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Contrasting smokers' and snus users' perceptions of their personal tobacco behavior in Norway

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Original investigation:

“Contrasting smokers’ and snus users’ perceptions of their personal tobacco behaviour in Norway”

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ABSTRACT

Introduction In Norway, snus use and cigarette smoking are at different developmental stages as described by the diffusion of innovation model. Concomitant with declining smoking rates, the use of snus is increasing. In light of these differences in use trends, we assumed that snus users and cigarette smokers would have different perceptions of their personal tobacco use. **Methods** A total of 4 852 smokers and snus users were recruited from a large sample of online panellists (n=62 000) and a postal database (n=15 000). The responses to 16 evaluative statements assessing perceptions about tobacco use were compared between exclusive snus users and exclusive smokers, and within dual users. The statements concerned self-evaluative emotions, moral judgements, social disapproval, and benefits of quitting. **Results** The perceptions of personal tobacco use differed greatly between exclusive smokers and exclusive snus users, even after controlling for age and sex. Smoker's perceptions were more negative compared with snus users' perception. The differences between smoking and snus use were particularly large for indices of social disapproval (Cohen's $d=1.56$) and benefits from quitting use of the product (Cohen's $d=1.47$) between exclusive users. Dual users exhibited a similar pattern. **Conclusion** Smokers have more negative perception of own use compared to snus users. Dual users also devaluates smoking in comparison to their snus use. This finding may have important values for prevention strategies targeting smokers, snus users and dual users.

Word count=230

INTRODUCTION

The present configuration of the cigarette epidemic in Norway displays many of the characteristics typical for the final stage in the descriptive four-stage model of the diffusion of cigarettes in industrialized countries (Lopez, Collishaw, & Piha, 1994). In this progressed stage, the number of smokers has decreased and the group of smokers is characterized by a decline in social economic and political power (Hiscock, Bauld, Amos, Fidler, & Munafò, 2012). Several studies have used the diffusion of innovation (DOI) model as a framework for analysing the cigarette epidemic at the societal level (Ferrence, 1990; Redmond, 1996; Rogers, 2003). In Norway at present, 26% of the Norwegian population smokes cigarettes daily (16%) or occasionally (10%) (Statistics Norway, 2012).

The use of snus has been increasing in Norway, and the current pattern of snus use seems to display many of the characteristics typical of stage II in the descriptive model of the diffusion of cigarettes (K. E. Lund & McNeill, 2013). In stage II, there is a rapid increase in smoking prevalence among men, and the prevalence in women lags behind but is increasing (Lopez et al., 1994). The statistics shows that the typical snus user in Norway is a young male but that young females are taking up the habit gradually (Norwegian Directorate of Health, 2013a). At present, 13% of the Norwegian population use snus daily (9%) or occasionally (4%) (Statistics Norway, 2012). Norway is similar to many other Western countries regarding smoking prevalence and tobacco control efforts to combat smoking. However, because of the use of snus, Norway and Sweden stand out as special cases.

Tobacco control strategies such as media campaigns, regulatory actions and persuasive efforts to change the social norms around tobacco use have been labelled as the process of denormalizing tobacco (Hammond, Fong, Zanna, Thrasher, & Borland, 2006;

Moore, 2005). In Norway, tobacco control has focused mainly on denormalizing cigarette smoking and has been directed less towards snus use. Cigarette packs carry graphic health warnings about cancer, stroke, emphysema and heart failure, but snus boxes have warnings only in a text format and these focuses exclusively on the potential addictiveness. Fuelled by governmental actions, such as smoke-free policies and media campaigns stressing the danger of second-hand smoke, smoking has become increasingly deviant (Graham, 2012; Peretti-Watel, Beck, Legleye, & Moatti, 2007; Ritchie, Amos, & Martin, 2010; Stuber, Galea, & Link, 2008).

The use of snus has not been subject to the same harsh restrictions or hard-hitting media campaigns as those directed at smoking. While smoking behaviour is socially downgraded and stigmatized, the status of snus use is less clear and has characteristics of innovation, novelty and appeal towards young people (Sæbø, 2013). The public health norms towards snus use may be unclear due to the ongoing debate about snus' absolute health risk and the relative risk compared to combustible tobacco (Grimsrud, Gallefoss, & Løchen, 2013; I. Lund & Scheffels, 2013). Differences in trend directions, user profiles and social status between smoking and snus use are observable at a macro level, but how does the users themselves evaluate their own smoking and/or snus use behaviour? One way of investigating whether the users of cigarettes and/or snus experience acceptance or deviance regarding their own behavior is to analyze smokers and snus users' experience of negative self-evaluative emotions (Dijkstra & Buunk, 2008) and aspects of perceived smokers stigma (Stuber et al., 2008).

The aim of the study was to examine whether exclusive smokers and exclusive snus users differ in their perceptions of own tobacco use. We also examined dual users, and how they evaluate their use of snus and cigarettes respectively. The findings in the present study

are discussed in light of so-called adopter categories from the DOI model, health and social consequences of use, and differences in tobacco control and regulations.

METHODS

Sampling and response

An independent research agency, Ipsos MMI, collected data from a sample of smokers and snus users drawn from a web panel of more than 62 000 Norwegians and a postal database of more than 15 000 Norwegians. An invitation was sent to those who in previous surveys had indicated that they were smokers or snus users (14 513 from the web panel and 2 756 from the postal database). Initially, 6 288 responded, but only 4 852 tobacco users completed the survey. The missing respondents were no longer users of tobacco or had dropped out of the survey process (about 5% on the survey's first page and 5% during the survey). There are no missing data on items because of the forced-choice format. More detailed information about the sampling procedure is described elsewhere (Halkjelsvik, Lund, Kraft, & Rise, 2013).

Measures

Tobacco use was assessed by the response options "yes, daily", "yes, occasionally" and "no, I do not use it". Exclusive users were those who used snus or smoked daily or occasionally. Dual users were those who smoked daily or occasionally and used snus daily or occasionally. Non-users of tobacco were excluded from all analyses.

Smokers reported their average number of cigarettes consumed daily (daily smokers) or weekly (occasional smokers). Consumption among daily smokers was computed into weekly consumption, and one cigarette was recalculated to 1 gram. Snus users reported the

type of snus they normally used; boxes with pouches (25 gram) or boxes with loose snus (50 g per box), as well as the approximate number of boxes they normally consumed during a week. Those who reported consuming equal amount of boxes of pouches and loose snus were set to a weight of 37.5 gram per box. Total consumption of tobacco (smoked and smokeless) in gram per week was calculated. Information about demographics and tobacco behaviour for each type of user is presented in Table 1.

To contrast the differences in perceptions about the participants' own tobacco use, smokers and users of snus were asked about their agreement or disagreement with 16 items (see Table 2). The response options were "totally disagree", "disagree", "neither agree nor disagree", "agree" and "totally agree". To present single items, the responses "agree" and "totally agree" were collapsed into one category. The statements for smokers and snus users had identical wording, apart from the label describing the tobacco type (snus vs. cigarettes). Dual users of tobacco responded to statements about cigarette smoking and snus use separately.

The statements about perceptions of personal tobacco used concerned self-evaluative emotions and expected outcome of quitting (physical and social), and were mainly derived from a battery of psychological assessments of self-evaluative emotions embedded in social cognitive theory (Dijkstra & Buunk, 2008). Perceived social norms towards smoking were measured by questions referring to devaluation of smoking behaviour (Stuber et al., 2008).

Analysis

Differences in tobacco use between exclusive smokers and exclusive snus users (*between*), and within dual users (*within*), are presented as the ratio of the percentage of respondents

who agreed or totally agreed with each statement about smoking divided by the percentage who agreed or totally agreed with the corresponding statement about snus use (Table 2). We examined the internal structure of the 16 items using principal component analysis (PCA). Since separate questions were given regarding smoking and snus, two separate PCAs were run for smokers and snus users. Four thematic groups were identified and named according to the items included in each component, as follows (ranged according to variance explained): *self-evaluative emotions* (six items), *expected benefits from quitting* (physical and social, four items), *social disapproval* (three items) and *moral judgements* (three items). The analysis showed similar pattern for smokers and snus users, except that the last fourth factor (moral judgment) regarding snus use had an eigenvalue below 1 (0.791). All component loadings were above 0.3 (Supplementary table 1). The PCA was performed for data-reduction purposes and to simplify the presentation. We constructed indices by computing the mean of the items for each component. Internal consistency (Cronbach's alpha, α) for each component was computed separately for snus users and smokers (see Table 2). The mean values, test of differences (independent- and dependent-sample *t* tests) and effect sizes (Cohen's *d*) were computed for the four components between exclusive smokers and exclusive snus users, and within the dual-user group (Table 3). The effect size is regarded as large if $d \geq 0.8$ (Cohen, 1992). Analysis of covariance was computed to test whether the inclusion of age and sex influenced the differences in mean scores between exclusive users (reported in text).

RESULTS

As shown in Table 1, differences in socio-demographics were found between exclusive smokers, exclusive snus users, and dual users of snus and cigarettes. The consumption of

cigarettes in grams per week was 48% higher in exclusive smokers than in dual user's consumption of cigarettes. The consumption of snus was 87% higher in exclusive snus users compared with dual users. This finding is consistent with other studies that reported lower smoking intensity among dual users compared with exclusive smokers (Hatsukami, Lemmonds, & Tomar, 2004; K. E. Lund & McNeill, 2013). In dual users, consumption of tobacco in grams did not differ between cigarettes and snus, but dual users reported a longer duration of use of and more attempts at quitting cigarette smoking. According to the aim of the present study to contrast evaluation of snus use and smoking using both a between-group design (smokers vs. snus users) and within-group design (dual users), less emphasis is given to the socio-demographic differences in the results.

The percentages of respondents who fully or partly agreed with the 16 evaluative statements about personal cigarette and/or snus use are presented in Table 2. On all items, smokers evaluated their smoking more negatively than did snus users. This pattern was also observed for the evaluation of cigarette smoking versus snus use within the dual-user group. The differences between smoking and snus use were statistical significant for all but one item, which showed the same directional pattern ("I try to hide my snus use/smoking when meeting people I do not know"). We also checked if there were differences within the group of exclusive snus users regarding former experiences with smoking or not. When contrasting mono snus users and snus users who were former smokers, we found few differences in the evaluations with three exceptions; there were higher percentages among mono snus users who regret they started with snus (49.1% vs. 35.8%), who believed their physical condition would improve if quitting (25.2% vs. 18.8%) and that they would become a better role model if they quit using snus (60.4% vs. 51.1%).

As shown in Table 2, the largest discrepancies between smoking and snus use on the single items were found for “non-users of tobacco despise us who use snus/smoke” (*between-group* ratio=5.1, *within-group* ratio=6.5); “I feel there is a strong social pressure towards quitting snus/smoking” (*between-group* ratio=9.0, *within-group* ratio=10.4); and “If I quit snus/cigarettes, people around me will be more satisfied” (*between-group* ratio=4.2, *within-group* ratio=6.7). Dual users made a clear distinction between their smoking and snus use for self-evaluative emotions such as being embarrassed (ratio=5.1), having a bad conscience (ratio=5.0) and feeling guilty (ratio=5.5). Dual users related such emotions more to their smoking and less to their snus use.

The thematic grouping of the items into indices gives an overview of the differences in perception towards smoking and/or using snus. The mean scores differed significantly for all four factors; *self-evaluative emotions*, *moral judgements*, *social disapproval* and *expected benefits from quitting* (Table 3). Analyses showed that the differences in the mean scores between exclusive users remained significant after controlling for age and sex (not shown). According to Cohen’s criteria (Cohen, 1992), the effect sizes were large for the comparisons between the two groups of tobacco users and within dual users on all components.

DISCUSSION

The main findings from the study are that smokers and snus users differ in their assessments of personal tobacco use. There were large differences between smoking and snus use, both between the tobacco-user groups and within dual users. Largest effect sizes were found on measures of social disapproval and benefits of quitting, both between users, and within dual users.

Differences in evaluations between smokers and snus users have also been observed in an evaluation study of an intervention in upper secondary school (Moshuus, 2010). Smoking was related to coping with stress, while snus use had a more recreational aspect. This study also showed that smokers were more interested in quitting smoking than snus users were in quitting using snus.

Smoking is now considered to be in the final phase of the cigarette epidemic, and sales statistics and tobacco surveys indicate that snus consumption is gradually taking over the cigarette market in Norway (K. E. Lund & McNeill, 2013; Norwegian Directorate of Health, 2013b). Smokers express high degree of user dissatisfaction reflected by negative self-evaluative emotions, negative social and moral norms and agreement regarding health gains from quitting. Snus, in its assumed early phase of spread, activates negative evaluation to a lesser degree than cigarette smoking. In this section, we will discuss the different perceptions towards using snus and smoking cigarettes with reference to the adopter categories (innovators vs laggards), health issues and social factors associated with the two tobacco products, and aspects of tobacco control and regulation.

Adopter categories: innovators versus laggards

According to the DOI model, the ideal types of adopters in the diffusion process have different characteristics. The innovators or early adopters have a cosmopolitan orientation and an interest in new ideas, and are role models in their social environment. Laggards are those who adopt late in the process, hold traditional values and have low socio-economic status. In one study, daily cigarette smoking was found to belong to a socio-cultural lifestyle characterized by marginalization, whereas snus users belonged to a segment characterized by youthfulness, technological skill and a socially active life (Sæbø, 2013). This finding shows

corresponding similarities among the ideal types of adopters (laggards and innovators) and smokers and snus users. Because the users of cigarettes and snus display such different social and cultural characteristics, it is probable that individuals form different perceptions of the two respective tobacco products. The smokers in the present study seemed to have adopted the non-smoking norm as reflected by their negative perception of own smoking behaviour. According to the DOI theory, *fatalism*, the degree to which an individual perceives lack of ability to control his/hers own future, is more pronounced among laggards compared to innovators. This illustrates a highly ambivalent situation among smokers in the late stage of the cigarette epidemic. The association between subjective antismoking norms (evaluation of how society in general approve or disapprove smoking) and antismoking attitudes (benefits of quitting, overall opinion in giving up smoking) have been investigated in another study, finding a positive relationship (Falomir-Pichastor, Mugny, Berent, Pereira, & Krasteva, 2013).

Snus users on the other hand have some similarities with the DOIs adopter group “innovators” (Sæbø, 2013). Innovators play an important role of introducing new idea into the social system. Snus users may be divided into several types of innovators; the “true innovators” consists of snus users with no previous experience with cigarette smoking. Snus users with former smoking status, or dual users, could also be regarded as innovators who have made a shift or plan to make a shift from one tobacco product to another. This group may adopt the new innovation because of its relative advantage, and in such cases the use of snus may be characterized as a preventive innovation; a new idea (tobacco behaviour) that is adopted “in order to lower the probability of some unwanted future event” (Rogers 2003, p.233). The widespread use of snus as a method for smoking cessation has been described in other studies (K. E. Lund, McNeill, & Scheffels, 2010; K. Lund, 2013; Scheffels,

Lund, & McNeill, 2012). However, the present study found few differences in perception of own use between these two groups of “innovators”.

Health consequences

Although the danger of cigarette smoking is heavily documented as a health hazard, the health risk of snus use is less clear (SCENIHR, 2007). The health risk of snus is regarded as substantially lower than the health risk from smoking cigarettes, but also as having “serious, negative health consequences” (Norwegian Ministry of health and care services, 2013). The use of snus is associated with increased risk of pancreatic cancer, increased mortality risk after myocardial infarction and increased risk of prematurity and preeclampsia (SCENIHR, 2007). Although snus use imply health risk, compared to smoking it is estimated at least a 90% reduction in the relative risk of snus use (Levy et al., 2004), and snus is ranked low on a harm scale comparing all nicotine-containing products (Nutt et al., 2014). There is no evidence that snus use implies health risk that does not also arise from smoking. Even though snus is not a new product in the Norwegian market, the present type of snus is different from previous types. Because of the production and storage methods, the new Swedish snus has a lower level of tobacco specific nitrosamines and polycyclic aromatic hydrocarbon compared with other smokeless tobacco products, including those used in Scandinavia before 1990 (Borgerding, Bodnar, Curtin, & Swauger, 2012; Stepanov et al., 2009).

While the scientific community debates how much lower the risks from snus versus cigarettes are, there seems to be an overestimation of the health risk from snus compared with that of cigarette smoking in the population (I. Lund & Scheffels, 2012; O'Connor et al., 2007; Överland, Hetland, & Aarø, 2008). However, the method used to measure the

perceived relative risk of snus and cigarette smoking has produced different estimates. When separate questions for snus and cigarettes are used instead of a direct comparison between the products, fewer people rate the harm from the two products as equal (Popova & Ling, 2013). In the present study, separate questions were asked about snus use and cigarette smoking. The health benefits of quitting smoking reported by smokers were much greater than the health benefits of quitting snus use reported by snus users. This may indicate that snus users regard snus as having few health risks. The differences in health risk between the two tobacco types may be an important mechanism for the differences in the evaluations. According to the diffusion theory, one aspect that determines the rate of adoption is the new innovations relative advantage (Rogers 2002). Relative advantage means that the new innovation is seen as better than the one it supersedes. The different evaluation of the two products between the two consumer groups, including dual users, may be a reflection of snus' relative advantage over cigarette smoking regarding health risk.

Social consequences

The public consequences of smoking cigarettes versus using snus are quite different. Combustible tobacco smoke pollutes the air and affects people in the surroundings, and the scientific evidence documenting the health risk of environmental tobacco smoke (ETS) is strong (IARC Handbook of Cancer Prevention, 2009). In contrast to cigarette smoking, the use of snus does not imply health hazards for others. The only reported third-party damage from the use of snus is an increased risk of stillbirth (Baba, Wikström, Stephansson, & Cnattingius, 2013; Wikström, Cnattingius, & Stephansson, 2010).

As the data in the present study show, less social disapproval is attached to snus use than to cigarette smoking. This may not only be due to differences in third-party health

consequences, but also differences in the social rituals towards using the product. The tobacco industry's own consumer reports on smokeless tobacco refer to positive aspects of the new, moist snuff as being the only tobacco "that could be used discreetly, as it reportedly did not interfere with speech, hands, or other activities, and did not require spitting" (Mejia & Ling, 2010). Cigarette smoking interferes or probably interrupts social interaction in a more distinct way compare to snus use, and this difference has been particularly prominent after the introduction of the smoking ban. The cigarette smokers have been put on sight in the public domain outside restaurants, bars and workplaces, and are thus more vulnerable to stigma processes.

Tobacco control and regulations

The adverse effects of ETS form the foundation of a variety of legal regulations of smoking in public places worldwide (Hyland, Barnoya, & Corral, 2012; Koh, Joossens, & Connolly, 2007; U.S. Department of Health and Human Services, 1986). The legitimate basis for banning snus use in public spaces is weaker than that for cigarette smoking. Smoking bans improve the physical environment and influence the social environment by changing smoking behaviour and social norms in relation to smoking (IARC Handbook of Cancer Prevention, 2009; Vuolo, 2012). Regulating smoking by legislation and restriction is considered an effective way of denormalizing smoking behaviour (Bell, Salmon, Bowers, Bell, & McCullough, 2010; Brown, Moodie, & Hastings, 2009). Introduction of smoking bans in bars and restaurants directly changes the smoker's social life because they must either refrain from smoking in such places or leave the facility to smoke. It is possible that the smoking ban introduced in Norway in 2004 decreased the social status of smoking and increased the attractiveness of snus as a substitute for nicotine delivery in places where smoking is forbidden (K. E. Lund,

2006). Smoking has now become a deviant behaviour, and the perceived stigma experienced by smokers has been highlighted in several studies (Graham, 2012; Ritchie et al., 2010; Stuber et al., 2008). Our study shows that smokers perceive negative social disapproval and moral judgement about their smoking.

The increasing public sentiment against smoking behaviour has been hypothesized as creating an unfavourable “smoking climate”, which in turn is partly responsible for the decrease in smoking prevalence (Kim & Shanahan, 2003). The social climate seems to be more favourable towards the use of snus than towards smoking. Even though there are regulations and restrictions towards snus use, the process of denormalisation does not seem to have taken place regarding snus. This is supported by studies among young people who report snus use as being trendier compared with smoking and who evaluate peers who use smokeless tobacco more favourably than those who smoke (Kury & Rodrigue, 1998; Wiium, Aarø, & Hetland, 2009). Our study shows that less than ten percent among exclusive snus users and dual users supports statements referring to social disapproval towards using snus. An important aspect of the rapid spread of snus is that snus has undergone several stages of product development, it is available in a variety of sizes and flavours, and is packed in pouches in colourful tin boxes. Research on cigarette pack design has shown that colours and logos are important ways to communicate brand image with consumers, especially in countries where advertising is prohibited (Wakefield, Morley, Horan, & Cummings, 2002). Snus as something new and innovative is maintained by constantly new products and package design, which is possible due to fewer restrictions on snus packaging design compared to cigarette packages.

The term “tobacco use” or “tobacco users” is often seen in news articles, used by health authorities, NGOs and the research community. Since cigarettes and snus are

substantially different tobacco products, including the user's perceptions related to the two products as this paper shows, it may be appropriate to separate the two products when communicating "tobacco use". Preventive interventions towards cigarette smoking and snus use needs to be type specific in order to reach out to the different user types. Interventions to combat smoking should take into consideration that smokers may experience strong negative emotions and social disapproval. Snus users perception of own use indicates that smoking cessation methods and intervention may not be directly transferable to snus users. Approximately one third of snus users admit there are some benefits from quitting, especially as being better role models, but the health benefits from quitting are not prominent among the snus users in this study. Our study did not investigate aspects of nicotine (or specific snus) addiction, and future studies on snus user's perception should look into this aspect.

Strengths and limitations

The many stages from the e-mail and postal database to the analytical sample of tobacco users imply substantial dropouts and nonresponse. It is therefore uncertain whether the data sample is representative for the Norwegian snus users and smokers. The responses from this sample were compared with data from an annual nationally representative telephone survey from Statistics Norway for the years 2006–2010. When comparing smokers and snus users in the two data sets, the present sample had a higher educational level. The differences in perceptions between exclusive smokers and exclusive snus users were supported by the differences within the dual-user group, indicating that the findings were not influenced by differences in the characteristics between groups. The strength of the

study is the combination of a between and within design to assess differences in perceptions of personal use of two types of tobacco.

CONCLUSION

There were large differences between smokers' and snus users' perceptions of their snus and cigarette smoking. One implication of this finding is that the term "tobacco user" may be less valuable as a general concept and that snus use and smoking should be treated as two different behaviours. The findings may also be of interest for tobacco control regarding design and implementation of intervention directed towards smokers or snus users. Future research should look into how smokers and snus user's perception of own behaviour develops further, and how these perceptions develop in relation to prevalence of use.

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DECLARATION OF INTERESTS

None declared

Table 1. Socio-demographic characteristics and profiles of tobacco users in the study

	Group 1 Exclusive cigarette smokers (n=3 401)	Group 2 Exclusive snus users (n=885)	Group 3 Dual users of cigarettes and snus (n=566)	
Socio-demographic variables				
Male (%)	46.2	84.2	73.3	
Mean age	50.2	43.2	40.7	
Education level				
Primary or lower secondary ¹	16.1	10.8	10.8	
Upper secondary	38.8	28.8	36.0	
Tertiary (university)	45.4	60.3	53.2	
Population density				
Urban	56.5	58.3	67.1	
Rural	43.5	41.7	32.9	
Tobacco status				
Snus user status				
Daily		84.1	48.6	
Occasionally		15.9	51.4	
Smoking status				
Daily	79.3		51.6	
Occasionally	20.7		48.4	
Tobacco consumption, duration and attempts to quit			Smoking	Snus
Mean consumption of tobacco use in grams per week (mean (SD))				
Total	77.0 (53.4)	93.4 (77.6)	52.2 (53.8)	49.9 (55.7)
Daily	94.3 (46.0)	104.8 (75.4)	92.2 (46.3)	83.4 (60.8)
Occasionally	10.8 (12.6)	33.1 (59.2)	9.5 (12.7)	16.9 (19.9)
Duration of tobacco career (mean years (SD))				
Total	29.3 (11.8)	12.8 (10.8)	21.3 (10.9)	8.4 (9.1)
Daily	30.7 (11.3)	13.4 (11.1)	24.3 (10.8)	11.1 (10.1)
Occasionally	23.8 (12.3)	9.7 (8.3)	18.1 (10.1)	5.8 (7.1)
Number of quit attempts (mean (SD))				
Total	2.8 (4.6)	1.3 (3.0)	3.0 (6.0)	0.6 (1.9)
Daily	2.7 (4.1)	1.2 (2.5)	3.6 (7.9)	0.9 (2.2)
Occasionally	3.0 (6.1)	1.5 (4.7)	3.7 (4.4)	0.3 (1.6)

Note: Significant differences at $p < 0.005$ were found for all variables using both chi-square statistics and t tests (dependent and independent), except within dual users for mean consumption in grams per week for cigarettes and snus. ¹ Includes "currently attending school".

Table 2. Percentage of exclusive snus users, exclusive cigarette smokers and dual users who fully or partly agreed with statements about their personal snus and/or cigarette-smoking behaviour

	Between design			Within design		
	Exclusive smokers n=3401	Exclusive snus users n=885	Ratio $\frac{A}{B}$	Dual users n=566		Ratio $\frac{C}{D}$
	...on their smoking (A) % agree	...on their snus use (B) % agree		...on their smoking (C) % agree	...on their snus use (D) % agree	
Self-evaluative emotions $\alpha=0.92$ (smoking), $\alpha=0.91$ (snus)						
I am dissatisfied with myself because of my snus use/smoking	40.0	19.9	2.0	36.9	10.6	3.5
I am embarrassed because I am using snus/smoking	23.1	5.9	3.9	18.0	3.5	5.1
I have a bad conscience because I am using snus/smoking	45.6	20.3	2.2	45.2	9.0	5.0
I feel angry with myself because I am using snus/smoking	30.4	10.7	2.8	26.5	6.5	4.1
I feel guilty because I am using snus/smoking	30.3	11.2	2.7	29.0	5.3	5.5
I regret that I started to use snus/smoke	70.7	40.2	1.8	69.1	19.4	3.6
Moral judgements $\alpha=0.66$ (smoking), $\alpha=0.62$ (snus)						
Snus use/smoking is unethical	9.4	1.6	5.9	9.7	2.5	3.9
Snus use/smoking is disgusting	25.7	13.8	1.9	33.2	15.7	2.1
I try to hide my snus use/smoking when meeting people I do not know†	15.5	13.8	1.1	16.6	9.9	1.7
Social disapproval $\alpha=0.64$ (smoking), $\alpha=0.72$ (snus)						
Non-users of tobacco despise us who use snus/smoke	54.4	10.7	5.1	53.7	8.3	6.5
I feel that there is a strong social pressure to quit using snus/smoking	60.0	6.6	9.0	52.8	5.1	10.4
I feel that other people view my snus use/smoking as a personal weakness	27.4	8.7	3.1	28.4	6.7	4.2
Expected benefits from quitting $\alpha=0.77$ (smoking), $\alpha=0.70$ (snus)						
If I quit snus/cigarettes, my physical condition will improve	79.3	21.1	3.8	80.9	20.5	3.9
If I quit snus/cigarettes, the risk of getting CVD ¹ will be reduced	82.6	33.6	2.5	85.0	25.4	3.3
If I quit snus/cigarettes, I will become a better role model	61.0	54.8	1.1	60.8	30.6	2.0
If I quit snus/cigarettes, people around me will be more satisfied	53.6	12.7	4.2	50.7	7.6	6.7

Note: All differences between exclusive snus users and smokers were significant (Pearson Chi-square test) at $p<.001$ except †, $p=.199$. All differences within dual users were significant, $p<.001$. ¹ Cardiovascular diseases.

Table 3. Mean and test of differences (independent and dependent *t* tests) and effect size (Cohen's *d*) between exclusive smokers (n=3 401) and exclusive snus users (n=885), and within dual users (n=566) on evaluations of personal tobacco consumption.

	Cigarette use		Snus use		Effect size
	Mean	SD	Mean	SD	Cohen's <i>d</i>
Exclusive users					
Self-evaluative emotions	3.00	1.10	2.11	0.99	0.85
Moral judgements	2.35	0.86	1.90	0.78	0.54
Social disapproval	3.33	0.83	2.06	0.80	1.56
Benefits of quitting	3.92	0.79	2.71	0.85	1.47
Dual users					
Self-evaluative emotions	2.84	1.15	1.85	0.93	0.95
Moral judgements	2.39	0.90	1.93	0.81	0.54
Social disapproval	3.24	0.87	1.99	0.85	1.45
Benefits of quitting	3.91	0.89	2.53	0.95	1.50

Note: Indices constructed from PCA factors. Scale ranging from 1 (totally disagree) to 5 (totally agree). Significant differences were found for all factors both between exclusive users and within dual users, $p < .001$. The differences in mean scores remained significant between exclusive users after controlling for age and sex.

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