been informed at all] .....	08
- [Other] .....	09
- [DK/NA] .....	99

**Q3. What do you think are the three most effective ways for public authorities to reduce drugs problems?**

[READ OUT- ROTATE- RECORD THREE ANSWERS]

- Information and prevention campaigns .....	1
- Treatment and rehabilitation of drug users .....	2
- Tough measures against drug dealers and traffickers.....	3
- Making drugs legal.....	4
- Reduction of poverty/ unemployment.....	5
- Tough measures against drug users .....	6
- More leisure opportunities.....	7
- [DK/NA].....	9

**Q4. To what extent do you think the following substances may pose a risk to a person's health?**

[READ OUT- ONE ANSWER PER LINE]

- High risk .....	1
- Medium risk .....	2
- Low risk.....	3
- No risk .....	4
- [DK/NA] .....	9

A. Use cannabis once or twice .....	1 2 3 4 5 9
B. Use cannabis regularly .....	1 2 3 4 5 9
C. Use ecstasy once or twice .....	1 2 3 4 5 9
D. Use ecstasy regularly .....	1 2 3 4 5 9
E. Drink alcohol once or twice .....	1 2 3 4 5 9
F. Drink alcohol regularly.....	1 2 3 4 5 9
G. Use cocaine once or twice .....	1 2 3 4 5 9
H. Use cocaine regularly.....	1 2 3 4 5 9



**Q5. In certain countries some new substances that imitate the effects of illicit drugs are being sold as legal substances in the form of – for example - powders, tablets/pills or herbs. Have you ever used such substances?**

- No, I never used such substances ..... 1 → go to Q7
- Yes, I have used such substances ..... 2
- [DK/NA] ..... 9 → go to Q7

**Q6. Where were you offered such substances?**

[READ OUT- SEVERAL ANSWERS POSSIBLE]

- I was offered such substances by a friend..... 1
- I bought such substances in a specialised shop..... 2
- I was offered such substances during a party or in a club ..... 3
- I bought such substances over the internet..... 4
- [Other] ..... 5
- [DK/NA] ..... 9

**Q7. The sale of drugs such as cannabis, cocaine, ecstasy and heroin is officially banned in all EU Member States. The sale of legal substances such as alcohol and tobacco is not prohibited but is regulated in all EU countries. Do you think the following substances should (continue to) be banned or should they be regulated?**

*Examples of regulation are: minimum age limits for buying, limits in the concentration of active components such as nicotine, licensed sales through specialised shops and pharmacies.*

[READ OUT- ONE ANSWER PER LINE]

- Should (Continue to) be banned ..... 1
- Should be regulated ..... 2
- [Should be available without restrictions] ..... 3
- [Other] ..... 4
- [DK/NA] ..... 9

- A. Cannabis ..... 1 2 3 4 9
- B. Tobacco ..... 1 2 3 4 9
- C. Ecstasy ..... 1 2 3 4 9
- D. Heroin ..... 1 2 3 4 9
- E. Alcohol ..... 1 2 3 4 9
- F. Cocaine ..... 1 2 3 4 9

**Q8. What would be an appropriate way to handle new substances that imitate the effects of illicit drugs and that are sold as legal substances?**

[READ OUT- ONLY ONE ANSWER POSSIBLE]

- Regulate..... 1
- Ban them only if they pose a risk to health..... 2
- Ban them under any circumstance..... 3
- Do nothing..... 4
- [Other] ..... 5
- [DK/NA]..... 9

**Q9. How difficult or easy do you think it would be for you personally to obtain the following substances within 24 hours if you wanted some?**

[READ OUT- ONE ANSWER PER LINE]

- Impossible..... 1
- Very difficult ..... 2
- Fairly difficult ..... 3
- Fairly easy ..... 4
- Very easy ..... 5
- [DK/NA]..... 9

- A. Cannabis.....1 2 3 4 5
- B. Alcohol.....1 2 3 4 5
- C. Cocaine.....1 2 3 4 5
- D. Ecstasy.....1 2 3 4 5
- E. Tobacco.....1 2 3 4 5
- F. Heroin.....1 2 3 4 5

**Q10. Have you used cannabis yourself?**

[READ OUT 1 TO 5 - ONLY ONE ANSWER POSSIBLE]

- No, I have never used ..... 1
- Yes, in the last 30 days..... 2
- Yes, in the last 12 months..... 3
- Yes, but more than 12 months ago ..... 4
- You don't want to answer ..... 5
- [Don't know] ..... 9



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