

**The Role of Psychological Dispositions in Explaining
Gender Differences in Snus Consumption: A Cross-
Sectional Survey Study of Norwegian Men and Women**

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Abstract

In Norway, the consumption of snus, a common smokeless tobacco product, appears to be characterised by marked gender and age differences. The clear majority of snus consumers are young and middle-aged men, while only a small percentage of younger women are using this product. The paper aimed at investigating to what extent these gender differences are related to gender role orientations (masculinity/femininity), and other psychological dispositions comprising hedonism, stimulation seeking, importance of appearance and importance of health, in a sample of Norwegians aged 18-40 years (N = 3,885). The results showed clear gender and age trends in snus consumption, with higher snus prevalence among men than women, and a general decline in snus consumption with age. Applying ordinal logistic regression analyses, masculinity, stimulation seeking and income were found to partially mediate the gender-snus relation, indicating that these variables could account for some of the gender differences in snus consumption. Moreover, hedonism was identified as a predictor of snus use behaviour, but did not operate as a mediating factor for gender and snus use in the sample. The present paper seem to be the first that quantitatively examines gender differences in snus consumption with the current psychological variables, and the paper can be considered a contribution to better understanding of psychological mechanisms underlying snus consumption. Implications for intervention work and future research are suggested.

Keywords: snus, smokeless tobacco, gender differences, masculinity, femininity, stimulation seeking, hedonism

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Introduction

Research on smoking and cigarettes has dominated the research field on tobacco consumption for several decades, and smoking has for instance been extensively studied regarding health effects, health costs, smoking prevention and psychological mechanisms underlying smoking behaviour (see e.g. Abrams, Leslie, Mermelstein, Kobus, & Clayton, 2003; Fielding, 1985; Tyas & Pederson, 1998). Snus, on the other hand, has not been studied to the same extent as smoking, since it is not a product that is used worldwide, but a form of tobacco only employed to a certain extent in the Nordic countries and some states in the USA (Bates et al., 2003). In recent years, however, the consumption of snus has escalated rapidly in the Nordic countries, notably in Norway (Helleve, Weisæth, & Lindbak, 2010) and Sweden (Lundqvist, Sandström, Öhman, & Weinehall, 2009), as well as in the United States where a version of snus was introduced to the market in 2006 (Biener & Bogen, 2009; Loukas et al., 2011). Snus is also being test marketed in large economies such as Canada and Japan (Carpenter, Connolly, Ayo-Yusuf, & Wayne, 2009; Hall & Gartner, 2009). Accordingly, research on snus and snus consumption is becoming increasingly important for establishing potential health effects and for surveilling the expansion of snus use. Snus research is also highly relevant for extending the understanding of both social and psychological developmental trajectories of snus consumption, and to identify possible measures of prevention and intervention work.

This paper opts to increase the knowledge on psychological aspects of snus consumption. More specifically, this study seeks to explore to what degree gender differences in snus consumption can be accounted for by gender role orientations and psychological dispositions associated with gender such as hedonism, stimulation seeking, importance of appearance and importance of health. The study sample comprises individuals between 18-40 years from a large nationally representative Norwegian study.

Snus has gotten a substantial amount of political and media attention concerning tobacco control, particularly in the last two decades. A ban on the sale and manufacturing of tobacco for oral use, not including tobacco that is smoked or chewed, was inserted in the European Union (EU) in 1992. The ban was established on account of studies from the International Agency for Research on Cancer, stating that smokeless tobacco was cancer inducing (EURLEX, 1992). Sweden negotiated an exempt from this ban in 1994 before joining the EU, due to snus having such a longstanding tradition in this country (Fagerström & Schildt, 2003; Lundqvist et al., 2009). Recently, the EU has been called upon to reconsider this ban (Fagerström & Schildt, 2003), due to high prevalence of smoking in the EU and

reports considering snus as a less harmful alternative to smoking. Strict regulatory standards on tobacco content are suggested instead of a ban, while it could also be questioned whether it is unethical to deny people a possibly less harmful tobacco alternative to smoking, when such a product in theory is available (Bates et al., 2003).

Smokeless tobacco

Tobacco is generally classified as either combustible tobacco (e.g. cigarettes) or non-combustible tobacco (e.g. snuff). The latter is frequently referred to as smokeless tobacco (SLT), and the consumption of SLT is prevalent across the globe in various cultures. SLT is, among others, common in the Nordic countries, certain parts of the USA, several South American countries, as well as different Asian and African countries including India, Saudi Arabia, Sudan and South Africa (Boffetta, Hecht, Gray, Gupta, & Straif, 2008; Lee, 2007; Warnakulasuriya, 2004).

SLT comprises a wide range of products. However, it can broadly be divided in two main types, namely chewing tobacco and snuff (Boffetta et al., 2008; Lee, 2007). Chewing tobacco is applied in the cheek, and nicotine is released through chewing. The product is non-ground, cut tobacco leaves, and manufactured as loose leaf, twist or plug. Snuff refers to dry snuff or moist snuff, which is ground or finely cut tobacco leaves that can be treated in a variety of ways, and used either nasally or orally depending on the type. Dry snuff is heat dried tobacco leaves that are ground and fermented, and this powder is inhaled through the nasal passage. Moist snuff is generally air- or fire-cured, finely ground tobacco leaves that are moistened, and placed behind the upper or lower lip when consumed. Most types of moist snuff are fermented and sometimes referred to as dipping tobacco, and this type of snuff can often cause the inconvenience of excess saliva in the mouth (Alpert, Koh, & Connolly, 2008; Boffetta et al., 2008; Warnakulasuriya, 2004).

Snus (Swedish-Style Snuff)

Snus is a type of spitless, moist snuff that originates from Sweden, and has traditionally been used there for centuries (Engström, Magnusson, & Galanti, 2010). Main ingredients in snus are ground tobacco leaves, water and salt, while moisture preservatives and flavours also are added. The snus product is placed between the gum and the upper lip and kept in the mouth for around 30 minutes, either portioned manually, or in pre-portioned sachets, commonly named “pouches” (Digard, Errington, Richter, & McAdam, 2009; Foulds, Ramstrom, Burke, & Fagerstrom, 2003). Nicotine is absorbed through contact with the oral mucous membranes and is steadily released into the blood stream. Due to high pH values, snus is thought to deliver nicotine more rapidly than other types of snuff. In addition, when it

comes to the quantity of nicotine delivered, snus seems to convey amounts of nicotine similar to that of cigarettes (Lunell & Lunell, 2005), and is considered highly addictive (Post, Gilljam, Rosendahl, Bremberg, & Galanti, 2010).

Snus was originally fermented, such as most other forms of moist snuff, but in the early 1980's heat-treatment replaced the fermentation process, resulting in snus products of today having a lower content of volatile nitrosamines than previously. This process of steam pasteurisation diminishes the amount of microorganisms, and is thereby associated with a lower risk of tobacco-specific nitrosamines (TSNAs) to develop in the product (Rosenquist et al., 2005).

Snus and Health Effects

Concerns about the health effects of snus consumption has particularly been associated with the content of TSNA in this product. TSNA is a class of chemical compounds that are claimed to be carcinogenic, meaning substances that are associated with cancer induction (Hecht, 1998; Stepanov et al., 2012). Still, the role of these compounds in inducing cancer in humans using moist snuff needs further examination (Hecht, 1998). TSNAs are known to develop in tobacco products during curing and fermentation processes (Spiegelhalder & Bartsch, 1996), and can also significantly increase during storing at room temperature (Djordjevic, Fan, Bush, Brunnemann, & Hoffmann, 1993). Snus is stored in refrigerators by manufacturers and retailers, as opposed to moist snuff traditionally produced in the USA which is normally stored at room temperature (Foulds et al., 2003). This may also affect the difference in TSNA content that has been found between the two types (Djordjevic, Brunnemann, & Hoffmann, 1993). Snus manufacturers in Sweden have actively tried to reduce the TSNA content in their products and appear to have succeeded (Österdahl, Jansson, & Paccou, 2004). Even though the TSNA content in snus seems to be low, it is highly important to consider the fact that snus products contain these cancer provoking compounds.

Associations between severe health consequences and snus are less pronounced than for smoking, and not clearly demonstrated (see e.g. Lee, 2011). In fact, SLT low in TSNA content such as snus is suggested to have at least 90 percent fewer associations with negative health effects, compared to smoking cigarettes (Levy et al., 2004). However, some studies have found associations between snus consumption and severely damaging health effects. One retrospective study on men in Sweden found an association between snus and cancer in the pancreas (Luo et al., 2007), while another Swedish study found long-term snus use to be related to an increased risk of dying from cardiovascular and cerebrovascular disease (Bolinder, Alfredsson, Englund, & de Faire, 1994). Moreover, one literature review on snus

and health effects with studies from northern Europe found associations with oesophageal and pancreatic cancer, but emphasized that these studies had few cases (Boffetta et al., 2008). Even though some studies have found associations between snus and severe illness, notably cancer, many of these studies have been criticised on methodological grounds, such as limited control of confounding variables. A review of previous research on snus, including meta-analyses from studies in Norway, Sweden, Finland and Denmark, suggests that there is no support for snus consumption being associated with increased risk of any type of cancer (e.g. cancer in the oesophagus, oropharynx, stomach, pancreas or lungs). Furthermore, the same review concluded that there were no relation between snus and heart disease, nor stroke (Lee, 2011). Several other reviews support this lack of associations on snus and cancer (see e.g. Foulds et al., 2003; Lee & Hamling, 2009).

Nevertheless, studies on snus consumption have established associations between less severe health effects and afflictions such as changes in the mouth in form of oral lesions and gingival infections (Axell, 1993; Foulds et al., 2003). Moreover, use of snus is suggested to be related to increased weight and incidence of obesity in men (see e.g. Hansson, Galanti, Magnusson, & Hergens, 2011), along with increased risk of type 2 diabetes (Persson et al., 2000), and of metabolic syndrome (Norberg, Stenlund, Lindahl, Boman, & Weinehall, 2006). Other possible negative health effects such as preterm delivery and low birth weight, ulcerative colitis and Crohn's disease are neither clearly established, nor discarded (see Foulds et al., 2003; Lee, 2011).

All in all, it appears as though the potential adverse health effects from snus consumption directly are moderate. However, snus clearly has damaging health effects and more research is needed to obtain conclusive results, especially on the more severe health disorders that snus may attach. The uncertainty about snus and health effects combined with the continuous spread of this tobacco product in the population emphasise the importance of understanding all aspects of this tobacco product, particularly the mechanisms underlying snus consumption behaviour.

Tobacco Prevalence

A report on tobacco consumption in Norway presented by The Norwegian Directorate of Health shows the prevalence of snus and cigarette consumption in the population between 16-74 years in 2008-2009 (Helleve et al., 2010). The report also describes the development of tobacco consumption in the population from 1973 to 2009, based on yearly data collected by Statistics Norway. Numbers from this report are presented below.

Snus prevalence in Norway. Table 1 shows snus consumption daily and sometimes

from 2008-2009 for respondents aged 16-74 years. The numbers are characterised by marked gender and age variations. Six percent of the population between 16-74 years used snus on a daily basis, with a considerably higher prevalence among men (11.0 %) than women (1.0 %). The youngest cohort of males (16-24 years) constituted the group with the largest reported usage of snus (19.0 %), while the usage for females in the same age group was considerably lower (6.0 %). However, this young cohort of females was clearly the only one where snus consumption was prevalent to a certain degree among females. Closer inspection of the youngest age cohort of males revealed that this group reported more daily snus consumption (19.0 %) than daily smoking (16.0 %). In general, snus consumption was most common among males between 16-44 years (Helleve et al., 2010).

Table 1

Percentage of Snus Consumption (Daily and Sometimes) for Men and Women (16-74 Years) in Norway. The Data are Merged from 2008-2009 and the Table is Adapted from the Norwegian Directorate of Health's Report (Helleve et al., 2010).

Snus Prevalence	Age Groups						Total
	16-24	25-34	35-44	45-54	55-64	65-74	
	%	%	%	%	%	%	%
Daily							
Men	19.0	18.0	15.0	7.0	4.0	2.0	11.0
Women	6.0	1.0	1.0	1.0	0.0	0.0	1.0
Total	12.0	9.0	8.0	4.0	2.0	1.0	6.0
Sometimes							
Men	12.0	10.0	7.0	4.0	2.0	1.0	6.0
Women	10.0	4.0	2.0	1.0	1.0	0.0	3.0
Total	11.0	7.0	4.0	2.0	2.0	1.0	4.0
Sample (n)	1,296	1,438	1,938	1,823	1,543	969	9,039

The same report also indicates that there seems to have been a substantial increase in the number of male snus users between 16-24 years from the late 1990s, stabilizing just below 20.0 percent after 2006. For females in the same age cohort the amount of snus consumers increased considerably from 2006 until 2009 (Helleve et al., 2010). Furthermore, numbers reported from the Norwegian Institute for Alcohol and Drug Research (2011) indicate a marked increase in the sale of snus from 336 tons of snus sold in 1997 to 1199 tons of snus sold in 2011. The increase in the amount of snus sold these years is to a certain degree coinciding with the increase in snus consumption during these years (Helleve et al., 2010). While the sale of other forms of tobacco is decreasing in Norway, snus is reported to be the only tobacco product with increasing sales (Åstrøm, Bui, Læknes, Johannessen, & Gjerdet,

2007). At the moment, snus is the most common type of SLT applied in Norway (Øverland, Tjora, Hetland, & Aarø, 2010).

The late increase in snus consumption might be due to several factors. A public smoking ban (including restaurants, bars and the like) was introduced in Norway the 1st of June 2004, to protect service personnel and the public in general (Eagan, Hetland, & Aarø, 2006). Accordingly, snus can be a convenient means of nicotine deliverance where smoking is not possible. As commented above, snus also seems to be less harmful to the health than smoking, and has become a popular product for quitting smoking, especially among men (Lund, McNeill, & Scheffels, 2010; Lund, Scheffels, & McNeill, 2011). Although, the transition from smoking to using snus might be feasible for numerous smokers, there is great dispute and concern that this fashion of quitting the addiction of smoking just relocates the problem and translates into an addiction of snus instead. Snus as a means of quitting smoking has been subject to a heated debate in the literature, and labeled as a “harm reduction approach”. In this instance the research community is divided as to whether such a harm reduction approach would reduce or fuel the tobacco epidemic (see e.g. Ayo-Yusuf & Burns, 2012; Gartner, Hall, Chapman, & Freeman, 2007; Savitz, Meyer, Tanzer, Mirvish, & Lewin, 2006; Timberlake & Zell, 2009; Twombly, 2010). Due to the potential of snus as a means to interfere with the high prevalence of smoking, further knowledge and research on snus are highly relevant and crucial, especially on a society level.

Smoking prevalence in Norway. As described above, snus is mostly used among young and middle aged men in the Norwegian population. These clear gender and age tendencies do not seem to be reflected in other forms of tobacco consumption. Numbers on the prevalence of cigarette consumption daily and sometimes for respondents aged 16-74 years from 2008-2009, do not indicate any pronounced gender differences in the population (Helleve et al., 2010). Twenty-one percent of the Norwegian population between ages 16-74 reported smoking daily, which is much higher than the prevalence of daily snus consumption in the population. Nevertheless, there are some age differences when it comes to daily smoking. The cohorts that report the highest smoking prevalence are those between 45-54 years (25.0 %) and 55-64 years (24.0 %), while the youngest part of the sample (16-24 years), and the oldest part (65-74 years), both report 16.0 percent smoking prevalence, and constitute the cohorts with least distribution of daily smoking. The prevalence among 25-34 year olds was lower than the population average (18.0 %), and the age group 35-44 years had a prevalence percentage reflecting the population average (21.0 %) (Helleve et al., 2010). Contrasted with snus in the population, which is mainly used by younger men, smoking seems

to be most common among middle-aged men and women, while the youngest part of the population smoke considerably less on a daily basis than the population average.

The prevalence of smoking in Norway is slightly lower than the average estimate of daily smokers in the EU countries, which is at approximately 25.0 percent (see Bogdanovica, Godfrey, McNeill, & Britton, 2011 for a review on smoking prevalence in the EU). However, Sweden has been in an exceptional position when it comes to tobacco prevalence the last decades. Numbers from 2002 indicate that daily smoking prevalence was low for men (13.0 %) relative to numbers in other European countries, while the daily snus prevalence was high (20.0 %). Moreover, the smoking prevalence for Swedish women was higher than for men (19.0 %), while female daily snus use was relatively uncommon (2.0 %) (Ramström & Foulds, 2006). Sweden's unique position in Europe with an unusually low smoking rate and a high rate of snus use among men, has been subject to a great deal of research to examine the possible effects of such a high prevalence of snus use relative to cigarette consumption. As a result of the low prevalence of smoking among men, Swedish men have exceptional low rates of smoking-related mortality (Rodu & Cole, 2004) and have been subjected to a marked reduction in smoking-caused disease in the last decades (Foulds et al., 2003). In this regard, contrasting cigarette and snus consumption in a population perspective, can give some indications on important aspects of snus, such as the relative harm of snus consumption compared to cigarette consumption in the population. Updated numbers on tobacco diffusion in Sweden show that daily cigarette consumption for men now is even lower (10.0%), while there has been a marked decrease also for women (12.0 %). The prevalence of snus consumption has decreased for men (18.0 %) and increased for women (3.0 %) (The Swedish National Institute of Public Health, 2011). Snus has been widespread in Sweden for more years than in Norway. Due to close cultural and traditional practices between Sweden and Norway in numerous respects, Swedish tobacco prevalence at present could be modeling future tobacco prevalence in Norway. This is interesting in a Norwegian perspective, if snus consumption actually can contribute to a decrease in smoking prevalence and tobacco related disease and mortality the population.

Theoretical Framework and Previous Research

Even though snus consumption has spread considerably in recent years, also outside of the Nordic countries, there seem to have been limited focus on the psychological part of snus behaviour and developmental trajectories of snus consumption (Engström et al., 2010; Nordby & Wood, 2008; Rosendahl, Galanti, & Gilljam, 2008). Moreover, prevalence of snus is increasing among young people especially, but the mechanisms behind this trend remain

nearly unexplored (Wiiium & Aarø, 2011). Research on snus behaviour to this date, has for the most part been centered around the physiological effects of snus and negative health associations (Nordby & Wood, 2008), indicating the necessity of more research on psychological aspects of snus consumption.

It is assumed that snus consumption is affected by a range of social and psychological factors. Social factors particularly important for snus use could for instance include health policies (e.g. information on health effects, prize, the placement of snus in stores and marketing) along with traditions and norms regarding snus consumption in the society, while psychological factors that may influence snus use are inherent in the individual (e.g. assessing intentions and consequences of snus use, or personality traits) (Aarø, Lund, Vedøy, & Øverland, 2009). Social and psychological aspects of snus consumption are most likely influencing each other, and research on both aspects is highly relevant to understand the mechanisms underlying snus consumption. As presented above, gender seems to be an important predictor of snus consumption, while age also to a certain degree appears to predict snus use for both males and females.

This study aspires to uncover psychological factors that might be associated with the fact that there are more men than women using snus. In particular, it explores to what extent psychological dispositions contribute to the association between gender and snus consumption. Some of the psychological dispositions selected for this study were chosen on the grounds of previous research, while other dispositions were chosen because they are theoretically plausible psychological explanations for the relationship between gender and snus consumption. The relevant psychological dispositions in this study include 1) gender roles measured by masculinity and femininity; 2) hedonism and stimulation seeking; and 3) importance of appearance and importance of health. These will be commented on consecutively, and it is thought that women and men on average can score differently on these dispositions.

Gender roles. In sociology, “gender roles” is a term that broadly refers to a comprehensive set of norms and expectations in the society and culture according to one’s gender (Murnen & Smolak, 2010; Ruch, 1984). Consequently, men are expected to be intellectual, athletic, instrumental and aggressive, while women meet expectations of being intuitive, emotional, nurturing and passive (Ruch, 1984, p. 99). In a psychological context, the terms “gender identity” or “gender role identity” are often applied to refer to internalised perception of gender roles, so that having a “masculine” identity is rooted in internalised meanings from associations of the male role, and consequently, having a “female” identity is

rooted in internalised meanings from associations of the female role (see Burke, Stets, & Pirog-Good, 1988). Clearly defined psychological definitions of masculinity and femininity are lacking (Hoffman, 2001). Nevertheless, masculinity and femininity are often conceptualised as characteristics that are socially desirable in both men and women, but masculinity characteristics are supposedly more typical for men than women, and femininity characteristics are to a greater extent believed to be more typical for women than for men (Bem, 1974; Helgeson, 1994).

Early on, masculinity and femininity were thought of as a single continuum with masculinity in one end and femininity in the other, so that there was no possibility of having distinct scores on both concepts at the same time (Bem, 1974). However, these absolute ideas on the concept of gender roles and a necessarily inverted relationship between masculinity and femininity have been challenged and are to a certain degree considered obsolete (Campbell, Gillaspay, & Thompson, 1997; Constantinople, 1973). More modern theories postulate that masculinity and femininity are separate constructs that can vary independently. In this manner, men and women can have scores on both constructs which makes it possible to address the individual's relationship between masculinity and femininity. This approach also paved the way for research on androgyny, which depicts an individual that engages in both masculine and feminine behaviour unrestrictedly (Bem, 1974). To date, various scales have been used to measure gender roles such as The Stereotype Questionnaire (Rosenkrantz, Bee, Vogel, Broverman, & Broverman, 1968), The Bem Sex-Role Inventory (Bem, 1974), and the Personal Attributes Questionnaire (Spence, Helmreich, & Stapp, 1975).

Gender roles, gender identity and the concepts of masculinity and femininity seem to be very complex and elusive structures. Moreover, populations are shifting according to societies and cultures in continuous movement and alteration, which may lead to population changes in the scores on gender measures (see e.g. Twenge, 1997). These issues pose challenges in developing accurate and satisfactory measures of masculinity and femininity, and gender role scales have to a certain extent been criticised for not having operationalised the constructs of masculinity and femininity properly (see e.g. Constantinople, 1973), and also for being gender stereotyped (Pedhazur & Tetenbaum, 1979). Accordingly, how to measure and define masculinity and femininity adequately has been the center of great debate for decades and is still an ongoing discussion, but this subject is beyond the scope of the present paper (see e.g. Constantinople, 1973; Helgeson, 1994; Hoffman, 2001). Even though there has been ongoing controversy as to how masculinity and femininity should be defined, scales measuring these constructs have operationalised masculinity through adjectives such as

aggressive, forceful, independent, competitive, assertive, and, self-confident. In the same manner, femininity has been operationalised with adjectives including understanding, compassionate, emotional, kind, tender, and gentle (Bem, 1981; Spence et al., 1975).

Research concerning snus and masculinity/femininity appears to be rare, and very few studies directly examining snus consumption and gender roles were found. However, three qualitative studies from Sweden were related to this topic. In one study on smoking cessation methods among middle aged and elderly women, the women in the study referred to snus as “unfeminine”, and snus was not regarded as an attractive smoking cessation aid for this group (Lundqvist, Weinehall, & Öhmann, 2007). In another study on adolescents, both boys and girls had notions of snus as “unfeminine” and typical for male behaviour, and associated snus use to conventional male fields such as hunting and ice-hockey (Stjerna, Lauritzen, & Tillgren, 2004). A third study in the Swedish ice-hockey environment suggested that snus consumption might be an expression of the masculine attitude linked to this sport, but generalizations from the study cannot be drawn to the population in general (Rolandsson, Hallberg, & Hugoson, 2006). Nevertheless, snus use seem to be more common among adolescent ice-hockey players than it is among adolescents in Sweden in general (Rolandsson et al., 2006; Rolandsson & Hugoson, 2003), and more research on snus in this masculine-oriented environment would be of interest. In the USA, moist snuff has been associated with rural masculine ideals for decades. However, with emerging versions of moist snuff such as snus, which is spitless and considered more hygienic, snus has spread to a younger, higher educated and more urban audience, though the masculine associations to this type of tobacco seem to persist (White, Oliffe, & Bottorff, 2012). This might also apply to Norway, where snus is mainly consumed by men, but with no clear educational pattern (Helleve et al., 2010). Summarised, the topic of snus use and masculinity has briefly been commented on in some qualitative studies, but there is a lack of quantitative approaches examining this topic, giving further importance to the present study. It is hypothesised that snus consumption can be associated with masculine orientations and that an individual’s masculinity is confirmed through snus use. Accordingly, masculinity might predict snus consumption and explain some of the gender difference in the use of this type of tobacco. Furthermore, that femininity could act as a protecting factor against snus consumption, with feminine orientations being less compatible with snus consumption than masculine orientations, and explain part of the gender difference, is also a possibility.

Stimulation seeking and hedonism. Stimulation seeking is conceptualised as the need for satisfaction through excitement, novelty and challenges, and can incorporate daring or

risky behaviour to fulfill this need (Schwartz, 1992; Zuckerman, 1979). In the literature the terms stimulation seeking and sensation seeking are both used to describe similar needs. The search for stimulation/sensation has been found to be higher for males than females (Schwartz & Rubel, 2005; Zuckerman, 1979), and to gradually decline with age after adolescence (see e.g. Zuckerman, 1979). Moreover, stimulation seeking aspects of snus use could possibly be important for the initiation of snus use behaviour (Nordby & Wood, 2008), perhaps particularly in adolescence. Accordingly, stimulation seeking might be associated with both gender and age differences in snus consumption. In a qualitative study on Norwegians between 18-38 years, consumption of snus was associated with achieving a certain affect. Snus was identified as a measure to alter the mood state, but also for stimulation or arousal needs. Moreover, the use of snus was often related to specific times (for instance after a meal) or in certain contexts with lack of stimulation (being bored or aimlessly sitting in front of the TV) (Nordby & Wood, 2008).

Furthermore, risky behaviour, which can be an extensive part of stimulation seeking, involves choices that can lead to possibly negative consequences, such as negative health effects as a consequence of snus consumption. It appears as though males in general are more likely to engage in risky behaviour than women (Byrnes, Miller, & Schafer, 1999), which also might account for gender differences in snus consumption. One study on Swedish adolescents found that risk behaviour in form of weekly alcohol intake for 13-year-old boys was associated with a greater likelihood to be affiliated with groups of early snus escalation (Rosendahl & Galanti, 2010). In short, it seems as though snus consumption can be used to meet stimulation needs in different ways depending on the context and the individual. For instance, to use snus when being bored, or to use snus even though one is aware of possible negative health effects. It is thought that stimulation seeking may function as a predictor of snus consumption and potentially could account for gender and age patterns in snus use, seeing as stimulation seeking in general has been shown to be higher among males, and decline with age.

Hedonism is related to stimulation seeking aspects, and involves the need for sensual satisfaction, own pleasure and enjoyment (Schwartz, 1992). Although in this regard, pleasure does not necessarily involve new, challenging or risky behaviour as it does in stimulation seeking. Similar to stimulation seeking, hedonistic values have also been shown to be more important for men than women (Schwartz & Rubel, 2005). Two previous studies mentioning properties of snus that can be interpreted as hedonistic were found. In a sample of Norwegian students reporting attitudes towards snus use the following six months, 14.5 percent of the

men reported snus as being “comfortable”, while the percentage for women was 2.1. Furthermore, 13.0 percent of the men also classified snus as being “satisfying”, while 2.5 percent of the women reported the same (Åstrøm et al., 2007). In interviews with young Norwegians, a qualitative study identified snus as a means to feel relaxation (Nordby & Wood, 2008). It seems as though snus use potentially could meet hedonistic needs for certain individuals, especially for men, while men also are known to emphasise hedonistic values more than women. Accordingly, it is hypothesised that hedonism could be a mechanism underlying gender differences in snus consumption, and be a predictor of snus consumption.

Importance of appearance and importance of health. Varying degrees of paying attention to own appearance may also be associated with snus use. Gender differences in snus consumption could partly be due to differences in emphasis on physical appearance. Women are in general more concerned with physical appearance and attractiveness, than men (see Burton, Netemeyer, & Lichtenstein, 1995; Crocker, Luhtanen, Cooper, & Bouvrette, 2003). In one study on Norwegian university students, women attributed more negative characteristics to snus users than men (e.g. bad breath, ugly teeth, and limited charm), while men associated snus users with positive characteristics more often than women (e.g. work in the military, are doing sports, and are trying to quit smoking) (Åstrøm et al., 2007). It seems as though using snus is less appealing for women than men, perhaps due to snus being a visible part of the appearance in a different way than smoking cigarettes (e.g. a visible bulk under the lip and teeth stains), and due to unhygienic features of snus consumption (e.g. spitting or lurking the tobacco out with the finger after use). Also, difference between the genders when it comes to snus type preferences illustrates some of these aspects. In the same study on a group of Norwegian students that was mentioned above almost all the women used pre-portioned snus sachets (88.0 %), which are more hygienic and less visible, while the use of manually portioned snus among women was rare (1.0 %). The distribution was different for men where manually portioned snus was the most common (52.0 %) and snus sachets were less prevalent (29.0 %) (Åstrøm et al., 2007). Likewise, another study on Norwegian adolescents reported more prevalence of snus sachets among girls than boys (Øverland, Hetland, & Aarø, 2008b). Furthermore, one study examining trends in tobacco consumption among a sample of Norwegian adolescents found that both males and females perceived snus as unattractive, but females more so than males. Moreover, females regarded snus use as less trendy than males, while the perception of snus consumption as trendy also increased with age for males. In general, both male and female snus users had a tendency to regard snus use as being more attractive than non-snus users, while snus-users and non-snus users to a certain degree

perceived snus to be trendy. Accordingly, perceived trendiness and subjective attractiveness of snus were significant predictors of snus use (Wiium, Aarø, & Hetland, 2009).

Snus consumption might also be associated with other aspects of appearance, such as weight control, much like smoking has been used for dieting, particularly among women (see French & Jeffery, 1995). Expectancies of snus as a weight control measure were found in a sample of Norwegian students, but males interestingly reported snus as a means of weight control to a higher degree than females (Åstrøm et al., 2007). All in all, perceptions of snus and its aspects related to physical appearance might predict snus use, and partly account for the gender differences in snus consumption. More specifically, lower levels of snus consumption among individuals that more strongly value own appearance is expected.

Furthermore, an individual's valuing of own health along with assessments of the health risks associated with snus consumption, might affect the probability of initiating snus use behaviour. A study on expectancies related to snus consumption as predictors of intentions to use snus, suggested that negative expectancies of health risks related to snus use were significant predictors of snus use intentions in a sample of Norwegian university students (Larsen, Rise, & Åstrøm, 2011). However, some gender differences have been found regarding perceived health effects of snus use. In a study on American adolescents, female snus users regarded snus as more health threatening than male snus users, whereas non-snus users did not reflect this gender difference and reported similar levels of health threat beliefs (Loukas et al., 2011). Moreover, women considered snus as a health risk to a greater extent than men in a sample of Norwegian students (Åstrøm et al., 2007). Another study on Norwegian adolescents found girls on average to rate snus as more harmful than boys, but whether these differences reflect general gender differences in risk perception, or if it applies to different harm perception of snus between the genders in particular, remain unclear (Øverland, Hetland, & Aarø, 2008a). Some studies also indicate that women generally engage in health promoting behaviour and value own health more than men (see Courtenay, 2000; Kristiansen, 1990; Ratner, Bottorff, Johnson, & Hayduk, 1994). Summarised, differences in health consciousness and the perception of health risks associated with snus, might predict snus use, and explain part of the gender variances in snus consumption, seeing as women generally to a higher degree seem to attach health risks to snus.

Snus and socio-economic patterns. Factors comprising educational level, income, and the like are important to consider when performing analyses on health behaviour. These variables can indicate the socio-economic level of the respondents, and might be associated with variables in the analyses. Several studies point to individuals with lower socio-economic

status in the Western world being more likely to engage in negative health behaviour such as smoking (Huisman, Kunst, & Mackenbach, 2005), and excessive alcohol consumption (Huckle, You, & Casswell, 2010).

Results from previous studies on snus and socio-economic markers are mixed. One study among a sample of 15-16 year old adolescents in Norway found snus consumption to be negatively associated with educational ambitions, while having a single parent also was related to higher snus prevalence for both boys and girls (Grøtvedt, Stigum, Hovengen, & Graff-Iversen, 2008). Another study found higher prevalence of snus consumption among Swedish men with a low educational level than men with a high educational level, and higher snus prevalence in men with intermediate levels of income than in other income groups. For women, snus use was more common in individuals with an intermediate educational level, compared to a high educational level, but no clear associations with income were found (Engström et al., 2010). Moreover, one study from Norway found that the percentage of snus consumption (including snus consumption daily and sometimes) was remarkably higher among female university students (12.0 %) than among females not pursuing higher education in the same age group (3.8 %), while for men there was a slight, but non-significant reversed tendency (Lund, Tefre, Amundsen, & Nordlund, 2008). However, snus consumption was not found to be a marker of low socio-economic conditions in another Swedish study, especially not for women (Rosendahl et al., 2008), while a study on Norwegian adolescents did not find any associations between socio-economic status and snus use (Øverland et al., 2010). The report on tobacco consumption from the Norwegian Directorate of Health also concludes that there are no clear associations between daily or occasional snus consumption, and level of education (Helleve et al., 2010). All in all, the studies above suggest some faint gender differences in relations between socio-economic markers and snus use, with possible associations between lower educational level for men in general, while there might be an association between snus consumption and higher educational level for certain groups of higher educated women. Lower or higher level of income does not seem to predict snus consumption for men nor women. Consequently, educational level might predict snus use with higher snus consumption among lower educated men, than higher educated men. For women, an association between snus consumption and higher education might be present.

Aims of the Study

The main purpose of the present study is to investigate to what extent gender differences in snus consumption are related to psychological dispositions associated with gender. The first step is to describe the age and gender distribution of snus consumption in the

current sample, and to assess whether any pronounced age and gender differences regarding snus consumption are present. A decrease in snus consumption with age, with the highest prevalence among the youngest age groups and very low prevalence among the older female age groups in particular, are expected to be found. Secondly, possible age and gender differences in cigarette consumption are examined. Smoking patterns are investigated to determine whether patterns in snus consumption in the sample can be considered distinguishably different from those in smoking. Here, no gender differences in smoking are anticipated, but some age patterns may occur, with higher smoking prevalence among older respondents in the sample. The third step explores the extent to which gender role-specific behaviour measured by masculinity and femininity can be potential explanations for possible gender differences in the sample. Masculinity in particular is expected to account for gender differences in snus consumption. Finally, the study aims to understand if the personal dispositions of hedonism and stimulation, and importance of appearance and health can affect a possible association between gender and snus consumption. All four dispositions are expected to influence a gender-snus relation.

Materials and Methods

The Life Course, Generation and Gender Study

The data being used in the present study was derived from The Life Course, Generation and Gender Study (LOGG), which is a large scale study performed by Statistics Norway (SSB), in collaboration with Norwegian Social Research (NOVA). LOGG consists of two corporate studies; the first round of the Norwegian Generations and Gender Survey (GGS-Norway), which is part of the Generations and Gender Programme, a United Nations research project on generation and gender equality, and the second round of the Life course, Ageing and Generation Study (NorLAG2) (Bjørshol, Høstmark, & Lagerstrøm, 2010).

LOGG is designed as a longitudinal study, with data obtained from public registers, a telephone interview and a postal questionnaire and comprises a nationally representative sample of respondents between ages 18-79. The sample was stratified according to age, gender, country sector, and centrality of residential municipality, and the gross sample of LOGG counted 24,830 respondents. The telephone interview was conducted first, and the postal questionnaire was only sent to respondents that completed the telephone interview. For the telephone interview alone, the response rate was 60.0 percent (N= 14,892). Furthermore, 72.5 percent (N= 10,794) of the respondents participating in the telephone interview answered the 16-page postal questionnaire that was sent to them following the interview. When comparing the difference between the gross and the net samples of the telephone interview and the questionnaire, respondents aged 18-39 seemed to be somewhat under-represented, particularly men, along with respondents aged 70-79 years, while respondents between 40-69 years were slightly over-represented. Moreover, respondents with lower education were considerably under-represented, while respondents with university or college education were over-represented. Also, minor biases in respondents between country sectors were observed. The total response rate of LOGG including the telephone interview and the questionnaire was 43.5 percent (see Bjørshol et al., 2010 for more detailed information on LOGG).

The present study will focus on respondents of LOGG between 18-40 years, due to generally low prevalence of snus consumption among the older population, and merely data from the postal questionnaire of LOGG and public registers are used in the current study.

Ethical Considerations

Participation in the study was based on informed consent. All the potential respondents in the study received a letter and a leaflet by post with information regarding the nature and intention of the study, as well as information on which individual survey data that could be linked with data from public registers (Bjørshol et al., 2010).

The data collection was conducted by Statistics Norway and all the interviewers had to complete a training course. They were given a thorough introduction as to how the interview was to be carried out, how to manage sensitive or demanding questions in the interviews, along with general strategies of conduct towards the respondents. The study was approved by The Data Inspectorate, and the protection of the privacy of the respondents was insured by Statistics Norway according to established regulations. Researchers are only given admission to de-identified data on the grounds of specified research projects and after having signed a confidentiality agreement administered by the Norwegian Social Science Data Services (Bjørshol et al., 2010).

Instruments

Tobacco consumption. Data on snus and cigarette consumption were of main interest in this paper and constituted the dependent variables in the analyses. The question on tobacco consumption, which was part of the postal questionnaire, was phrased as following: "Do you use, or have you used any of the following types of tobacco/nicotine?", with the alternatives "cigarettes", "snus", "other types of tobacco", "nicotine chewing gum", and "other nicotine products". Each product was rated by five ordinal response categories including "before, but not now" (coded as 1), "never" (= 2), "rarely" (= 3), "sometimes" (= 4) and "daily" (= 5). Additionally, number of units per day for each tobacco/nicotine product was reported (see Appendix A for the original questions). In order to obtain a measure of tobacco consumption that represented the actual year of the survey, respondents answering "before, but not now" were merged with respondents reporting "never". This was done for both the snus and cigarette questions.

Demographical data. Relevant demographical data in the present study covered mainly the respondents age at the time of the interview, gender (female = 1, male = 2), and income. Additionally, the respondent's level of education was obtained and classified by the five categories "primary and secondary school" (coded as 1), "basic upper secondary school" (= 2), "completed upper secondary school" (= 3), "university or college education for 1-4 years" (= 4), and "university or college education for 5 years or more" (= 5). All these demographical data served as explanatory variables in the analyses and were collected from public registers.

Masculinity and femininity. A short version of The Bem Sex-Role Inventory (BSRI) was used to measure masculinity and femininity in the sample (Bem, 1981), and the postal questionnaire was the source of these data (see Appendix B for the original questions). The BSRI is one of the most applied scales for measuring gender role orientations in psychology

and other areas (Hoffman, 2001; Holt & Ellis, 1998), and the masculinity and femininity items are thought to measure masculine and feminine characteristics that are socially desirable (Bem, 1974).

Originally, the short version of the BSRI included 30 items, where ten measured masculinity, ten measured femininity and the last ten were filler items. However, only twelve items from this scale were selected to be included in LOGG, after having performed several pilot tests on the scale, indicating that the masculinity and femininity items were associated with desirable properties for men and women respectively, in different Norwegian samples. The six items characterizing masculinity were "aggressive", "has leadership abilities", "defends own beliefs", "willing to take risks", "assertive" and "forceful". The six feminine items were "understanding", "compassionate", "eager to soothe hurt feelings", "sympathetic", "tender" and "sensitive to the need of others". Moreover, the survey used a five-point rating scale with graded response categories ranging from "not corresponding at all" (= 1) to "fully corresponding" (= 5), while the BSRI originally employs a seven-point rating scale. The scale classifies the informants as either masculine, feminine, androgynous (constituting high scores on both masculinity and femininity) or undifferentiated (a low score on both masculinity and femininity) (Bem, 1981; Hansen & Herlofson, 2007). However, the present study did not concern androgyny, but was entirely focusing on masculinity and femininity. Mean scores on the scales were computed, where higher scores indicated a high degree of masculinity and femininity, and lower scores indicated a low degree of masculinity and femininity.

The BSRI has been criticised methodologically for its construct validity in the manner of not measuring masculinity and femininity adequately and for underestimating the complexity of these constructs (Choi & Fuqua, 2003). In addition, some of the literature advocates a three factor solution for the scale, with one femininity and two masculinity factors, for both the long and the short version of the BSRI. Consequently, it has been suggested that masculinity should be divided in one factor labeled "social masculinity" (e.g. aggressive), and one factor labeled "personal masculinity" (e.g. has leadership abilities) (see Choi, Fuqua, & Newman, 2009). Even though the BSRI has been widely discussed and criticised (Hoffman & Borders, 2001), it is still a highly applied scale, and research suggests that the short form of the BSRI often provides more reliable scores than the original long form (Campbell et al., 1997; Choi et al., 2009). Furthermore, a partial replication of Bem's (1974) initial validation method of the masculine and feminine items suggests the scale's validity for measuring gender roles (Holt & Ellis, 1998).

Since the BSRI to a certain extent is considered to be a controversial measure, the

scale's validity and reliability was thoroughly evaluated in the current study (see the "Results" section).

Hedonism and stimulation seeking. In the present study, Schwartz' Portrait Values Questionnaire (PVQ) was applied to measure "hedonism" and "stimulation seeking" (Schwartz et al., 2001). The PVQ originally comprises 40 items, but the LOGG study applied a short form of the PVQ designed for the European Social Survey (ESS)¹ that consists of 21 items (Davidov, Schmidt, & Schwartz, 2008; Hansen & Herlofson, 2007). Pilot studies of the short form indicated sufficient reliability and validity (Schwartz, 2001). Still, more recent studies have debated its cross-cultural validity (see Davidov et al., 2008; Knoppen & Willem, 2009; Verkasalo, Lönnqvist, Lipsanen, & Helkama, 2009). Moreover, LOGG used a shorter text with one phrase for each item and gender neutral item formulations as opposed to the ESS scale, which applied two phrases per item, and specific formulations for men and women on each item. These alterations are thought to better adapt the scale to fit the Norwegian society, and are in accordance with Schwartz' suggestions to vary items in order to fit a cultural context (Hansen & Herlofson, 2007; Schwartz, 2001).

Four items from the short form of the PVQ scale were derived to assess the sample according to "hedonism" and "stimulation seeking", and these data were obtained from the postal questionnaire (see Appendix D). Hedonism is thought to be motivated by pleasure or perceptual gratification, hence, stimulus that gives the opportunity to feel enjoyment in one's life (Schwartz, 1992). Two items, "It is important to this person to enjoy life and spoil oneself" and "It is important to this person to have fun", were used to measure "hedonism". The Cronbach's alpha value for the two questions was .63, while the correlation between the two items was $r = .46$.

Stimulation seeking is described as human needs for stimulation and arousal, with motivational goals such as novelty, excitement and challenge in life (Schwartz, 1992). Two items assessed the respondents in terms of valuing "stimulation"; "It is important to this person to do many new things in life" and "It is important to this person to live an exciting life and take risks". These two questions had a Cronbach's alpha value of .72, and a correlation coefficient of $r = .56$.

The four items measuring hedonism and stimulation seeking were graded by a six-point rating scale with response categories from "not at all like me" (= 1) to "very much like me" (= 6). Furthermore, mean scores were calculated for the two hedonism items and the two

¹ See <http://ess.nsd.uib.no/> for information on the European Social Survey.

items measuring stimulation seeking separately, where high scores indicated a high degree of hedonism and stimulation seeking, while low scores indicated a low degree of hedonism and stimulation seeking.

Importance of appearance and health. Three items from a constructed battery of 15 items, designed for the LOGG survey, concerning the importance of different aspects in the respondent's life at the moment, were used in the analyses. This battery of items was part of the postal questionnaire, and the wording of the question was: "How important would you say that each of the following terms is in your life nowadays?". The items of interest in the current study were "health", "your weight" and "your looks", and they were each graded by a four-point rating scale with alternatives ranging from "not important" (= 1) to "very important" (= 4) (see Appendix C).

The weight and looks questions were combined into one measure termed "importance of appearance", due to medium inter-item correlations ($r = .46$) and a Cronbach's alpha value of .63, which can be considered sufficient for a scale of this size. A mean score on the importance of appearance construct was computed where a high score indicated a high emphasis on the importance of appearance, while a low score indicated a low emphasis on the importance of appearance. The health question remained as a single measure.

Statistical Analyses

The statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 19.

A principal component analysis, succeeded by Direct Oblimin rotation ($\delta = 0$), was carried out on the BSRI scale to evaluate the structure of the scale. To determine whether the data set was suited for this type of analysis, the correlations between the scale items were inspected to verify the presence of several coefficients above .30. In addition, the Bartlett's test of Sphericity should be significant with a probability value below .05, and the Kaiser-Meyer-Olkin measure of sampling adequacy (range 0 to 1) ought to be above .60 to ensure a proper analysis, as proposed by the literature (Pallant, 2007; Tabachnick & Fidell, 2007).

Furthermore, three methods were applied to decide the number of components to extract. Firstly, Kaiser's (1960) criterion of eigenvalues above 1.00 was followed. Secondly, the scree plot was inspected according to Cattell's (1966) recommendations. Finally, a parallel analysis was computed using the statistical program Monte Carlo PCA (Watkins, 2000), which is based on Horn's (1965) original methods of parallel analysis. When performing this type of analysis, the computer program randomly generates a data set of the same size as the data set of current interest, so that a comparison between the original and the

randomly generated eigenvalues can be made. Only eigenvalues from the original data set that are larger than the eigenvalues from the data generated set are adopted (Pallant, 2007).

Moreover, ordinal logistic regression analyses, also referred to as PLUMs (polytomous universal models) (DeCarlo, 2003), were performed to examine whether there were any gender and age tendencies related to snus consumption in the sample. This type of analysis was chosen due to the nature of the dependent variable, snus use, which is an ordinal variable with four response categories that are ordered in rank, but do not have fixed intervals between them. Logistic regression is also a flexible technique in the way that it does not have any presumptions about how the predictor variables are distributed nor their values (Tabachnick & Fidell, 2007). Hence, ordinal logistic regression analyses were used instead of ordinary linear regression analyses in order to achieve more nuanced and accurate results. The logit link function was chosen and odds ratios for all ordinal logistic regression analyses in the study were computed. The odds ratio in these analyses has to be interpreted as a cumulative odds ratio. More specifically, the odds ratio indicates the increased odds to belong to the next highest category compared to all other categories for each unit increase in the predictor. Furthermore, an interaction analysis with gender and age was performed through an ordinal logistic regression analysis to find out whether age tendencies in snus consumption differed for men and women. Ordinal logistic regression analyses to explore possible age and gender differences in cigarette consumption were also carried out, to examine if there were any variance in these patterns between the two types of tobacco consumption.

Mediation analyses were conducted in order to examine mechanisms that could explain the association between gender and snus consumption. Generally, a mediator is described as a variable that accounts for the association between the independent variable and the dependent variable (Baron & Kenny, 1986). That is, the independent variable affects the dependent variable through affecting the mediator variable, which in turn affects the independent variable. There are certain conditions that must be met in order to establish mediation. First, the dependent variable must be influenced by the independent variable. This step was conducted by investigating the relation between snus consumption and gender through ordinal logistic regression analysis. Second, the presumed mediator variable has to be influenced by the independent variable. Correlation analyses between gender and the possible explanatory variables were carried out in order to test the second step. Third, the presumed mediator variable has to influence the dependent variable. Correlation analyses between possible explanatory variables and snus consumption were used to test the third step. Fourth, the relationship between the independent variable and the dependent variable must be reduced

when the presumed mediator variable is controlled for (Baron & Kenny, 1986). Series of ordinal logistic regression analyses with snus consumption as dependent variable, and gender and possible explanatory variables as independent variables tested this final step. If all these conditions are met a partial mediation effect can be shown (Baron & Kenny, 1986).

Following the steps presented above, correlation analyses and ordinal logistic regression analyses were carried out in order to establish the extent to which the possible explanatory variables including masculinity, femininity, hedonism, stimulation seeking, importance of appearance, importance of health, age, level of education or level of income could mediate the association between snus consumption and gender. Furthermore, in addition to the analyses mentioned above, ordinal logistic regression analyses were also carried out to see if any of the potential explanatory variables in the study could account for the interaction effect between age and gender in snus consumption.

Results

The purpose of the present study was mainly to explore possible psychological factors related to gender differences in snus use, along with gender and age trends in snus consumption.

Participation in the Study

As presented earlier, the current study included respondents between 18-40 years that answered the postal questionnaire of LOGG. Only respondents that answered the telephone interview had the opportunity to answer the postal questionnaire. All in all, 3,885 (64.3 %) respondents between 18-40 years answered both the interview and the questionnaire. This LOGG subsample comprised 1,655 (42.6 %) males and 2,230 (57.4 %) females. Table 2 describes differences between those aged 18-40 years who merely responded on the telephone interview, and those in the same age group who responded on both the telephone interview and the postal questionnaire. The numbers suggest that the level of income is quite similar across the two sets of respondents. Yet, they indicate some differences in level of education between the respondents that answered the telephone interview, and those that answered both the telephone interview and the postal questionnaire. Furthermore, there seem to be considerably fewer respondents that answered both the interview and the questionnaire in the two youngest age groups, than in the two oldest.

Table 2

Differences between Respondents (Ages 18-40) Answering the LOGG Surveys

Variable	Telephone Interview				Telephone Interview and Questionnaire			
	n	%	<i>M</i>	(<i>SD</i>)	n	%	<i>M</i>	(<i>SD</i>)
Total	5,995	100.0	-	-	3,885	100.0	-	-
Gender								
Men	2,960	49.4	-	-	1,655	42.6	-	-
Women	3,035	50.6	-	-	2,230	57.4	-	-
Age Groups								
18-23	1,219	20.3	-	-	695	17.9	-	-
24-29	1,355	22.6	-	-	865	22.3	-	-
30-35	1,693	28.2	-	-	1,142	29.4	-	-
36-40	1,728	28.8	-	-	1,183	30.5	-	-
Education	-	-	3.04	(1.21)	-	-	3.21	(1.15)
Income	-	-	332,363	(237,007)	-	-	337,133	(224,311)

Examination of the Component Structure of the BSRI

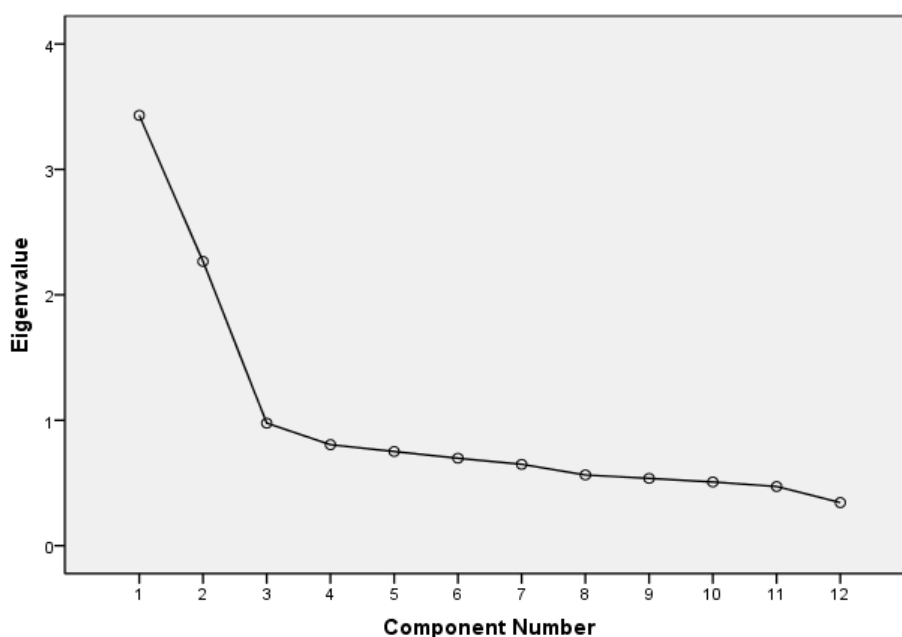
The component structure of the BSRI was examined through principal component analysis to evaluate the reliability and validity of the scale. When analysing the items of the

masculinity and femininity scales of the BSRI separately, the inter-item correlations showed no negative values. Furthermore, all the coefficients in the corrected item-total correlations were exceeding .30 for both subscales, suggesting that the items of the subscales are measuring the desired constructs (Pallant, 2007; Tabachnick & Fidell, 2007). Moreover, the suitability of the data to perform a principal component analysis was confirmed by a Kaiser-Meyer-Olkin value of .83 and the Bartlett's Test of Sphericity with a p-value of <.001. In addition, the correlation matrix for the different items displayed a majority of correlations exceeding .30, further indicating the appropriateness of such an analysis.

Principal component analysis was performed showing that two components had eigenvalues larger than 1.00. Component 1 explained 28.3 percent of the variance, while Component 2 explained 18.6 percent. When examining the scree plot (Figure 1), a marked break was visible after the second component before the line gradually phases out, supporting a two component solution. Calculations by the parallel analysis computer software generated a random data set with eigenvalues (12 variables x 2500 cases, seeing as 2500 were the maximum number of cases possible to generate in the program). When comparing the size of the eigenvalues with the values obtained from the parallel analysis only two eigenvalues exceeded those made from the randomly generated dataset, also indicating a two component solution.

Figure 1

Scree-Plot for the 12 Items of the BSRI



Moreover, Direct Oblimin rotation was carried out and the pattern and structure matrix of the rotation is presented in Table 3. As displayed, the items representing femininity all had strong positive loadings exceeding .50 on Component 1 (femininity) both in the structure and pattern matrix, while the masculinity items had no or weak loadings on this component (the majority of the loadings were below .20). Component 2 (masculinity) had strong positive loadings of all the items representing masculinity also exceeding .50, while the femininity items all had loadings lower than .30 on this component. A common criterion is that only component loadings of .32 or larger are considered (Tabachnick & Fidell, 2007). These patterns point to a very clear structure of femininity and masculinity measured by the BSRI, with the items loading considerably on one of the components only. The communality values, which are the variance that the components account for, ranged from .36 to .66. These values should not exceed 1.00 (Tabachnick & Fidell, 2007). Collectively, the two components explained 46.9 percent of the variance, and the correlation between the two components was weak ($r = .14$). The results of this analysis support the applicability of the scale for measuring masculinity and femininity as separate constructs.

Furthermore, the Cronbach's alpha of the masculine scale was .70, and .81 for the feminine scale. These values are considered to be within an acceptable range and indicate good internal consistency of the two subscales.

Table 3
Pattern and Structure Matrix for PCA with Oblimin Rotation of a Two Component Solution of the BSRI

Item	Pattern Coefficients		Structure Coefficients		Communalities
	Femininity	Masculinity	Femininity	Masculinity	
Sympathetic	.81	-.00	.81	.11	.66
Eager to Soothe Hurt Feelings	.81	-.02	.81	.09	.65
Tender	.72	-.02	.72	.08	.52
Understanding	.71	-.04	.70	.06	.49
Sensitive to the Need of Others	.71	-.03	.70	.07	.49
Compassionate	.56	.14	.58	.22	.36
Forceful	.07	.70	.17	.71	.51
Has Leadership Abilities	-.01	.68	.08	.68	.46
Aggressive	-.17	.63	-.08	.61	.39
Defends Own Beliefs	.11	.62	.20	.63	.41
Assertive	-.08	.59	.00	.58	.34
Willing to Take Risks	.14	.56	.22	.58	.36

Note. Component loadings >.40 are in bold numbers.

Snus Prevalence in the Sample

A total of 356 (9.2 %) of the respondents in the sample reported using snus on a daily basis. Tables 4 and 5 display snus prevalence for males and females grouped by age. Missing values were excluded from these frequencies tables on snus consumption, and the item nonresponses on snus was n= 22 (1.3 %) for men, and n= 25 (1.1 %) for women.

Table 4

Numerical and Percentage Distribution of Tobacco Consumption in the Sample According to Age Groups for Men

Variable	Men								Total	
	18-23		24-29		30-35		36-40			
	n	%	n	%	n	%	n	%	N	%
Snus										
Never	173	61.3	234	66.1	352	71.1	375	74.9	1,134	69.4
Rarely	33	11.7	29	8.2	20	4.0	24	4.8	106	6.5
Sometimes	25	8.9	22	6.2	32	6.5	23	4.6	102	6.2
Daily	51	18.1	69	19.5	92	18.6	79	15.8	291	17.8
Total	282	100.0	354	100.0	496	100.0	501	100.0	1,633	100.0
Cigarettes										
Never	190	67.6	238	67.0	362	73.1	347	69.3	1,137	69.6
Rarely	33	11.7	34	9.6	24	4.8	35	7.0	126	7.7
Sometimes	22	7.8	31	8.7	31	6.3	25	5.0	109	6.7
Daily	36	12.8	52	14.6	79	16.0	94	18.8	261	16.0
Total	281	100.0	355	100.0	496	100.0	501	100.0	1,633	100.0

Table 5

Numerical and Percentage Distribution of Tobacco Consumption in the Sample According to Age Groups for Women

Variable	Women								Total	
	18-23		24-29		30-35		36-40			
	n	%	n	%	n	%	n	%	N	%
Snus										
Never	302	74.2	442	88.0	599	94.3	636	96.2	1,979	89.9
Rarely	48	11.8	36	7.2	17	2.7	5	0.8	106	4.8
Sometimes	30	7.4	10	2.0	8	1.3	7	1.1	55	2.5
Daily	27	6.6	14	2.8	11	1.7	13	2.0	65	2.9
Total	407	100.0	502	100.0	635	100.0	661	100.0	2,205	100.0
Cigarettes										
Never	269	66.4	342	68.4	456	71.6	451	67.7	1,518	68.8
Rarely	36	8.9	36	7.2	36	5.7	35	5.3	143	6.5
Sometimes	30	7.4	39	7.8	37	5.8	34	5.1	140	6.3
Daily	70	17.3	83	16.6	108	17.0	146	21.9	407	18.4
Total	405	100.0	500	100.0	637	100.0	666	100.0	2,208	100.0

As shown in Table 4, daily snus consumption was reported by 17.8 percent (n= 291) of the men independent of age. Furthermore, daily snus consumption among men seemed to be less prevalent in the age group 36-40 (15.8 %) than the other age groups. The group with the highest reported prevalence of daily snus use was men between 24-29 years (19.5 %). However, daily snus use appeared to be relatively stable among the three youngest age groups in the sample. Additionally, when inspecting the numbers reported on snus consumption rarely and sometimes a clear decrease in prevalence with age comparing the youngest age group with the older ones could be observed.

The frequencies for women are displayed in Table 5, where averagely 2.9 percent (n= 65) reported using snus on a daily basis. The age group of women with the highest prevalence of snus consumption on a daily basis was clearly respondents between 18-23 years (6.6 %), and this occurrence of snus consumption was less widespread in the older age groups. Only 1.1 percent reported daily snus consumption in the age group 36-40 years. Likewise, using snus only rarely or sometimes seemed to decrease with age for women.

Summarised, snus consumption in general was seemingly substantially more widespread among men than women in the sample. Reviewing age tendencies, snus consumption was generally less prevalent in the older than the younger age groups for both men and women in the sample.

Gender and age tendencies in snus consumption. Analyses were performed to examine whether the observed gender and age tendencies in snus consumption were significant.

An ordinal logistic regression analysis was computed to test if there were any gender differences in the overall level of snus consumption in the sample. The results indicated such a difference with a gender estimate coefficient of 1.41 (95 % confidence interval [CI] lower bound [LB]: 1.23, upper bound [UB]: 1.58, odds ratio [OR]: 4.10, Wald: 254.47, $p < .001$). The positive value of the coefficient indicates that men in the sample were significantly more likely to use snus than women. Moreover, the odds ratio of the estimate can be interpreted in the way that the odds for daily use of snus (compared to using it less often or never) is 4.10 times higher for men than women.

Furthermore, ordinal logistic regression analyses were performed to test if there were any age tendencies regarding snus consumption. The estimate was negative and significant (estimate: -0.06, 95 % CI LB: -0.07, UB: -0.04, OR: 0.94, Wald: 76.77, $p < .001$), indicating an age tendency of snus consumption in the sample with snus use significantly decreasing with age. Both genders were also examined separately to check if there were any differences

regarding snus consumption and age (*men*: estimate: -0.03, 95 % CI LB: -0.04, UB: -0.01, OR: 0.97, Wald: 11.72, $p = .001$ and *women*: estimate: -0.13, 95 % CI LB: -0.15, UB: -0.10, OR: 0.88, Wald: 116.55, $p < .001$). Again, these analyses pointed towards more probability of snus use in the younger part of the sample for both men and women. However, when inspecting the estimate coefficients, it seems as though these age tendencies were slightly more pronounced for the females in the sample. To test this, an interaction analysis was conducted.

The sample was tested to see if any interaction effect of gender and age was present in snus use. The estimate coefficient was significant and positive and suggests that snus consumption decreased considerably more for women than men with age (*gender*age*: estimate: 0.09, 95 % CI LB: 0.07, UB: 0.12, OR: 1.09, Wald: 43.14, $p < .001$). Hence, the gender differences in snus consumption seem to gradually grow larger the older the respondents are. In addition, to see if age trends were curve-linear for both genders the models were tested with a squared age variable as an additional variable of the analyses, but these models proved to be non-significant ($p > .05$), indicating that the age tendencies in the sample were linear.

Smoking Prevalence in the Sample

As expected, cigarette consumption was more widespread in the sample than snus consumption. In all, 668 respondents (17.2 %) reported smoking on a daily basis. Smoking prevalence for both genders in the sample is also displayed in Tables 4 and 5. Again, missing values were excluded from these tables, and the item nonresponses on cigarette consumption were $n = 22$ (1.3 %) for men, and $n = 22$ (1.0 %) for women.

For both genders daily cigarette smoking was more prevalent in the older age groups (30-40 years), and women as a group somewhat exceeded men in daily cigarette consumption, respectively 18.4 percent and 16.0 percent. Furthermore, there were considerably fewer respondents reporting cigarette consumption rarely and sometimes compared to the number reporting daily smoking for both men and women. The age group 36-40 years reported more smoking on a daily basis compared to the other age groups in the sample. For women, there was seemingly a tendency towards smoking rarely or sometimes declining with age. For men, there was no such clear tendency when it comes to smoking rarely or sometimes, but here, smoking daily seemed to steadily increase with age (see Tables 4 and 5).

Gender and age tendencies in cigarette consumption. Similarly to snus consumption, the numbers on cigarette prevalence in the sample displayed some gender and age tendencies. These possible tendencies were tested using ordinal logistic regression

analyses. Firstly, the gender estimate coefficient did not reach statistical significance, indicating no marked gender differences in cigarette consumption in the sample (estimate: -0.07, 95 % CI LB: -0.21, UB: 0.07, OR: 0.93, Wald: 1.00, $p = .318$). Furthermore, both the sample as a whole and males and females separately, were tested on age tendencies in cigarette consumption. However, also here the estimate coefficients were non-significant, suggesting that there were no age differences in cigarette consumption in the sample (*total sample*: estimate: 0.00, 95 % CI LB: -0.01, UB: 0.01, Wald: 0.00, $p = .977$, *men*: estimate: 0.00, 95 % CI LB: -0.02, UB: 0.02, OR: 1.00, Wald: 0.00, $p = .983$, and *women*: estimate: 0.00, 95 % CI LB: -0.01, UB: 0.01, OR: 1.00, Wald: 0.00, $p = .966$).

Descriptive Statistics on the Independent Variables

Scores for men and women on the independent variables were compared. Table 6 presents a summary of the means and standard deviations together with t-tests and p-values for masculinity and femininity scores, scores on hedonism and stimulation seeking, importance of appearance and health scores, age, education and income in the sample. The sample displayed several significant gender differences in the distribution of scores on these variables.

Relatively small reported significant differences between the genders in mean scores on masculinity were observed (men = 3.45, women = 3.36). However, mean scores on femininity were significantly higher for women (4.03) than for men (3.64). Furthermore, the mean score on hedonism in the sample was rather high (4.48), while men and women did not significantly differ in their responses. When it comes to stimulation seeking, women (3.34) on average scored less than men (3.57).

The scores on the importance of appearance and health were, as anticipated, with women on average rating appearance and health as more important than men. Although significant, the difference in importance of health was not large, while the difference in importance of appearance between the genders was quite substantial. Moreover, women on average reported having higher education than men, while the mean income for men (396,161 NOK) was substantially higher than the mean income for women (293,285 NOK). There were no significant differences in age between the genders.

Table 6
Means and Standard Deviations for Independent Variables with Gender Differences Measured by T-Tests

Variable	Men (n = 1,655)		Women (n = 2,230)		Gender Differences		Total (N = 3,885)	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	<i>t</i>	<i>p</i>	<i>M</i>	(<i>SD</i>)
Masculinity	3.45	(.55)	3.36	(.56)	-5.02	<.001	3.40	(.56)
Femininity	3.64	(.54)	4.03	(.52)	22.28	<.001	3.86	(.56)
Hedonism	4.46	(.90)	4.50	(.89)	1.58	.12	4.48	(.90)
Stimulation Seeking	3.57	(1.04)	3.34	(1.09)	-6.64	<.001	3.44	(1.08)
Importance of Appearance	2.51	(.73)	2.83	(.68)	14.26	<.001	2.69	(.72)
Importance of Health	3.52	(.66)	3.66	(.58)	6.99	<.001	3.60	(.62)
Age	30.96	(6.41)	30.70	(6.51)	-1.20	.23	30.81	(6.46)
Education	3.14	(1.18)	3.26	(1.13)	3.12	<.01	3.21	(1.15)
Income	396,161	(255,782)	293,285	(186,021)	-13.86	<.001	337,133	(224,311)

Note. Gender is coded as following, female = 1 and male = 2.

Correlations between Explanatory Variables, Snus Consumption and Gender

Significant gender differences between average scores on the potential explanatory variables were mostly found. In order to calculate whether any of the explanatory variables in this study could have possible mediator roles regarding the association between snus consumption and gender, correlations between the variables were assessed (see Table 7).

As visible, all the variables were significantly associated with snus use, while hedonism and age were the only variables not significantly correlated with gender. Even though most correlations were moderate to small, the anticipated patterns of the correlations were for the most part confirmed. For instance, masculinity was positively associated with snus use ($r = .08$) and gender ($r = .08$), indicating snus use to correlate with higher scores in masculinity and masculinity scores to be higher among the men than the women.

Furthermore, the negative correlation between snus use and femininity ($r = -.09$) indicates respondents scoring high in femininity to be less likely to use snus, while the moderately negative correlation between femininity and gender ($r = -.34$) might express that the men were more likely to have lower scores in femininity than the women in the sample.

Moreover, hedonism was weakly positively associated with snus use ($r = .09$) and implies that respondents using snus on average have slightly higher hedonistic values than those not using snus. Stimulation seeking was positively correlated to snus use ($r = .12$) and to gender ($r = .11$) which indicates more likelihood for those scoring high on stimulation seeking to use snus, while the men in the sample in general are seemingly more stimulation seeking than the women.

When it comes to importance of appearance, the association to snus use was weakly negative ($r = -.05$) suggesting that the snus users emphasised appearance to a marginally lower extent compared to the non snus users. The correlation between importance of appearance and gender was also negative ($r = -.22$) indicating that men on average cared less about their appearance than women in the sample. Importance of health was weakly negatively correlated to snus use ($r = -.04$) and negatively correlated to gender ($r = -.11$). These associations imply that snus users in general emphasise importance of health to a lesser extent than those not using snus at all, whereas the women on average seemed to care more about their health in comparison to the men.

Meanwhile, education was weakly negatively associated to snus use ($r = -.05$) indicating that those using snus in the sample on average were less educated than non-snus users, while gender also had a weak negative correlation to level of education ($r = -.05$) suggesting that the men in general were slightly less educated in comparison to the women.

Table 7
Correlation Matrix for the Study Variables of the Sample

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Snus Use	1										
2. Gender	.28**	1									
3. Masculinity	.08**	.08**	1								
4. Femininity	-.09**	-.34**	.15**	1							
5. Hedonism	.09**	-.03	.28**	.21**	1						
6. Stimulation Seeking	.12**	.11**	.43**	.07**	.43**	1					
7. Importance of Appearance	-.05**	-.22*	.09**	.17**	.16**	.09**	1				
8. Importance of Health	-.04*	-.11**	.08**	.12**	.08**	.03	.29**	1			
9. Age	-.10**	.02	-.08**	-.03	-.21**	-.26**	-.03	.15**	1		
10. Education	-.05**	-.05**	.01	-.05**	-.11**	-.07**	-.03	.06**	.29**	1	
11. Income	.03*	.23**	.10**	-.16**	-.07**	-.06**	-.04*	.05**	.48**	.32**	1

Note. Gender is coded as following, female = 1 and male = 2. * $p < .05$ (2-tailed), ** $p < .01$ (2-tailed).

The correlation between snus use and income was weakly positive ($r = .03$), and might express a small tendency of snus users in the sample on average being more educated than non-snus users. Moreover, gender and income also had a positive association ($r = .23$), indicating that men in the sample in general earned more than women.

Mediation Models

Six models of ordinal logistic regression analyses, with the explanatory variables and gender as dependent variable, were computed to examine whether they could significantly affect the association between snus use and gender (see Table 8). As commented above, the correlation between hedonism and gender was not significant. Accordingly, hedonism was not able to function as a mediator variable, but this variable was still included in the analyses as it is of interest to investigate to what degree hedonism is associated with snus consumption. Following Baron and Kenny's (1986) procedures for mediation, as mentioned previously, the relation between snus consumption and gender must be reduced when the explanatory variable is controlled for, in order to establish a mediation effect.

In the first model, gender and age were the independent variables analysed according to snus consumption. Both gender (estimate: 1.43) and age (estimate: -0.06) significantly predicted snus use in this model, again confirming the gender and age patterns that was shown in former analyses in the current study.

In Model 2, masculinity and femininity were added to the model with gender and age. The gender variable was significant in this second model with a slightly lower coefficient and reduced odds ratio (estimate: 1.42, OR: 4.14), while the age variable remained significant and unchanged. The masculinity variable significantly predicted snus use (estimate: 0.27), while the femininity variable was not significant ($p > .05$). These results suggest that gender partly predicted snus consumption through masculinity, and higher scores on masculinity were on average associated with higher probability of snus use in the sample. Femininity, however, seemingly could not significantly explain any variance in snus consumption beyond the variance explained by gender, age and masculinity in the sample.

In the third model, gender, age, hedonism and stimulation seeking were examined. All four variables were significant in this model. Nevertheless, the gender variable remained unchanged (estimate: 1.43), while the age coefficient slightly decreased (estimate: -0.05). Hedonism was positively associated with snus consumption (estimate: 0.23), indicating that higher scores on hedonism in the sample were on average associated with a higher likelihood of using snus. Stimulation seeking was weakly positively associated with snus consumption (estimate: 0.09, $p = .042$), implying that this variable can explain part of the variance in snus

consumption, with higher scores on stimulation seeking on average being associated with a higher probability of using snus in the sample. However, stimulation seeking did not reduce the association of gender to snus use in the current model, which suggested that this variable could not mediate the association between gender and snus consumption in the sample. To examine whether the hedonism variable was masking the mediation effect of the stimulation seeking variable (hedonism had a slightly negative, non-significant correlation to gender $r = -.03$), Model 3 was run again without the hedonism variable. The gender estimate and the odds ratio for the estimate was significantly reduced in this new model, while the stimulation seeking estimate remained significant, implying that gender partly predicted snus consumption through stimulation seeking (*gender*: estimate: 1.40, 95 % CI LB: 1.21, UB: 1.58, OR: 4.06, Wald: 223.67, $p < .001$, *age*: estimate: -0.06, 95 % CI LB: -0.07, UB: -0.04, OR: 0.94, Wald: 63.59, $p < .001$, *stimulation seeking*: estimate: 0.17, 95 % CI LB: 0.09, UB: 0.25, OR: 1.19, Wald: 15.64, $p < .001$). Consequently, it appears as though stimulation seeking does mediate the gender-snus association, but that the hedonism variable initially reduced this mediation effect due to the negative correlation with gender.

Gender, age, importance of appearance and importance of health were examined in Model 4. Both gender and age were significant in this model, while importance of appearance and importance of health did not reach statistical significance ($p > .05$). Accordingly, importance of appearance and importance of health seemingly could not predict snus consumption in the sample beyond the explained variance of the gender and age variables.

In the fifth model, the gender, age, education and income variables were investigated. Here, all variables reached statistical significance except education ($p > .05$). The gender coefficient decreased in this model (estimate: 1.39), while the age coefficient increased (estimate: -0.07). Moreover, the coefficient for income was slightly significant and positive (estimate: 0.04, $p = .049$). These results suggest that level of income accounted for part of the variance in snus use associated with gender, and that a higher income on average was related to a higher probability of snus consumption in the sample.

All the ten previous variables were fitted into a final model (Model 6). The purpose was to examine to what extent the explanatory variables collectively could predict snus consumption and account for the variance explained by gender. Only gender, age and hedonism obtained significant values, while none of the potential mediating variables reached statistical significance in this model ($p > .05$), and could not uniquely explain gender variations in snus use when controlling for all variables simultaneously. The gender coefficient decreased (estimate: 1.38), while the age variable kept its initial coefficient

(estimate: -0.06). Hedonism obtained the same value as in Model 3 (estimate: 0.23), again indicating that the hedonism variable in itself is could predict snus consumption independently of the variance explained by gender and age in the sample.

Table 8

Six Ordinal Logistic Regression Models with Snus Use as Dependent Variable

Variable	Estimate	95 % CI		OR	Wald	p
		LB	UB			
Model 1:						
Gender	1.43	1.25	1.61	4.18	236.55	<.001
Age	-0.06	-0.08	-0.05	0.94	86.37	<.001
Model 2:						
Gender	1.42	1.22	1.61	4.14	201.71	<.001
Age	-0.06	-0.08	-0.05	0.94	82.36	<.001
Masculinity	0.27	0.10	0.43	1.31	10.33	.001
Femininity	0.01	-0.16	0.18	1.01	0.02	.902
Model 3:						
Gender	1.43	1.24	1.61	4.18	230.73	<.001
Age	-0.05	-0.07	-0.04	0.95	54.46	<.001
Hedonism	0.23	0.12	0.34	1.26	16.42	<.001
Stimulation Seeking	0.09	0.00	0.18	1.09	4.14	.042
Model 4:						
Gender	1.45	1.27	1.64	4.26	231.21	<.001
Age	-0.06	-0.08	-0.05	-0.94	85.43	<.001
Importance of Appearance	0.05	-0.08	0.18	1.05	0.63	.428
Importance of Health	0.04	-0.10	0.19	1.04	0.32	.574
Model 5:						
Gender	1.39	1.21	1.58	4.01	214.24	<.001
Age	-0.07	-0.09	-0.05	0.93	72.78	<.001
Education	-0.02	-0.01	0.06	0.98	0.29	.589
Income	0.04	0.03	0.09	1.04	3.89	.049
Model 6:						
Gender	1.38	1.18	1.58	3.97	176.35	<.001
Age	-0.06	-0.08	-0.04	0.94	46.40	<.001
Masculinity	0.11	-0.07	0.29	1.11	1.45	.229
Femininity	-0.04	-0.21	0.13	0.96	0.22	.638
Hedonism	0.23	0.11	0.34	1.26	14.69	<.001
Stimulation Seeking	0.07	-0.03	0.17	1.07	2.07	.151
Importance of Appearance	-0.01	-0.14	0.12	0.99	0.02	.894
Importance of Health	0.01	-0.13	0.16	1.01	0.03	.875
Education	-0.01	-0.09	0.07	0.99	0.04	.837
Income	0.03	-0.01	0.07	1.03	1.95	.162

Note. CI = confidence interval; *LB* = lower bound; *UB* = upper bound; OR = odds ratio.

Multiple mediation models with the interaction effect of gender and age. An interaction effect between gender and age in predicting snus consumption was previously found in this study, and indicates that gender differences in snus consumption seem to grow larger with age in the sample. It is possible that levels on the explanatory variables develop differently with age between the genders and accordingly could account for the interaction effect at hand. To explore if this interaction effect can be explained by any of the previous explanatory variables comprehending masculinity, femininity, stimulation seeking, importance of health, importance of appearance, education and income, ordinal logistic regression analyses were once again carried out.

The following analyses were performed in the same manner as the former analyses in models 1-6, except for the interaction variable being added to gender and age in Model 1 and kept in all the following models in line with the gender and age variables in the former analyses. However, the estimate coefficient of the interaction variable remained unchanged and significant through the new models 1-6 (estimate: 0.09, $p < .001$ in all models). These results show that none of the explanatory variables could account for the variance in snus consumption beyond the variance accounted for by the interaction variable. Consequently, these variables did not explain the tendency of snus consumption decreasing faster with age for women than for men in the sample.

Discussion

The present study aimed at examining possible psychological mechanisms that can account for gender differences in snus consumption. Clear gender and age trends appeared in the sample with considerably higher snus prevalence among men than women, and a decline in snus consumption with age for both genders. Furthermore, several psychological dispositions were investigated to see to what degree they could mediate the association between gender and snus consumption. The results indicate that masculinity, stimulation seeking and income functioned as partial mediator variables between gender and snus consumption in the sample. Furthermore, hedonism seemed to be a valid predictor of snus consumption, but did not operate as a mediating factor between gender and snus use in the sample. Still, it is important to note that the mediation effects were relatively small, and that causal inferences cannot be drawn from these data alone, as will be commented later on.

Gender and Age Differences

Some clear trends emerged in the sample regarding gender and age differences in snus consumption. Males were more likely to use snus than females, while younger respondents were more likely to use snus than older respondents. This age tendency held true for both males and females, and an interaction effect between gender and age was also confirmed. This effect indicated that the decrease in snus consumption with age is more pronounced for women than men, suggesting that female snus use is mostly reserved for the youngest age group in the sample, while the decrease in snus prevalence with age for men seems to follow a slower pace.

These age and gender patterns in the sample were in line with the numbers from 2008-2009 in the Norwegian Directorate of Health's report on the population in general (Helleve et al., 2010), where the youngest cohort of males (16-24 years) constituted the group with the highest reported snus prevalence in the sample, while the following male cohorts gradually reported less snus prevalence with age. Snus prevalence for females in the youngest cohort was considerably lower than that of males, and an abrupt decline in reported snus prevalence in the following female cohorts was present. Moreover, the oldest female age cohorts did not report any snus prevalence at all (Helleve et al., 2010). Other Norwegian studies have confirmed the gender patterns found in the present study in various smaller samples (see Wiiium et al., 2009; Øverland et al., 2008b; Åstrøm et al., 2007) and one larger sample (Grøtvedt et al., 2008).

The age trends that were found have only partly been confirmed in other studies, but these studies are few and are conducted on young samples, with smaller age span than the

current study. In a study on university students, snus consumption increased with age for males (the oldest respondents were 21 years), and decreased with age for females (Åstrøm et al., 2007), which corresponds to the age trends for men in the present study, but the trends were reverse for women. Another study on adolescents between 16-20 years found an increase with age for snus consumption among males with the highest reported prevalence of snus use among 19-year-olds, but no significant age differences for females were found (Wiiium et al., 2009). Moreover, studies from Sweden also confirm the present gender patterns in snus consumption (Engström et al., 2010; Furberg, Lichtenstein, Pedersen, Bulik, & Sullivan, 2006; Ramström & Foulds, 2006). Still, numbers from national statistics in Sweden indicate that snus prevalence among men is slightly differently spread between age groups than in Norway (The Swedish National Institute of Public Health, 2011). Here, men between 30-64 years reported the highest snus prevalence, while snus prevalence is highest among younger males in Norway. For women, the youngest age group (16-29 years) reported the highest prevalence, which is more in line with the numbers on females in Norway. Longer traditions of snus consumption and a peak in snus prevalence for men in Sweden could be an explanation for these apparent age differences in consumption between men in Sweden and Norway.

No gender or age trends for cigarette consumption were found in the sample. This is also, to a certain degree, corresponding to the numbers reported previously on smoking prevalence for the population in general from 2008-2009 (Helleve et al., 2010), which did not indicate any pronounced gender differences, even though some age differences were suggested in these numbers, but not in the present study. A lack of age patterns found in the sample could be due to smoking being more prevalent among the middle-aged population, while smoking seems to be more equally distributed among the younger age groups (Helleve et al., 2010). As the sample consists of respondents between 18-40 years only, this might have contributed to the fact that no age differences were found. Also, national statistics in Sweden indicate that the cigarette prevalence is the highest for middle-aged men and women (45-64 years) (The Swedish National Institute of Public Health, 2011).

When contrasted with cigarette prevalence reported in the study sample and the population in general, snus consumption stands out as a tobacco phenomenon that is mainly reserved for the younger part of the population, and younger men in particular. Snus does not merely seem to be an agent of nicotine delivery that is equally used by both genders such as cigarettes, but rather to represent something different for men and women. Consequently, investigating psychological factors underlying snus consumption could contribute to the

understanding of what is behind the gender differences in snus use. Earlier on, smoking was mostly reserved for men and considered to be an expression of masculinity, which is part of the reasoning behind choosing the current psychological variables in this study. Moreover, the fact that snus consumption seems to decrease faster with age for women than for men is interesting. Snus consumption is to a certain extent regarded as trendy among younger women, and the perception of snus as trendy and attractive might function as predictors of snus use for these young women (Wiiium et al., 2009), while the same perceptions of snus might not exist among women in older age groups. Furthermore, young women appear to be particularly vulnerable to peer influence and social norms when it comes to snus consumption (Åstrøm et al., 2007), and it is possible that positive perceptions of snus among young women and more negative perceptions of snus among older women, can explain part of this rapid decrease in snus consumption with age for women. Could it be that snus is not considered suitable for women after a certain age, and could this perception change in the future?

It is only in recent years that snus manufacturers have grown considerable interest in women and started marketing snus products targeting women in particular (Holm, Fisker, Larsen, Puska, & Halldórsson, 2009; Åstrøm et al., 2007). As mentioned, snus seems to represent something different in the population than smoking does. Whether snus consumption will remain in this position in the population, with low prevalence among younger women and high prevalence among younger men, or if the patterns in snus consumption are changing with norms and health policy and with snus consumers continuing to use snus with aging, is uncertain. The report from the Norwegian Directorate of Health (Helleve et al., 2010) suggests that the rate of increase in snus consumption for younger men has slowed down during the last few years and may have stagnated, while for younger women, there has been a marked increase in consumption in the same time span. Furthermore, a study on Norwegian adolescents reported that the relative increase in snus consumption for girls between 2004 and 2007 were higher than for boys, still, snus use was far more common among boys both years (Øverland et al., 2008b). This could indicate that the increase in snus consumption is starting to stabilize among men, but that snus use is still advancing among women. Differences in snus use in the population today might be similar to differences in smoking several decades ago. Accordingly, it has been suggested that snus use could follow the same diffusion process in Norway as smoking historically did, with the prevalence among men reaching its peak and starting to decline before the prevalence among women reach its peak (Helleve et al., 2010; Lund et al., 2008). In this regard, close monitoring of the diffusion of snus in the population should be a high priority in coming years to identify the most

important groups for intervention work.

Possible Explanations for Gender Differences

Turning to the explanatory variables some mediation effects between gender and snus consumption were found. Notably masculinity, stimulation seeking and income were all variables that affected the association between snus and gender in the sample. Nevertheless, these mediation effects were quite small.

As expected, masculinity appeared to function as a mediator for gender and snus consumption. This indicates that snus consumption has some properties that are related to masculinity orientations in the sample. Furthermore, men scored significantly higher on masculinity than the women in the sample, which also contributed to the partial mediation effect that was shown. As mentioned earlier on, snus has been characterised as “unfeminine” by both males and females (Lundqvist et al., 2007; Stjerna et al., 2004). Still, “unfeminine” does not necessarily mean the same as “masculine” in these studies. However, snus seem to be associated with masculine oriented arenas such as ice-hockey (Rolandsson & Hugoson, 2003; Stjerna et al., 2004), which is in line with the present result. It seems as though snus use to a certain degree is an expression of masculinity orientations in today’s society and differs from smoking in this respect. Traditionally, snus use seems to have been closely associated to typically male behaviour. Whether the perception of snus as something masculine is changing with more feminine versions of snus being introduced to the market, and with an increasing amount of women initiating snus consumption behaviour, should be addressed in future research. Finally, masculinity was not significant in the last model where all explanatory variables were included simultaneously. All in all, the results indicate that masculinity predicts snus consumption to a certain extent and partly explains gender difference in snus consumption, but there seem to be other variables that play more evident roles in the explanation of the relation between gender and snus consumption in the sample.

Stimulation seeking also mediated the gender-snus association, and higher scores on stimulation seeking seem to generally predict snus use in the sample. Men demonstrated higher scores on stimulation seeking than women, which accounted for some of the mediation effect. Stimulation seeking as a predictor of snus use coincides with one qualitative study that suggested snus as a means to achieve a certain state of affect and for stimulation and arousal needs (Nordby & Wood, 2008). Furthermore, the result is in line with literature on stimulation/sensation seeking and the use of other intoxicating substances. Stimulation seeking has for instance been associated with frequency of alcohol consumption and alcohol use disorders (Shin, Hong, & Jeon, 2012), and as a predictor of alcohol dependence (Atwell,

Abraham, & Duka, 2011). The stimulation seeking variable was not significant in the final model comprising all explanatory variables. Altogether, stimulation seeking appears to account for some of the gender differences in snus consumption. Nevertheless, other variables seem to be more strongly associated with snus consumption in the sample than this very variable.

Income was another explanatory variable partially mediating the relation between gender and snus consumption, and a higher level of income predicted snus consumption in the sample. Previous research supports this result, to a certain degree, with one study indicating that snus use is associated with an intermediate level of income for men, while no clear association was found between snus consumption and income for women (Engström et al., 2010). Another study did not find snus to be a marker of socio-economic status in general (Rosendahl et al., 2008). Furthermore, men earned significantly more than women in the sample, which can explain part of the association with the gender-snus relation. When put together with all explanatory variables in the last model, income was not significant. It appears as though income is a valid predictor of snus consumption and can explain part of the gender difference, but that other explanatory variables had stronger associations to snus use and gender in the sample.

Hedonism was a relatively strong predictor of snus consumption, which indicates that higher scores on hedonism are related to higher probability of snus use in the sample. Nevertheless, hedonism did not function as a mediator of the association between gender and snus, seeing that no gender difference in hedonism scores was found in the sample. As pointed out earlier, research on snus consumption and hedonism seems to be scarce, and should be subject to more research. However, one study suggested that both men and women attach hedonism-like values to snus consumption, and underlined the importance of focusing on such motivational factors of snus use when designing snus interventions (Åström et al., 2007). One qualitative study indicated that snus consumption was related to specific times of the day, such as after a meal (Nordby & Wood, 2008). In this respect, perhaps snus might function as a means of reward or “dessert”, when relaxing. As already mentioned, the sample did not significantly vary for men and women in scores on hedonism, which was a bit unexpected. This lack of gender differences in valuing hedonism could be due to several reasons, such as possible weaknesses in the measure of this variable or that hedonistic values are more equally distributed among the genders in Norway. Moreover, hedonism was the only variable that was significant in the last model comprising all the explanatory variables, which further emphasises the role of hedonism as a predictor of snus consumption. The results

indicate that hedonistic needs motivate snus consumption for both men and women in the sample, and do not seem to explain gender differences in snus use. If future studies were to confirm this association between hedonism and snus consumption, further prominence to focus on hedonistic properties of snus consumption in intervention work should be made.

The four remaining explanatory variables could not significantly predict snus consumption in the sample, beyond the variance explained by the other variables. Femininity did not function as a mediator of gender differences in snus consumption and did not significantly predict snus use in the current sample. Other than two previously mentioned studies identifying snus consumption as “unfeminine”, no research that refers to femininity aspects and snus consumption was found. Moreover, that “unfeminine” refers to the opposite of feminine in the present study is questionable, and caution must be made in directly linking this reference to the current result. Masculinity was identified as a significant predictor of snus consumption in the sample. One possibility for masculinity being significant, while femininity was not, could be that for some men, snus use is important for their perceptions of being manly or masculine, while snus is not an equally important marker for women’s perceptions of not being feminine. All in all, prospective studies on femininity and snus consumption could potentially find an association between these variables. Moreover, considering eventual changes in the society relating to snus consumption among women, future associations between femininity and snus use may be positively or negatively related.

The fact that importance of appearance could not significantly predict snus consumption and did not mediate the relation between gender and snus, was slightly unexpected. Women are in general more appearance oriented than men, and men scored significantly lower on importance of appearance than women in the study. Past research has suggested that women consider snus as more unattractive and less trendy than men (Wiiium et al., 2009). However, the present results indicate that importance of appearance is not a major determinant for snus consumption for neither women nor men, and do not contribute to the understanding of mechanisms underlying gender differences in snus consumption in the sample. One possible explanation for this result could be that positive physical aspects of snus, such as the use of snus as a measure for weight reduction, and negative physical aspects of snus, such as discoloured teeth and a lip bulk, are pulling in opposite directions causing a non-significant result. Moreover, the measure of appearance in the present study was quite general, and do not specifically relate to appearance aspects of snus consumption, which further may have contributed to the lack of association in the sample.

Also, importance of health could not significantly predict snus consumption or mediate

the gender-snus association in the sample. This result is partly conflicting with one previous study where negative expectancies of health risk related to snus significantly predicted snus use intentions (Larsen et al., 2011). Furthermore, women are considered to be more concerned about their health than men, and former studies suggest that females perceive snus as more health threatening than males (Loukas et al., 2011; Øverland et al., 2008a; Åstrøm et al., 2007). As mentioned when discussing importance of appearance above, this lack of association between emphasis on health and snus could again be due to an all too general measure, and the result might have been different, provided that a measure on perceptions of health risks associated with snus consumption was used. Moreover, individuals using snus as a means to quit smoking could further explain the non-significant result (see e.g. Lund et al., 2011). In this case, snus consumption might actually be health promoting, indicating that certain groups of snus consumers are considerably concerned about health and health aspects.

Finally, education did neither significantly affect the gender-snus relation in the regression models nor significantly predict snus consumption beyond the variance accounted for by the other explanatory variables. Previous research have found snus consumption to be negatively associated with educational ambitions in adolescence (Grøtvedt et al., 2008), and a low educational level for men (Engström et al., 2010), while female university students reported more snus consumption than women not pursuing higher education in the same age group (Lund et al., 2008). Moreover, other studies have not found any clear association between education and snus consumption (see e.g. Helleve et al., 2010). In general, studies on snus and socio-economic status are inconsistent and further research is needed to establish whether income or other socio-economic variables could function as predictors of snus use, and whether these variables operate differently by gender and age.

The multiple mediation models indicated that none of the explanatory variables could explain the interaction effect of gender and age in the sample when it comes to snus consumption. More research is needed on factors that can explain why snus consumption decreases with age, and why the decrease with aging seems more rapid for females than males. Possible factors explaining this decrease in snus consumption with age could be differences in perception of snus among the older part of the population, particularly among women. The inclusion of direct questions on perceptions of snus in the present study such as perceptions of health effects and attractiveness/trendiness could potentially have explained part of this age trend.

It is likely that numerous factors are contributing to the fact that more men are using snus than women. In this study, masculinity, stimulation seeking and income were the only

factors significantly mediating the association between gender and snus consumption, while hedonism predicted snus consumption in both men and women. A thorough understanding of factors affecting snus behaviour is vital to design preventive measures for different layers of the population that are effective. Until now, very few studies have investigated snus consumption and identified factors that motivate snus consumption in the Norwegian population (Åstrøm et al., 2007). Consequently, more research is needed to further establish mechanisms underlying snus consumption and the current gender difference.

Strengths and limitations

The main strength of the present study is the large and representative sample that LOGG comprises. Another important strength is the consideration and application of analytical methods that were adapted to the dependent, ordinal variable at hand. Furthermore, to the author's knowledge, this is the first quantitative study examining gender differences in snus consumption with the current psychological variables.

Nevertheless, the present study also had certain limitations that need mentioning. First, self-reports from the respondents were used to assess the majority of the variables in the study. Besides being a subjective measure, self-reports can be unreliable in the manner that respondents might answer in an imprecise or careless fashion, and thereby adding error to the data. Perhaps other methods of collecting data such as observation, or collecting the current data through the telephone interview, would result in more precise responses. Still, self-report data are more anonymous and might be less vulnerable to socially affected responses than the other suggested data collecting methods.

Second, the drop-out rate of respondents from the study could potentially affect the representativeness of the data. A tendency of females and older respondents with higher level of education being more likely to answer the questionnaire was present in the sample. This could, for instance, lead to a possible misrepresentation of snus users in the sample and affect the present gender and age trends in snus consumption, which could question the generalizability of the results.

Third, the variables in the analyses only explain a small part of the variance in snus consumption, and other variables should possibly have been included in the analyses to explain more of the variance. For instance variables such as alcohol consumption, life satisfaction, physical activity, self-reliance and self-control could potentially account for some of the variance. Furthermore, third variable problems could conceivably lead to mistaken associations between the variables in the analyses. As mentioned earlier, perceptions of health risks associated with snus and perceptions of attractiveness/trendiness of snus could represent

possible third variables.

Fourth, the data are cross-sectional and causal conclusions from the analyses should consequently be drawn with caution, since the effect can go in both directions. To illustrate, one possibility could be that individuals that have higher scores on masculinity do not have a higher likelihood of initiating snus use, but that using snus leads to higher scores in masculinity. In this sense, snus consumption could be thought to foster masculinity characteristics in an individual, and masculinity would not explain gender differences in snus consumption. Experimental designs or longitudinal data are needed to control for reverse causality. A second round of LOGG will be conducted in 2012-2013, and could be of interest in this regard. Whether snus prevalence and gender and age patterns in snus consumption are altered today, could also be examined with these longitudinal data.

Fifth, some of the measures used in the study were not ideal. Optimally, more than one single item measuring “importance of health”, and more than two items measuring “hedonism”, “stimulation seeking” and “importance of appearance” would be of preference. Some of these measures had reliability coefficients slightly below .70, which are considered to be weak. This could potentially raise issues of low reliability and lead to weaker associations in the findings than what is present in the sample, and to some of the expected associations not being found. Also, more detailed questions on snus consumption could have been of interest, such as questions on snus dependence and type of snus normally used (e.g. loose or pre-portioned snus), seeing as there seem to be gender differences in snus type preferences. However, other measures of these constructs were not available in the current data set. Furthermore, the methodological challenges of the BSRI scale regarding reliability and validity, which was discussed previously, can also be considered a study limitation. Still, the principal component analysis that was performed indicated that the BSRI measured the desired constructs, and accordingly, this scale seemed to function well in the present study.

Finally, the current mediation analyses could ideally be further formalised through a Sobel-test (1982), which estimates the significance of the mediation effect. However, this test is designed for continuous variables, and cannot be directly applied to ordinal logistic regression analyses. Regrettably, no simple approach to perform this type of test on the current analyses was found.

Conclusion

Snus is a tobacco product that has spread considerably in Norway in recent years. The high level of snus consumption among young men in particular is a concern, and developing interventions for this group is important. Also, preventing the late increase in snus consumption among young women and further keeping snus consumption among women on a low level should be given priority. The results in the present study indicate that particularly masculinity, stimulation seeking and hedonism could be important variables to consider in intervention work planning. Furthermore, the results imply that snus interventions should especially be pointed towards younger men and women whose psychological profile portrays a considerable presence of the aforementioned variables. Interventions designed for younger men could potentially focus on altering the view of snus as something masculine, and raise awareness around and encourage more healthy measures of meeting stimulation and hedonistic needs. Moreover, the results suggest that interventions designed for younger women could potentially benefit on concentrating around hedonistic aspects of snus consumption in particular. One previous study has also emphasised the importance of intervention work focusing on psychologically rewarding aspects that men and women attach to snus consumption (Åstrøm et al., 2007). However, more research is needed to support the relevance of the results of the present study, and to identify other variables that may be associated with snus use.

Even though the severe negative health effects of snus consumption remain somewhat inconclusive, it is nevertheless important to aim at getting a deeper understanding of possible predictors of snus use, especially the underlying mechanisms that makes gender such a strong predictor of snus consumption. With deeper insight in these mechanisms, more effective measures to regulate the spread of snus can be evolved. Few prior studies addressing psychological mechanisms underlying snus behaviour have been performed. For these reasons, future directions for research should include further examination of the psychological mechanisms identified as valid predictors in the current study. Also, more research on possible socio-economic patterns of snus consumption with the purpose of identifying other potentially important subgroups that need carefully designed interventions would be of interest.

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Appendix A – Questions on Tobacco Consumption

The questions on tobacco/nicotine consumption from the LOGG questionnaire.

15 Bruker du, eller har du brukt noen av følgende typer tobakk/nikotin? Sett ett kryss per linje.

	Før, men ikke nå	Aldri	Sjelden	Av og til	Daglig	Antall enheter per dag
Sigaretter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Snus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Andre former for tobakk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Nikotintyggegummi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Andre nikotinpreparater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

Appendix B – Questions on Gender Roles

The questions from the Bem Sex-Role Inventory taken from the LOGG questionnaire.

2 Nedenfor ser du en liste over egenskaper folk kan ha. Hvor godt stemmer dette for deg? Sett ett kryss per linje.

	Stemmer ikke i det hele tatt	Stemmer nok så dårlig	Stemmer delvis	Stemmer nok så godt	Stemmer helt
Pågående	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forståelsesfull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Har lederegenskaper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hengiven	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trøster gjerne andre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forsvarer mine meninger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viser medfølelse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Villig til å ta sjanser	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Øm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Selvhevdende	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Følsom for andres behov	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viljesterk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix C – Questions on Importance of Appearance and Importance of Health

The questions on the importance of appearance (looks + weight) and importance of health taken from the LOGG questionnaire.

44 Hvor viktig vil du si at hvert av de følgende forhold er i livet ditt nå for tiden? Sett ett kryss per linje.

	Svært viktig	Ganske viktig	Litt viktig	Ikke viktig
Venner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Familie	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Materiell levestandard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ditt arbeid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fritid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Din vekt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tro og religion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Politikk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natur og friluftsliv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foreningsliv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stedet du bor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boligen din	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kunst og kultur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ditt seksualliv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ditt utseende	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix D – Questions on Hedonism and Stimulation Seeking

The questions from the Basic Human Value Scale taken from the LOGG questionnaire.

55 Nedenfor beskriver vi ganske kort hva noen personer synes er viktig. Les hver beskrivelse og angi med et kryss hvor lik eller ulik deg hver av personene er? Sett ett kryss per linje.
Det er viktig for denne personen...

	Svært lik meg	Lik meg	Nokså lik meg	Bare litt lik meg	Ikke lik meg	Overhodet ikke lik meg
å tenke ut nye ideer og gjøre ting på sin egen måte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å ha mange penger og dyre ting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å vise andre hva man kan og evner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å leve i trygge og sikre omgivelser	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å gjøre mange nye og forskjellige ting i livet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
at folk gjør som de blir fortalt og følger reglene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å lytte til og forstå mennesker som er forskjellige fra seg selv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å bestemme selv hvordan en skal leve sitt liv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å hjelpe og vise omsorg for andre mennesker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å ha suksess	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å leve et spennende liv og ta risiko	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å alltid oppføre seg skikkelig og ordentlig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å ta ledelsen og fortelle andre hva de skal gjøre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å være lojal og ta vare på sine venner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å ta vare på miljøet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
at det er ordentlig og rent omkring seg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å følge den skikk og bruk en har blitt lært opp til	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å kunne nyte livet og "skjemme seg selv bort"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å beskytte de svake og behandle alle rettferdig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å ha det moro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
å være beskjeden og ikke peke seg ut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

See the internet links for the full version of the LOGG postal questionnaire (in Norwegian):

http://norlag.nova.no/asset/4989/1/4989_1.pdf, and the telephone interview (in Norwegian):

http://norlag.nova.no/asset/4990/1/4990_1.pdf.