

SECTION 5 – GENERAL DISCUSSION AND CONCLUSIONS

CHAPTER 11 – General discussion

What is at stake?

Teenagers are a crucial group to study when investigating risky behaviors because adolescence is a key period of initiation. Cannabis use and binge drinking, moreover, have important consequences for brain development, which is still ongoing in this age group. Finally, because it is a determinant of later socioeconomic status and is related to mortality risk (people with low levels of education die younger than more educated people) and due to its association with substance use, poor school performance in high school should also be considered a risky behavior (see Chapter 1).

Traditionally, the prevalence of these risky behaviors was higher among boys than among girls. In recent decades, however, those gender gaps have decreased (see Chapter 1). For example, in terms of tobacco consumption, in some European countries, girls even smoke more than boys do (Inchley J., 2016). This narrowing gender gap will eventually lower women's life expectancy at birth and hinder their advance in education: two of the (rare) advantages women have over men (collaborators, 2017). The evolution in the gender gap in risky behaviors coincides with the mixing of boys and girls at school. That was the motivation for investigating how gender relationships influence risky behaviors during adolescence, the subject of this PhD thesis.

Drawing on gender socialization theories and socio-cognitive models explaining the adoption of behaviors, our introduction identified several areas that we wanted to address by posing different research questions. In the next few paragraphs, we will return to those questions and consider how the previous chapters have contributed to answering them by summarizing the main related findings.

Research questions and main findings: summary

Our first question was about gender mixing at school and its effects on risky behavior: **has gender-mixing at school influenced the adoption of risky behaviors among high school students?** To answer that question, we analyzed adolescent gender relationships and their association with four risky behaviors: smoking, binge drinking, cannabis use (Chapter 6, Section 2), and low levels of school performance (Chapter 7, Section 2). In the second section of this thesis, we addressed the first research question specifically: **do relationships with the other gender influence the adoption of risky behaviors among adolescents?** In particular, we investigated (1) whether levels of risky behaviors tend to be higher (higher levels of smoking, binge drinking, and cannabis use and lower school performance levels) among girls with majority-male friends than among girls with majority-female friends. The answer to this (sub-)question is yes: among girls with other-sex friendships, levels of smoking, binge drinking, and cannabis use were higher and school performance levels were lower than among girls with same-sex friendships.

Because we wanted to maintain a gender perspective, however, we also investigated (2) whether levels of risky behaviors tend to be lower (lower levels of smoking, binge drinking, and cannabis use and higher school performance levels) among boys with majority-female friends than among boys with majority-male friends? The answer to this question was more nuanced and depended on the behavior being considered. Levels of tobacco use were higher among boys in other-sex friendships and school performance levels were (slightly) higher. The prevalence of binge drinking and cannabis use, however, were higher among boys with majority-male friends. The answer to the first question, therefore, depends on the behavior. The gender context of the school should, however, also be taken into account. Male-majority schools displayed a higher prevalence of all risky behaviors among both boys and

girls, compared to students in majority-female or gender-balanced schools. **To analyze these results, in the next section, we will further discuss gender socialization and its effects on gender relationships and gender norms regarding risky behaviors.**

In the introduction, in addition to gender socialization theory, we presented two leading theories explaining the adoption of behaviors from current literature: the Theory of Planned Behavior (TPB) and the Prototype-Willingness Model (PMW) (see Chapter 3). The analysis of socio-cognitive theories in Chapter 3 raised questions that we addressed in the third section of this thesis (Chapter 8 and Chapter 9, Section 3).

Firstly, both the PWM and the TPB underline the importance of the impact of norms and beliefs regarding a behavior on the intention to adopt that behavior (Conner M., 2005b). Regarding smoking, however, several studies have addressed smoking beliefs that were not comparable. In Chapter 8, we therefore **developed a comprehensive, systematic but easy-to-use typology of beliefs, and systematically analyzed gender differences in smoking beliefs.** This typology of beliefs centered on two dimensions: (1) does the belief concern positive or negative aspects of smoking, and (2) does the belief concern individual or social aspects of tobacco consumption? The analysis of gender differences in these categories revealed that one in two beliefs differed significantly between genders, though the differences were small. Nonetheless, we were able to conclude that girls scored higher on negative social beliefs, while boys were more sensitive to the romantic aspects of smoking beliefs, which are mostly in the category of positive social beliefs.

Furthermore, an in-depth look at the association between gender and beliefs requires another dimension to be taken into account: the country. In the first chapter of the introduction, we acknowledged that gender trends in smoking differed between European regions. We hypothesized, therefore, that gender differences in smoking beliefs would differ depending on the gender culture of a country. This last hypothesis, however, was not borne out by the evidence. Even though large differences were observed between countries, they

were not attributable to the gender index of inequalities, the measure we used to approximate the gender culture.

Aside from the importance of beliefs, the most important information that the PWM introduces is about the role of prototypes in the adoption of a behavior (Gerrard, 2002; A. Ravis et al., 2006). According to this concept, an adolescent is more likely to endorse a risky behavior if a prototype which is both likable and similar to him/her endorses this behavior. To the best of our knowledge, however, the current literature has failed to answer two questions regarding these prototypes.

Firstly, **no study has addressed the social distance from prototypes.** Adolescents are members of different peer groups, which can be described as social layers (schoolmates, acquaintances, and best friends). In Chapter 9, we answered the following research question: **which of these social layers has the greatest influence on an adolescent?** We found that the most proximate reference peer group (the clique) had the most influence on adolescents. Moreover, we found that reciprocity of friendship had an impact on belief sharing: the higher the prevalence of friendship ties that were reciprocated, the more an individual believed in negative social aspects of smoking, which shows that strong friendship ties may have a protective effect on adolescent health. **The implications of these findings for smoking interventions at school will be discussed further below.**

Secondly, **no study has shown how the similarity components of smoking prototypes should be measured.** In Chapter 9, we tested different similarity variables: gender, socioeconomic status, and smoking status. We found that the main determinant of similarity in beliefs is similarity in smoking status, but gender similarity (same-sex friendship) is also important in explaining girls' smoking beliefs. **These findings, which relate to gender similarity and its relationship with gender socialization, but also to the role of smoking status and gender similarity in conceptualizing smoking interventions, will be discussed later.**

In Chapter 9, we considered smoking beliefs as an outcome. Smoking beliefs are, indeed, core messages of smoking prevention programs and are associated with smoking (H.-P. Cremers et al., 2015; Sarah Grogan et al., 2009), a finding that was confirmed by our analysis. But our study went further: having considered negative social beliefs as an outcome, we were able to conclude that half of the variance in these beliefs was explained by peer group membership, which underlined the fact that negative social beliefs constitute a group norm in adolescent peer groups. **We will, therefore, spend some time discussing peer group norms below.**

Until now, we have outlined our findings regarding gender differences in smoking beliefs and peer group relationships, two factors that should be taken into account in tailoring smoking interventions at school (see below). Finding effective ways of addressing adolescent smoking across genders is one of the main deliverables of this PhD. School tobacco policies are the preferred tool for tackling this behavior.

In the fourth section of our thesis, we therefore analyzed, following the Silne R project rationales, whether adolescent smoking depended on the School Tobacco Policy (STP). As underlined in the first chapter, gender gaps in smoking are decreasing among European adolescents. In Chapter 10, we analyzed whether this reduction might be attributable to a gender-differential response to STPs which meant that girls were less sensitive to STPs than boys. This hypothesis, however, was not confirmed. Our study found, on the contrary, that STPs had an even greater effect in reducing smoking among girls than among boys.

Following the literature, we also **investigated the four mechanisms that were expected to mediate the relationship between STP scores and smoking at school: fear of sanction, peer pressure, negative beliefs about smoking, and control over the decision not to smoke, to see whether genders are differentially influenced by those mechanisms.** We found that the impact of the mechanisms on smoking reduction did not differ between genders. Peer pressure to smoke tends to limit the effect of STPs (high levels

of peer pressure were associated with more smoking on school premises), while having negative social beliefs increased the influence of STPs in limiting smoking on school premises. We also found, however, that girls, not boys, were influenced by the third mechanism: STPs influence smoking among girls by increasing their control over the decision not to smoke. **The implications of these findings regarding STPs and the mechanisms involved in them will be discussed further below.**

Having briefly reviewed our research questions and findings, we will now focus on some of the aspects that were mentioned previously which require more in-depth analysis. Our discussion will be divided into two steps. First, we will discuss **how gender socialization affects risky behaviors**. To do so, we will consider four sub-questions: Do boys and girls differ in risky behavior prevalence? Do boys and girls differ in their beliefs and norms relating to smoking? Do boys and girls differ in their reactions to School Tobacco Policies? Do boys and girls differ in their relationships with peers? (Part 1). The answers to these questions will eventually help us to arrive at the other deliverable of this thesis, answering the following question: **How could smoking interventions be better tailored to take into account gender socialization, gender relationships, and gender context? (Part 2).**

Part 1: How can gender socialization help us to understand gender differences in (1) risky behavior prevalence and (2) the influence of other-/same-gender friends; (3) beliefs and norms relating to smoking, (4) peer relationships, and (5) reactions to School Tobacco Policies?

Do boys and girls differ in risky behavior prevalence?

Chapters 6 and 7 provided evidence that boys still tend to engage more in risky behavior than girls. The gender gap has, however, decreased sharply in recent decades and, in some

cases, no longer exists (Inchley J., 2016). Moreover, these results are likely to differ depending on the behaviors being considered, which we will, as already mentioned in the introduction, demonstrate using a scale ranging from the most risky to the least risky behavior.

Cannabis use can be considered the most socially risky of all the behaviors analyzed here: cannabis use is illegal for underage adolescents in all countries of the Silne R project. It is also the most marginalized by society. By smoking cannabis, adolescents not only risk their health, they also break the law and adopt a marginalized behavior. In Chapter 6, we saw that 19% of boys and 12% of girls had tried cannabis, a statistically significant difference. Gender socialization, which we introduced in Chapter 2, provides a possible explanation for why adolescent boys are more often cannabis users than girls. Traditionally, their gender socialization encourages them to be more open to risk-taking.

Binge drinking is also detrimental to adolescent health (e.g. brain development, risky sexual behavior, and injuries) and is thus considered a risky behavior (C. f. S. A. Treatment., 2009). Unlike cannabis, however, alcohol use is legal (even though it might not be legal in all Silne R countries for 14-16 year old adolescents) and more socially accepted (Déroff & Fillaut, 2015). Chapter 6 confirmed that this behavior was more common among boys than girls: 22.6% of boys and 16.2% of girls had drunk five alcoholic drinks on a least two occasions in the past 30 days: a significant difference.

When it came to regular smoking, however, rates among girls were slightly higher than those among boys (18.1% for girls and 17.7% for boys). Regular smoking, however, which is highly detrimental to one's health (see Chapter 1), is legal (for people aged 18 and even for 16-year-old adolescents in Belgium, at the time of data collection). So, at first glance, social acceptance of binge drinking and regular smoking seem quite similar. Gender socialization, however, may help us to understand why gender gaps in binge drinking are more significant than gender gaps in regular smoking. Firstly, binge drinking is more risky for girls than boys:

when intoxicated by alcohol, women are more likely to experience dangerous situations than boys (sexual assault, for example) (Déroff & Fillaut, 2015). During their socialization, girls learn that being drunk is very risky. Secondly, social acceptance of drinking is higher for boys than girls, while the social sanctions associated with smoking are less gender-based (Déroff & Fillaut, 2015; Hitchman S.C., 2011; Schane, Glantz, & Ling, 2009). Thirdly, unlike smoking, binge drinking changes one's behavior (disinhibition and loss of control), which can damage a girl's social image to a greater extent than a boy's (Déroff & Fillaut, 2015). Social image and appearance are more important in the socialization of girls than in the socialization of boys (Bereni L., 2012).

As far as substance use is concerned, it appears that the more (socially) risky a behavior is²⁴, the greater the gender gap will be. It is also interesting to note that cannabis and binge-drinking modify adolescent behavior far more than smoking. Being drunk or high often leads to disinhibition or loss of self-control, which is not experienced when smoking tobacco. The gender socialization of boys teaches them to be in control of their emotions (Chaplin, Cole, & Zahn-Waxler, 2005). Consuming these substances might be a means of expressing themselves, of letting go some of that control. Girls might have less need for that because their socialization allows them to express their feelings openly (Kring & Gordon, 1998). Cannabis and alcohol use might play a particular role for adolescent boys dealing with changes during puberty. Furthermore, tobacco is often depicted as a tool for dealing with stress and anxiety, a very common belief among adolescents (see below). This might also be one of the explanations for why smoking rates among girls are overtaking those among boys.

In addition to substance use, our study also considered having low school performance levels as a risky behavior, because it is a proxy of later socioeconomic status and is thus a

²⁴ Although the social riskiness of behaviors has not been measured in this study, it should be taken into account in future studies.

determinant of the social gradient in health outcomes (see Chapter 1). There is, moreover, frequently an association between substance use and low school performance levels (Robert et al., 2019). In Chapter 7, we confirmed some well-known results from educational surveys: girls performed significantly better than boys (2.4/4 for girls, 2.1/4 for boys). The gender socialization of girls encourages them, from a very early age, to embrace school-oriented behavior. Also, while being a high performer is permitted and encouraged for girls, it is more often discouraged and sanctioned in boys' peer groups (Bishop J.H., 2004).

As we saw in Chapter 2, the gender socialization of boys and girls influences the way adolescents consider and engage with risky behaviors. If the gender of adolescents is so influential, however, contact with adolescents from the other gender may initiate or reinforce beliefs and norms related to the behaviors. The next few paragraphs will address these issues.

How are boys' and girls' risky behaviors influenced by their relationships with the same/other gender?

In Chapters 6 and 7, we not only gave a description of gender differences in risky behaviors: we also looked at how relationships with the same or with the other gender might shape risky behaviors among adolescents. As gender socialization affects risky behaviors differently depending on the behavior (see above), we will continue to separate cannabis use and binge drinking among boys from the two other behaviors.

Not only were cannabis and binge drinking the two behaviors with the highest gender gaps, they were also the behaviors that were more frequent among males in same-sex friendships than those in other-sex friendships. Even though we could not confirm any causality between the two results (see limitations, below), we suggest that both these behaviors are strongly related to the gender socialization of boys (Déroff & Fillaut, 2015; Sauvadet,

2006b). By grouping together, boys may thus reinforce their tendency to use cannabis or to binge drink. Because of our study design, however, our results cannot confirm this assumption. Nonetheless, another important piece of literature may contribute to the explanatory framework of gender socialization.

The literature on peer effect has long recognized two concurrent mechanisms that explain why people group together according to similarity of behavior: peer selection and peer influence (Brian Borsari & Carey, 2001; K. Fujimoto & T. W. Valente, 2012; Go et al., 2010; Hruschka et al., 2011). According to the first concept, adolescent boys group together because they share a motivation to use substances (Go et al., 2010). They might, for instance, become friends at a party where cannabis or alcohol is used and bond over them. According to the second concept, friends influence each other to adopt behaviors. Recent literature has concluded that both mechanisms are involved (McMillan et al., 2018). However, the peer influence mechanism is worth looking at in depth. An adolescent who smokes cannabis or binge drinks can influence his friends via two types of norms: descriptive norms and injunctive norms. Descriptive norms occur when an adolescent sees one of his friends using a substance and considers it a normal behavior to adopt (Barman-Adhikari, Al Tayyib, Begun, Bowen, & Rice, 2017; Amanda Ravis & Sheeran, 2003). Injunctive norms concern the social messages surrounding a behavior, whether or not they are explicitly formulated (Etcheverry & Agnew, 2008). If an adolescent thinks that his/her friends find it cool to smoke cannabis or binge drink, he/she will be more likely to do so too, because he/she wants to fit in with that group. Adolescents have a particular need for membership and belonging to a peer group. Thus, whether via injunctive or descriptive norms, adolescents are influenced by their peers. As adolescent boys are particularly socialized to adopt these behaviors, boys who are friends with boys tend to adopt these behaviors even more than other boys.

The same is true for girls: whatever the substance, when girls are friends with boys, they always tend to use more substances than their female counterparts that have girl friends. This might be a consequence of the influence of male gender socialization promoting risky behaviors. Through injunction or description, boys will influence their female friends to endorse these behaviors. Another clue to this process is found in our study of the gender balance of schools. Whatever the risky behavior, both boys and girls tend to adopt more risky behaviors if they attend a school with a majority of boys. In such male-dominant contexts, boys are more able to spread their norms relating to risky behavior. We recommend further research to investigate gender norms and substance use across genders in more depth.

These normative explanations do not, however, explain why boys with other-sex friends tend to smoke more than boys with same-sex friends. Smoking also has to be considered carefully according to the statistics, girls smoke slightly more than boys, so the “normative” explanation would explain why boys with other-sex friends tend to smoke more than boys with same-sex friends²⁵. According to this explanation, however, we would have found that boys with other-sex friends who attended majority-female schools were at greater risk of smoking. Once again, however, majority-male environments were the most risky ones. Moreover, the normative explanation does not explain why girls with other-sex friends smoke more than girls with same-sex friends.

One hypothesis is that tobacco smoking is no longer gender-connoted and that gender socialization encourages both genders equally to adopt tobacco or has a neutral influence. Indeed, tobacco advertising has targeted both genders for decades, albeit with different messages, and our study of smoking beliefs showed that very few students (around 5-10%)

²⁵ A similar difference was found for low school performance: the two alternative theories presented hereafter might thus also apply to this behavior. Being a bad performer, in particular, might be a way to display a masculine attitude and/or to interact with the other gender (see discussion in Chapter 7).

thought that smoking helps you to look masculine or feminine (the two questions were asked separately). So, according to this hypothesis, unlike other risky behaviors, smoking would not be promoted more by either boys' or girls' gender socialization.

Another explanation, which does not preclude the previous one, is that smoking cigarettes plays a particular *relational* role in other-sex friendships. Smoking cigarettes may offer special occasions to interact with the other gender: asking for a cigarette or sitting down outdoors to smoke are good excuses to engage in conversation with someone an adolescent wants to be noticed by (Park, Behrman, & Choi, 2013; F. Poulin, Denault, & Pedersen, 2011). Cigarette smoking may thus be a key element of social transaction between adolescents. According to the social exchange theory, adolescents want to maximize their satisfaction (Cook, 2006). To do so, they will incur costs (such as smoking) because they will receive benefits that outweigh those costs (such as befriending someone they are interested in). Moreover, this theory emphasizes the opposition between short-term and long-term perspectives. Individuals tend to favor the short-term over the long-term. Among adolescents, the short-term benefits presented by the possibility of dating might easily outweigh the long-term risk of smoking to one's health (Cook, 2006).

Nonetheless, these explanations still don't explain the fact that both genders attending majority-male schools were particularly at risk of smoking cigarettes. The normative explanation should not be dismissed too quickly. Risky behaviors are particularly common in male-majority schools (see above). We should, however, also consider the sociodemographic characteristics of such schools that may contribute to this particular risk-oriented context, such as lower socioeconomic background and higher mean age of students, both of which are known determinants of smoking (Lorant et al., 2015). Compared to other types of school, male-majority schools were indeed attended by older students (15.4 years old in male-majority schools, 15.2 in female-majority schools, and 15.1 in gender-balanced schools. All differences between groups were significant ($p < 0.05$) and

less advantaged students (SES score: 6.5/10 in male-majority schools, 6.6/10 in female-majority schools, and 6.9/10 in gender-balanced schools, all differences between groups significant $p < 0.05$). Further studies might thus investigate the particular normative context of such schools by taking into account not only gender norms but also social class.

Whether they are strengthened by the gender and/or social context of schools or not, tobacco norms are, therefore, of particular interest. The third section of this thesis explored gender differences in smoking beliefs and their importance in adolescent peer groups. In the next few paragraphs, we will focus on the findings of this paper to see whether smoking beliefs can be considered a norm in peer groups and whether the sharing of norms differs between genders as a result of gender socialization.

Do boys and girls differ in their beliefs about smoking?

Chapter 8 explored a new typology of smoking beliefs based on two criteria: does this belief promote positive or negative aspects of smoking, and is this belief associated with the individual or his/her social life. Gender differences were found in those categories, but the differences were limited in size. Some of those gender differences, however, may be attributable to gender socialization.

In the first category (individual positive beliefs), following the literature, we expected girls to have higher belief scores than boys. This category contained the belief that “smoking helps you to lose weight or stay thin” and the gender socialization of girls promotes greater attention to body image (Calogero & Thompson, 2010). Indeed, for this statement, girls scored slightly higher than boys (21% of girls and 18% of boys agreed with this statement). The first category, however, contained another statement related to smoking helping you to feel relaxed. Because girls have a higher tendency to have mood-related problems during adolescence (Chaplin, Gillham, & Seligman, 2009), we expected girls to score higher, but

this was not true: both genders had similar scores for this belief. We were surprised that there was a limited gender gap in the first category of beliefs, because previous studies have found larger gender gaps in this category (ASPLPT, 2002; Hrubá D., 2010). We might thus postulate that the gender gap in positive individual beliefs is following a similar trend to the gender gap in smoking and is now decreasing.

The study of the second category (negative individual beliefs) was expected to show a greater proportion of agreement among girls than boys. Because the gender socialization of girls makes them more attentive to their body and social images, we expected girls to have more knowledge of the negative effects of tobacco on their health and bodies. This hypothesis was found to be true but the results should be considered in detail: girls scored higher for three out of four negative individual beliefs, but the gender gaps were small. The largest difference was found for “smoking causes facial wrinkles” (78% of girls agreed, compared to 70% of boys), a belief that is related to aesthetics, which the gender socialization of girls emphasizes as more of a concern than that of boys (Bereni L., 2012; Calogero & Thompson, 2010).

In the third category, positive social beliefs, the literature differed as to what to expect in terms of gender differences (see Chapter 8). There are two results, however, which are worth noting in relation to gender socialization. We asked, in two separate questions, whether “smoking helps you to look feminine” and whether “smoking helps you to look masculine.” Very few students agreed with these statements, though smoking was associated with masculinity more than twice as much as with femininity (4% for looking feminine and 10% for looking masculine). These percentages confirm that, while smoking was traditionally more related to masculine identity, this association is decreasing and only exists in the minds of a few students. Moreover, boys were significantly more likely to believe that smoking helps them to look masculine (12% versus 8% of girls), which means that, for some boys, smoking is still a way to construct their masculine identity, a hypothesis that we

discussed earlier. These results seem to corroborate the aforementioned hypothesis about the absence of gender gaps in smoking: maybe gender socialization does not treat smoking as a risky behavior that girls should be discouraged from to the same extent as cannabis use or binge drinking. Further studies are needed, however, to test this hypothesis.

Finally, in the last category of beliefs (negative social beliefs), we expected girls to score higher than boys. Socialization theory states that girls are more sensitive to their social circle's opinion of them (their social image), and will thus be more afraid of getting into trouble because they have broken school rules by smoking (Stockard, 2006). The results relating to social image confirmed that girls were more likely to believe that their friends would disapprove if they smoked, but no gender difference was found for parents' or teachers' disapproval. In terms of gender socialization, this result was surprising: both parents and teachers are agents of gender socialization, which is expected to be more accepting or permissive of substance use among boys than among girls: for boys, substance use is part of the construction of masculine identity (Sauvadet, 2006b). The results might thus suggest two concurrent hypotheses: (1) girls underestimate their parents' and teachers' disapproval of smoking or, more likely, (2) tobacco is not considered a substance that is damaging for girls' social image (unlike alcohol or cannabis, see above). Although these results show that gender socialization does not fully explain these aspects of negative social beliefs, our results nonetheless confirmed that girls were slightly more likely to believe that smoking would get them into trouble (80% of girls, 76% of boys). Girls thus seem to be more aware of the risk they would be taking if they smoked cigarettes at school. This finding led us to investigate the gender differences in the mechanisms explaining how School Tobacco Policies reduce adolescent smoking.

Do boys and girls differ in their reactions to School Tobacco Policies?

In Chapter 10, we considered four mechanisms that explain how School Tobacco Policies (STPs) help to reduce smoking on school premises, and we investigated whether the genders were sensitive to these mechanisms to different extents. While the effect of STPs on smoking was slightly greater among girls than boys, we found that no mechanism had a greater impact on reducing smoking in one gender than the other. This seems to contradict part of our hypothesis, which emphasizes gender socialization. We will look at this question in more detail in the next few paragraphs.

Firstly, we expected girls to be more influenced by the mediating effect of negative beliefs in the relationship between STPs and smoking. While we did indeed find that having individual negative beliefs about smoking was associated with less smoking on school premises, this mediating effect was of a similar magnitude in both genders. Adolescents of both genders who were aware of the damaging effects of tobacco on their bodies and health were less likely to smoke. So, the effect of these beliefs on smoking reduction was the same in both genders.

Secondly, following gender socialization theory, which states that girls are more sensitive to fear of sanction, we expected girls to be more sensitive to the mediating effects of this mechanism (Stockard, 2006). But this was not confirmed by our analysis, which showed that the magnitude of this mechanism was, again, similar for both genders. Furthermore, in our sample, adolescent girls had lower total scores for fear of sanction than boys. This score was constructed using two dimensions: first, the belief that smoking would get the adolescent into trouble, which was more common among girls (see above), and second, knowledge of any existing (remedial, disciplinary, or harsh) sanctions for smoking in the school, which was more frequently reported by boys. Thus, girls seem to have internalized the risk of sanction more but seemed less aware of any people being sanctioned for smoking than boys. This might be explained by the fact that girls are sanctioned less than boys. An interesting study by Depoilly focused on the gender differences in rule-breaking behaviors

in high school. In her observational study, she found that girls were just as likely as boys to break school rules, but that they did so more secretly and quietly than boys. Because of their gender socialization, girls were more likely to behave according to the teachers' behavioral expectations when the teacher was near to them but broke the rule as soon as the teacher moved away. On the contrary, boys were more likely to break school rules loudly or in front of teachers. Girls might, therefore, be more aware of the risk of sanction, and thus break the rules more secretly than boys. As a consequence, they could be sanctioned less than boys but smoke on school premises just as much. Further study is needed, however, to assess whether girls are indeed smoking more secretly than boys at school²⁶.

Finally, we found that peer pressure was associated with higher levels of smoking in both genders, though we had expected girls to be more sensitive to this mechanism too. The literature on social networks stated that girls were more sensitive to peer pressure than boys (McMillan et al., 2018). The effects on smoking reduction of peer pressure and other mechanisms that were expected to have greater influence on girls' behavior, had, on the contrary, the same magnitude for both genders. This could also corroborate the assumption (mentioned earlier) that gender socialization does not treat smoking as a risky behavior that girls should avoid.

Our measurement of peer pressure, however, was not constructed using social network measures, which had been used in other studies of peer effects on smoking. We asked

²⁶ During the Silne R project, however, we went to schools to provide feedback to school staff and received this explanation: adolescents smoke in the toilets, which are gender-specific, and the school staff members that sanction smoking are mostly male, which means they feel that it is less legitimate for them to enter the girls' toilet to sanction them. Once again, this alternative explanation should be confirmed by further study.

students directly how they would react if a friend offered them a cigarette. So our indicator considered the expected response of students to peer pressure, which may be different from how they would respond in real life. Elsewhere, we also found (Lorant, in review) that the reduction in smoking prevalence between 2013 and 2016 that was attributable to peers was higher among girls (73%) than boys (70%), which suggests that social network measures are more suitable than declarative answers for the analysis of peer pressure. Moreover, the study of peer pressure should also consider the configuration of the peer groups of which students are members. These two assumptions were addressed in Chapter 9. In the next few paragraphs, we will review how peer group configuration differs according to gender, how gender socialization may explain these differences, and how it could affect smoking norms in peer groups.

Do girls and boys differ in their peer group configuration and how does this affect peer group norms regarding smoking?

During adolescence, friends are of great importance, and belonging to a peer group is an important part of an adolescent's everyday life (Deutsch et al., 2014). Adolescents are members of several peer groups, which can be described as social layers according to their proximity to the adolescent. Adolescents have one or a few small groups of best friends (cliques) and a larger circle of acquaintances, but they also belong to their school friends' circles.

Peers are important to consider in relation to risky behaviors: the literature on risky behavior has, for a long time, recognized that, via influence or selection (see above), peers tend to share similar risky behaviors (Centola, 2011; McPherson et al., 2001). To influence or select their friends, adolescents must share similar norms regarding a behavior: they may share similar descriptive norms (seeing peers actually displaying the behavior), but this norm sharing can also take the form of injunctive norm sharing. Injunctive norms relate to the

social (un)formulated injunction to behave in a particular way (see above). To study this type of norm, we referred to the negative social belief scale described in Chapter 8, which contains all the social reasons and injunctions not to smoke that an adolescent may believe in.

Our results indicate that these injunctive beliefs are deeply embedded in adolescent peer groups: peer group membership explained 51% of the variance in negative social belief scores. This confirms that these kinds of beliefs are shared and constitute peer group norms.

Furthermore, our results confirmed that the more proximate a peer group is (clique versus community, for example), the more a norm is shared. Thus, adolescents tend to share norms regarding smoking with their best and closest friends. This might corroborate what the Prototype Willingness Model predicted about the role of prototypes: people are more likely to endorse a prototype's behavior if he/she is similar to him/her, an assumption we tested using the social network measure of homophily (McPherson et al., 2001). When we did so, we found that individuals who were similar in terms of smoking status tended to share similar norms. Thus the sharing of injunctive norms is reinforced by descriptive norm sharing: adolescents who (don't) smoke tend to influence injunctive norm sharing in other adolescents. Further studies are needed, however, to test this theoretical model and the role of norm sharing between the prototype and the adolescent in particular.

Our study, however, was aimed at determining how peer group configuration and norm sharing differ between genders. First, we found that both genders mostly share norms with their best friends and closest peer groups. Peer groups membership, however, explained a larger share of the variance in negative social norms (injunctive norms) among girls than boys (55.5% among girls, 45.1% among boys), which means that the peer effect on tobacco-related injunctive norm sharing is higher among girls than boys. Adolescent girls are known to have more intimate friendships than boys, while boys tend to belong to peer groups that are based on sharing common activities (Amanda J. Rose & Karen D. Rudolph, 2006;

Stockard, 2006). According to our results, girls did indeed have higher levels of reciprocity in their friendship ties than boys (44% of reciprocated friendships for girls, 34% for boys). This reciprocity and intimacy in friendships among girls might lead girls to talk more to their friends than boys, which may explain these differences, as injunctive norms are based on talking. To confirm this assumption, further studies should investigate the role of friendship intimacy in norm sharing.

Regarding similarity, we found that adolescents of both genders shared norms with peers who were similar in terms of smoking status. Having the same smoking status explained a significant proportion of the variance in smoking-related norm sharing. Our study also showed, however, that girls with same-sex friends tend to have higher levels of injunctive norms regarding tobacco than girls with other-sex friends. Among girls, same-sex friendships thus have a direct protective effect on tobacco norms; this was not found to be the case among boys. Girls' tendency to cultivate intimacy with friends might be encouraged when those friends are also female. Talking about injunctive norms regarding tobacco might be easier in more intimate girl-to-girl conversations. This result should be considered alongside girls' tendency to have greater gender homophily than boys. Indeed, Chapters 6 and 7 confirmed that girls were more likely to have same-sex friends than boys, even though both genders have a large majority of same-sex peers.

Another difference between the genders is the influence of reciprocity on smoking norms: reciprocity, as a fixed effect, protects boys to a greater extent than girls. Individuals of both genders, but especially boys, with more intimate friendships tend to score higher for negative social beliefs. Intimacy of friendship thus has a direct protective influence on risky behaviors. However, as mentioned in Chapter 2, the gender socialization of boys does not promote intimacy, feeling, and sharing between peers (Stockard, 2006). Boys are expected to share activities, not feelings, with their male friends. A change in such social prescriptions might be particularly good for adolescent boys' health. In the next section, we will address

the idea of taking advantage of a change in gender socialization to improve health interventions. We will start, however, by describing how the aforementioned results can inform seven intervention methods for changing risky behaviors and smoking in particular.

Part 2: How could smoking interventions be better tailored to take gender into account?

In the previous section, we acknowledged the gender differences (if any) in substance use, beliefs, reaction to STPs, peer group configuration, and norm sharing. In this section, we would like to examine whether these results may help smoking intervention to be better tailored, in including gender and gender socialization. This Phd thesis, however, does not focus on health promotion interventions. Indeed, both the design of the survey and the research questions addressed do not test any intervention protocol. Our purpose here is to enlighten some of the health intervention strategies with our results. Further studies, specifically dedicated to health intervention evaluation, should nonetheless test for these strategies before drawing any conclusion on including gender in health intervention protocols.

In order to take gender differences into account when designing health promotion programs and interventions, there are two alternative paths that can be followed. On the one hand, if there were large gender differences and the mechanisms affected the genders differently, that would suggest that it would be beneficial to design **gender-specific interventions**, which address smoking among boys and girls differently. On the other hand, small gender differences and marginal differences in the influence of the mechanisms, however, would suggest that it would be more appropriate to **adjust a single framework** to certain gender particularities. Our results indicate that, as far as tobacco smoking is concerned, behaviors, beliefs, STP mechanisms, and norm sharing in peer groups are roughly the same among boys and girls, though some specificities were found. Consequently, this thesis supports the hypothesis of making marginal adjustments to smoking interventions, in order to better tailor them to gender particularities, rather than designing different interventions for girls and boys. For example, we might consider choosing girls to deliver messages about negative social beliefs to other girls or making

specific modules that reinforce self-efficacy particularly available to girls. In the next few paragraphs, we will briefly review some smoking intervention strategies and consider why such adjustments could be necessary, and how they might be implemented, in light of the results presented above.

In “The behaviour change wheel: A new method for characterising and designing behavior change interventions”, S. Michie and colleagues (2011) described nine intervention methods aimed at changing behavior. This model, the Behaviour Change Wheel (BCW), has the advantage of taking into account contextual features and intervention methods relating to the three direct components of a change of behavior: capability, motivation, and opportunity. Below, we will focus on these intervention methods and explain why our results do not advocate gender-specific approaches to each method but might, in some cases, suggest marginal adjustments. The BCW identifies nine intervention methods. Our results seem to particularly apply to six of them, which we will thus focus on.

1. **Persuasion.** According to Michie and colleagues, persuasion is the use of “communication to induce positive or negative feelings or stimulate action.” This method particularly applies to the *messages* that should be communicated during smoking interventions. In this thesis, we found that **negative social beliefs about smoking were of considerable importance in reducing smoking**. As argued by Ruiz-Moral (2015), the fact that the negative outcomes of smoking are mostly long-term risks makes them difficult to use in prevention for adolescents. Our study, however, showed that negative outcomes can also be short-term, such as “getting into trouble” or friends’ disapproval. These beliefs are, moreover, largely shared within peer groups, making them **peer group norms** that interventions could target (Chapter 9, see also below). They were also associated with smoking status: peer groups of smokers were less likely to have such negative social beliefs than non-smoker

peer groups. Furthermore, in Chapter 10, we considered negative beliefs as a mechanism via which School Tobacco Policies (STPs) reduce smoking on school premises. Although slightly more commonly held by girls than boys, **negative beliefs decreased smoking equally in both genders**. This means that interventions using smoking beliefs could benefit both genders and should not be gender-specific.

In concrete terms, three main negative social beliefs related to short-term disadvantages of smoking could be emphasized in smoking interventions. Firstly, messages could emphasize the fact that **some parents would not let a smoker babysit their children**, a common form of income for adolescents. Secondly, knowledge of smoking bans at school and similar sanctions could be reinforced in order to highlight how **smoking at school can get students into trouble**. Last but not least, the **disapproval of smokers' friends** is also a short-term consequence of smoking and, because friends are particularly important in an adolescent's life, smokers' friends could be a factor in smoking prevention. Thus, peer-led interventions to prevent smoking could be particularly effective and further studies should pay attention to gender patterns in these interventions (Campbell et al., 2008).

The effectiveness of **persuasion**, obviously, depends on the credibility of the person delivering the message. Our study demonstrates that peers are responsible for 51% of the variance in beliefs: they have a strong influence on adolescents' smoking beliefs. Our study thus shows that **peer interventions** are a promising approach. More precisely, we determined that these interventions could **preferably be provided by reciprocal and similar peers**. Girls are slightly more likely to share beliefs with friends of the same sex, while

the influential power of boys is strengthened by reciprocal friendships (see Chapter 9). These are the kinds of adjustments that a peer intervention could take into account in order to maximize its effect on both genders. Finally, our results identified an interesting peer group configuration to intervene in: a **peer group of three to four members**. Intervention strategies aimed at regular smokers and non-regular smokers could, however, differ. **Non-regular smokers could be addressed separately from regular smokers**. Intervention strategies addressing non-smokers could thus favor peer groups of non-smokers only. Regular smokers, however, would benefit from the influence of non-regular smokers in their peer group, who will be responsible for spreading the message. Further studies could, therefore, test groups of three non-regular smokers and one regular smoker, in order to increase anti-smoking beliefs among regular smokers. **However, such studies should carefully consider the side-effects of peer interventions and the messages they carry** (Peretti-Watel & Moatti, 2009): friends' disapproval might, for example, increase smokers' stigmatization (Robert et al., 2020).

2. **Coercion**, which is defined as “creating expectation of punishment or cost”, was analyzed in Chapter 10. We considered the fear of sanction as a mechanism explaining the impact of STPs on smoking reduction. Fear of the consequences of a behavior is a well-known factor in health prevention strategies (Conner M., 2005b) but, according to our results, **the current approach of STP enforcement via sanction seems not to be an appropriate tool for reducing smoking in either gender**.

3. **Restriction** is “using rules to reduce the opportunity to engage in the target behavior (or to increase the target behavior by reducing the opportunity to engage in competing behavior).” STPs are, per se, a restriction on smoking on the school premises and, as demonstrated in Chapter 10, **STPs are an effective tool for reducing smoking in both genders**, and especially in girls, which, as was pointed out earlier, is an important challenge to address. Following our results, STPs could, therefore, continue to be implemented in high schools as a means of reducing smoking.
4. **Modelling** is “providing an example for people to aspire to or to imitate,” a concept that we already looked at in Chapter 3, in relation to the prototypes in the Prototype-Willingness Model. We have already addressed the role of best friends in sharing smoking-related injunctive norms (negative beliefs) but we should also consider the direct influence of their behavior on an individual’s behavior (descriptive norms). **School environments should emphasize healthy models to adolescent girls and boys.** These models should, according to our results, be **as similar as possible to the adolescents as well as likable.** Currently, even when smoking is banned on school premises, smokers group together in front of schools, making them, paradoxically, particularly visible. The Silne R study also found that both students and school staff smokers were particularly visible at school gates. We would thus suggest **extending the smoking ban to the areas surrounding schools and developing additional ways to promote healthy role models for students of both genders.** For example, older, popular, non-smoking students might for serve as role models for healthy behaviors. Further study could be undertaken, however, to evaluate this design and, in particular, their possible differential impact on boys and girls.

5. **Enablement** consists of “increasing means/reducing barriers to increase capability or opportunity.” We addressed enablement in Chapter 10 in considering control over the decision not to smoke as a mechanism increasing the effect of STPs on adolescent smoking reduction. We found that this mechanism was only significant in reducing smoking among girls, not among boys. Feeling in control of the decision not to smoke may thus help dependent girls to avoid smoking. This concept is close to the Self-Efficacy concept developed by Bandura, which has been used for years in smoking cessation programs (Bandura, 1977; Conner M., 2005a); thus, **strategies for enhancing self-efficacy already exist and could be implemented in school programs addressing smokers, and girls in particular.** Further studies evaluating this strategy and its differential impact on boys and girls should however be undertaken.

6. **Environmental restructuring** refers to changes to the “physical or social context”. Our thesis has largely discussed how majority-male contexts in particular promote risky behavior norms. Indeed, in those environments, all adolescents were more likely to smoke, binge drink, use cannabis, and perform badly at school than adolescents in any other school context. The influence of boys in promoting risky behavior is present in male-dominant contexts in general, but it also colors all boy-to-peer interactions, including risky behaviors (see Chapters 6 and 7). We therefore advise interventions to incorporate a gender perspective, which will enable the deconstruction of masculine norms in those schools. Such perspectives on **gender norm deconstruction could, however, target adolescents of both genders, and should be, as other strategies, evaluated.**

Deconstruction of school gender norms is central to reducing risky behaviors among adolescents of both genders. On many occasions throughout this thesis, we have acknowledged that girls are better protected from risky behaviors if they have same-sex friendships and if they do not attend majority-male schools. The initial reaction to these statements might be to withdraw girls from male environments and to strongly promote girl-only activities and friendships in order to limit cross-gender relationships. This solution, however, would fail to improve adolescent health for several reasons.

Since the 1970s, gender mixing at school has been a central pillar of gender equality. By attending the same schools as boys, girls have progressively gained access to the same opportunities as them. They have raised their level of education, which has enabled them to apply for better jobs and thus to gain (financial) independence. Attending better schools has made them better able to make their own decisions, including about their own health (consider the concept of health literacy). A gender perspective will thus never advocate separating girls from boys at schools because the costs would far outweigh the advantages.

Furthermore, even if we withdrew girls from boys' schools, boys would continue to experience the consequences of their risky behaviors. The solution is thus not for women to leave male spheres, but rather for men to enter women's spheres. Health promotion and school environments could participate in socializing boys to embrace the positive aspects of girls' socialization. The solution is thus to socialize boys to be less oriented towards risk-taking, to be more respectful of the rules, to put themselves in danger less, and to pay more attention to their bodies and health. Socialization agents (parents, schools, and peers) could also stop making substance use more "OK" for boys than for girls. To achieve this goal, smoking interventions and health promotion in general could take gender into account in a structural way. **We strongly advise further studies to evaluate the inclusion of gender in smoking intervention.**

What are the limitations of this study and how could further research help?

The first limitation of this work is related to the study design. The Silne R project consisted of two waves of data collection, which did not follow the same students. Of the 65 schools which took part in the project, only 38 were included in the samples from both waves of data collection. Consequently, this repeated cross-sectional design enabled us to clearly conclude about any causality assumption. For example, we could not state for certain whether gender homophily causes risky behavior or vice versa. We therefore recommend that those conducting further longitudinal surveys properly disentangle this association.

Secondly, our study would have benefited from additional and more precise data on the actual substance use behavior of students. For example, in the chapter about STPs and smoking on school premises, we would have benefited from a more objective measurement of school ban infractions (e.g. “during the last week, how many times did you see a student smoke on school premises?”). Further studies might also monitor school ban infractions via school staff declarations over a whole year to get a clearer picture of these infractions.

Thirdly, the measurement of relationships with the other gender may also have suffered from a limitation: our question that assessed friendship did not ask for boys’ and girls’ friends separately. This may have led to other-sex friendships being underestimated. However, to limit mismeasurement, our questionnaire clearly specified that adolescents could indicate both boy and girl friends. Nonetheless, specific (qualitative) data related to same- and other-gender interactions would help us to better understand the influence of other-sex and same-sex friendships on adolescent behaviour.

The fourth and main limitation of this PhD thesis concerns gender and gender socialization. The aim of the Silne R project was not to study this question. We thus lacked strong evidence on gender identity and the gender socialization of individuals. We therefore had

to base our analysis on the gender which was declared by the adolescents in answer to the question “are you a male or a female” in order to classify them in the boy or girl category²⁷. We strongly believe that further study should investigate the actual gender identity of adolescents in relation to their risky behavior in more depth. We have discussed most of our results with reference to the literature on gender socialization, which has helped us to frame our results theoretically. These results should, however, be tested in further research focusing on how adolescents are socialized by parents, school, and peers to accept their gender roles. We also think that qualitative research should take a more in-depth look at what cannabis, alcohol, tobacco, and school performance mean to boys and girls, and how they contribute to their gender identity and their relationships with the other gender.

This PhD thesis has consistently used gender socialization theories to explain how gender and gender relationships are associated with risky behaviors. We chose to discuss our results with reference to sociological studies for two main reasons. The first reason is that there is a lack of biological literature on this subject: aside from the puberty studies presented above, we could not find any studies discussing the relationship between hormone levels, other-sex friendship, and risky behavior. The second reason is the social embeddedness of risky behavior, which has been widely acknowledged in recent decades. Our results regarding peer group membership are revealing: adolescent peer groups explain 51% of the variance in smoking norms and adolescents group together according to their smoking status.

Nonetheless, we must not reject the hypothesis that alternative theories might provide more explanations. In the second chapter, we discussed extensively the opposition between

²⁷ As mentioned in Chapter 5, in the first wave of the Silne project, the German questionnaire contained a question about gender identity. It asked students to answer both these questions “to what extent do you feel feminine?” and “to what extent do you feel masculine?” In this German sample, 2% of women felt “not so feminine” or “not feminine at all” and 0.5% of boys felt “not so masculine” or “not masculine at all”. Unfortunately, this question was not asked in 2016, nor was it asked in other countries. We therefore also suggest that further research study multiple dimensions of gender identity (see Chapter 2).

biological/naturalist and sociological/constructivist approaches to gender. We concluded that the two theories should complement one another in gender studies. While we used gender socialization theories to examine the process by which people gradually learn how to behave in accordance with gender role expectations, we might also have used biological features to explain our results. For instance, we might have found that the girls with higher levels of risky behaviors are also those who had already gone through puberty. This measurement has been found to mediate the relationship between other-sex friendship and substance use among girls, in that girls who experience puberty early have more other-sex friends and are more likely to engage in substance use (F. Poulin et al., 2011). However, to limit this bias, all our results were controlled for age, which is correlated with the timing of puberty. We might also have found that boys with lower levels of testosterone tend to develop more reciprocal friendships with their friends, which would have meant that the protective effect of reciprocity on smoking beliefs could be explained by hormone concentration. As stipulated in Chapter 2, we strongly advocate a reconciliation of biological and sociological sciences in gender studies and think that biological measurements might be beneficial to gender studies. We thus recommend that future research take these biological measurements into account.

Finally, as we found gender socialization to have such a strong influence on adolescent behavior, we must not reject the hypothesis that gender socialization also had an influence on the data collection process, a limitation that we will discuss in the next few paragraphs²⁸. More precisely, we will consider how the gender socialization of girls might have limited how truthful they were in their responses to the questions related to the most extreme of the risky behaviors considered in our PhD thesis: cannabis use. To do so, we will summarize the results of our master's thesis in sociology and anthropology, which was a literature

²⁸ This discussion point is actually a summary of our master's thesis in sociology and anthropology, which we have adapted in accordance with the data collected in the Silne R project.

review on the underestimation of cannabis use among girls in surveys. In this section, we aim to add further theoretical considerations to our study methods and results.

Adolescent girls and cannabis use: theoretical considerations on girls' substance use declaration in surveys.

Cannabis is the most frequently used drug in the adolescent population. Many studies have, however, found a higher proportion of cannabis use among boys than girls. Furthermore, there have been few studies of substance abuse among adolescent girls in particular, with some exceptions (Obradovic, 2009; Obradovic, Le Nézet, & Spilka, 2013). Nonetheless, some of the interviews that we conducted among young cannabis dealers revealed that boys and girls have different practices when it comes to cannabis use, as described by one male dealer (aged 27)²⁹: “Of course girls smoke! Loads of them do! It’s just that they’re secretive about it. Apart from their boyfriend and maybe one or two friends, no one knows they smoke!” (“*Bien sûr que les filles fument! Y en a plein! C’est juste qu’elles sont discrètes tu vois, à part leur mec et p’t-être une ou deux copines, personne le sait qu’elles fument!*”) Although we should not take this statement for granted, it seemed appropriate, on that theoretical note, to take a step back and consider whether cannabis use is indeed more discreet among girls and how this might effect the measurement of cannabis use rates in quantitative surveys. We finally came up with a general question: is the gender gap in adolescent cannabis use as big as it seems in the surveys? We postulated that gender socialization leads to a decrease in the visibility of cannabis use among girls and in their willingness to declare this behavior in surveys.

²⁹ This interview was carried out in 2013 for an anthropology class that led us to devote our master’s thesis in sociology and anthropology to female cannabis use. In this section, we consider the main findings of that master’s thesis in relation to the reflections on substance use among girls in our PhD thesis.

According to Beck and Peretti-Wattel (Beck & Peretti-Wattel, 2001), truthfulness of response depends very much on the way data are collected: under-statement of cannabis use is particularly high in phone surveys. Going one step further, Aquatias raised similar concerns about school surveys (Sylvain Aquatias, 1999). He stated that, in this kind of survey, there is only minimal trust between interviewers and respondents and that these surveys “meet all the requirements for a study of the general population: on condition that they receive truthful responses from the subjects, they provide a correct measure of drug use... but, given the illicit nature of drugs and the institutional setting (in school) of the study, is it realistic to expect total honesty (Sylvain Aquatias, 1999) (page 54). Schools are not neutral places in terms of symbolic institutional power and, following gender socialization theory, girls are particularly keen to behave in conformity with school requirements. Few studies have tended to take identification with gender roles for girls into account in their analysis and few studies have investigated girl-specific forms of cannabis use (Obradovic & Beck, 2013). As stated by Coppel, “drug consumption in France is described in terms that are intended to be universal, in other words, in mostly male terms.” (Coppel A., 2004) (page 38)

The gender socialization of girls places great importance on the role of appearance, which is the social image that they present of themselves to peers, teachers, and parents. We can therefore postulate that, when they break the law by using cannabis, they tend to preserve this social image, for example, by avoiding smoking cannabis in public.

“The ways in which young men use [cannabis], which are more collective, are more likely to get them into trouble with the law, whereas female use is dominated by a preference (in a sociological sense) for less visible and more solitary forms of use.... Furthermore, in the specific context of adolescence, boys are more encouraged to ‘put on a performance’ with their risky behaviours by acting in a more provocative and transgressive way [Le Breton, 2000], are driven by the desire to distinguish themselves among their peers: ‘taking’ alcohol

or cannabis is thus a rite of passage that enables them to solidify their place within the group, because losing the group's approval represents a more significant risk than the legal risk.” (Obradovic & Beck, 2013) (page 116)

According to Pedersen et al. (2001), identification with their gender role has two consequences for girls. Firstly, they are more sensitive to social warnings and, consequently, are better at avoiding being caught. Secondly, as gender roles characterize girls as victims rather than as guilty, law enforcement forces tend to pay less attention to their behavior.

In the classroom, girls also tend to make their deviant behavior less visible. According to Depoilly, while girls tend break rules in the classroom to the same extent as boys, girls do so in a less visible way. They hide their phones better, they tend to lower their voices when the teacher is nearby, and they also adopt a “pretence of a school-appropriate attitude” (“*simulacre de jeu scolaire*”) (Depoilly, 2012b), picking up their pens or acting as if they were studying. Moreover, as stated by Depoilly, during their long observation “We never observed, in all our hours of study, any direct, face-to-face, and deliberate challenges to the teacher's actions.”.

We should, therefore, acknowledge that girls are not necessarily more conformist. They are more likely to break rules in more discreet ways than boys. In an article about deviant behavior among girls, Ruby (2003) describes how girls use the favorable preconceptions that exist regarding cannabis smoking among girls. She describes how girls can play up their gender role and fake innocence in front of policemen.

However, we should not forget an important pattern of substance use among girls: for a long time, substance use among women has been socially sanctioned. According to Hoareau (Hoareau E., 2012), women drug users are still associated with three different social images: the victim, a woman who is under the influence of an abusive man; the “fallen woman”, a woman who is too neglected to be able to act in the way that society expects a woman to

act; and the “emancipated woman”, who is comfortable with her deviance but who threatens society’s moral order. In order to avoid being categorized in this way, girls would limit the visibility of their illegal drug use and under-state their use in surveys.

What about the Silne R study?

The Silne R study is a school survey, meaning that the place of data collection is not symbolically neutral. In the classroom, we expected girls to be less likely to answer questions about cannabis use truthfully. In order to avoid this bias, we put several strategies in place. Firstly, we asked all teachers to step out and we remained alone with students during data collection. Secondly, we took time to explain how their answers would be treated, and how anonymity was guaranteed: we stated clearly that neither their parents nor the school staff would ever be aware of their answers. We explained that we had received both *Commission de la vie privée* (data protection authority) and ethical committee approval for our data protection policy. We then carefully answered their questions, in order to limit their concerns. Then, we never asked for their names; instead, we asked them to report the code that corresponded to their name on the list of students that was used for social network analysis questions (see Chapter 4). The list was destroyed after each school data collection, so that the code they used to self-identify could not be linked to their name. Finally, we provided an envelope in which they had to put the questionnaire at the end of data collection. They had to seal it themselves and make sure that there was no way to identify them. Nevertheless, even these strategies might not fully prevent the under-statement of illegal drug use among girls in this survey. This might at least partially account for a small part of the large gender gap observed in cannabis use among adolescents.

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CHAPTER 12 – Conclusion

The relationships of adolescent boys and girls have an impact on their risky behavior. Our study is one of the first to investigate the role of gender and gender socialization in risky behaviors, using a European social network survey. This PhD thesis contributes to the current literature by answering the three following questions:

(1) Do boys and girls differ in terms of risky behaviors?

The answer to this question has three parts. Firstly, it depends on the substance. While boys use more cannabis and binge drink more than girls, gender gaps in low school performance and tobacco smoking have narrowed recently. The results of our thesis results led us to conclude that the more socially risky a behavior is, the greater the gender gap will be. Regarding smoking, we observed that the gender gap is no longer significant. Our thesis also investigated different aspects of tobacco smoking: smoking beliefs, tobacco norm sharing in peer groups, and boys' and girls' reactions to School Tobacco Policy mechanisms. Even though slight differences between genders may have been found, we should nonetheless conclude that boys and girls have similar beliefs and patterns of norm sharing and react to STPs accordingly. Discussing these results led us to postulate that gender socialization no longer treats tobacco smoking as a behavior that girls should avoid, unlike more socially risky behaviors (cannabis use and binge drinking), for which boys still display higher rates than girls.

This conclusion about risky behaviors among boys and girls must take another aspect of gender socialization into account: relationships with peers, which are of particular importance during adolescence. Our PhD thesis found that girls who were friends with boys were always more often risk-takers, compared to girls who were friends with girls. Thus, while the normative expectations relating to gender roles that gender socialization fosters differ depending on the substance, relationships with boys still promote risk-taking norms and that influences girls' behavior. Moreover, this normative influence is also a factor for

boys who are friends with boys, who were more likely to be cannabis users and binge drinkers than boys who were friends with girls.

Thirdly, our results advance the analysis of normative influences in evaluating the influence of a school's gender context on risky behaviors. Male-majority schools are places where risky behaviors are particularly present. This means that they convey particularly risky norms that should be addressed, for example, during health promotion interventions. This last consideration led us to the second question we want to conclude with.

- (2) How could smoking interventions be improved by taking gender into account? Should we take gender, gender relationships, and/or gender context into account?

Even though the purpose of this thesis was not to test for smoking interventions strategies, our results have provided several possible guidelines for future smoking interventions at school from a gender perspective. Firstly, we do not favour making gender-specific interventions addressing smoking; instead, we would advise making marginal adjustments to better tailor smoking interventions to some of the gender specificities in smoking that we have drawn attention to. Secondly, we suggest implementing peer interventions to take advantage of the strong peer-group embeddedness of smoking norms and the gender-relational aspects of substance use we mentioned above. Finally, we would like to take into account the gender-normative context of the school when designing interventions, for example, by addressing male gender norms in male-majority schools.

- (3) How can future research improve knowledge about gender relationships and risky behaviors among adolescents?

As far as future research is concerned, we recommend an inclusive approach to gender that reconciles the sociological and biological aspects of an adolescent's gender identity. Finally,

we recommend that future research investigate gender-relational and normative dimensions of risky behaviors using social network and qualitative research.