

DO FIRST IMPRESSIONS MATTER?

HOW PRODUCT PACKAGING AND WARNING MESSAGES INFLUENCE YOUNG
ADULTS' CONCEPTIONS AND INTENTIONS TO USE NICOTINE POUCHES

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How product packaging and warning messages influence young adults' conceptions and intentions to use nicotine pouches.

Abstract:

Tobacco-free nicotine pouches have become increasingly popular in Sweden, especially among young adults. This thesis examines how packaging and warning messages could influence young adults' conceptions and intentions to use nicotine pouches.

Furthermore, the thesis intends to empirically examine if message framing and changes in product packaging can serve as a potential solution to decrease the attractiveness of nicotine pouches (NP) used in Sweden. A quantitative study was conducted by distributing a questionnaire physically at university campuses and digitally on various social media platforms. We conducted a randomized control trial on 282 participants in which they evaluated one of five different versions of the NP package. We tested two types of packaging (non-plain vs. plain) and two types of message framing (gain vs. loss). The empirical results indicated that plain packaging negatively influenced the participants' conceptions of and intentions to use the product. However, no significant results were found for the message framing. There was no statistical significance concerning the interaction effects of packaging and message framing, nor was there statistical significance between the current, unmanipulated product design and the altered NP product design.

Key Words:

Health warnings, Plain packaging, Framing, Prospect theory, Nudging, Nicotine, Smoking cessation.

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Definitions

Addiction: Addiction is characterized by compulsive drug seeking and use, even in the face of negative health consequences (National Institute on Drug Abuse, 2020).

Attitude: The degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question (Ajzen, 1991).

Behavioral research: A way to examine and understand individual and social behavior through measurement and interpretation.

Between subject study: When participants are assigned to different treatment groups, each subject receives only one treatment condition.

Conception: The way in which something is understood, thought about, perceived, or regarded, in the case of this study, the nicotine pouch products

Control package: The control version of the package in this thesis refers to the package that is not manipulated in the intervention and that is similar to the current packaging. It is worth noting that the small-lettered declaration content and the age limit were removed from the control package to improve the quality of the Photoshop design.

Packaging: Container in direct contact with the product, which holds, protects, preserves, and identifies the product and facilitates handling and commercialization (Vidales Giovannetti, 1995, cited by Ampuero et al., 2006).

Perceptions: Perception is the cognitive impression formed of “reality” which influences the individual’s actions and behavior toward that object (Baines et al., 2019).

Plain packaging: Packaging with removed colors, design features, and brand elements to increase the visibility of textual warnings. Simple text and in this study, colored in brown.

Prospect theory: Describes how people make decisions in situations of uncertainty and risk and how they value gains and losses. Gain-framed messages focus on the benefits of engaging in the desired behavior (e.g., “If you quit using Nicotine pouches, you will gain lifetime”). In contrast, loss-framed messages focus on the negative consequences involved in failing to adopt the desired behavior (e.g., “If you continue to use Nicotine pouches, you will lose lifetime”) (Nan et al., 2018, cited by Nurit Nobel, 2022). This is further explained in the literature review.

Snus: Swedish moist snuff. Swedish snus is a heat-treated oral moist snuff tobacco product originally developed in Sweden. Swedish snus mainly consists of air-cured tobacco, water, and salt (Review of the Scientific Literature on Snus (Swedish Moist Snuff), 2010). We refer to snus as a word for tobacco-free nicotine pouches and tobacco-snus.

Tobacco-free Nicotine Pouches (NP): Tobacco-free nicotine snus, also commonly referred to as “white snus” or “nicotine pouches,” (NB, we will refer to nicotine pouches as NP throughout

the thesis as a shortening of nicotine pouches). As for tobacco snus, NP are sold in pre-portioned pouches. However, they are filled with a white nicotine-containing powder instead of tobacco leaves, which is the main difference between tobacco-snus and tobacco-free NP (McEwan et al., 2021). The difference between NP and tobacco-snus is addressed in the introduction of the thesis.

Young adults: In this study, individuals aged 18-35 in Sweden.

1. Introduction

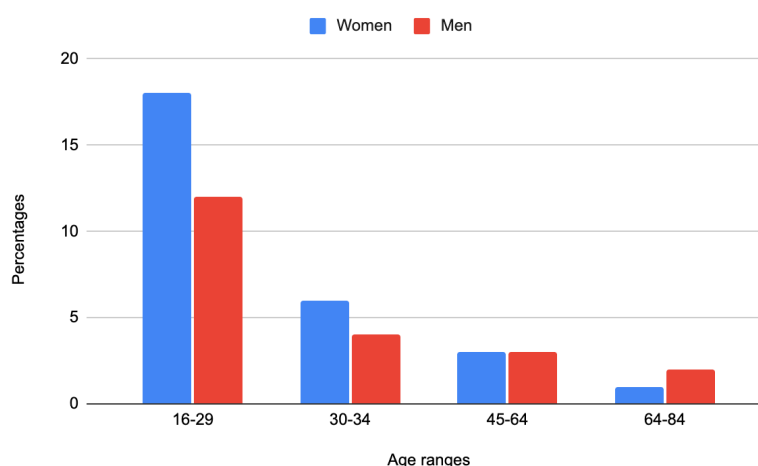
This section of the thesis discusses the phenomenon of nicotine pouches in Sweden by introducing the current trends of the product concerning use, laws, and conceptions. Then, the problem and purpose of the research are presented, along with its implications and delimitations.

1.1. Background

1.1.1. Overview of trends and regulations concerning nicotine pouches

Tobacco-free nicotine pouches, also commonly referred to as “white snus” or “nicotine pouches” (referred to as NP throughout the thesis), is a product that originated in Sweden and has become popular in recent years, especially among young adults and women (Folkhälsomyndigheten, 2022) (See Figure 1 for insights of usage). On August 1st, 2022, an age limit of 18 years was introduced for so-called tobacco-free nicotine products¹, including NP (Konsumentverket, 2022). Other ongoing changes in laws and regulations and the impact NP products have on the health of young adults have triggered our interest in studying the conceptions around the phenomenon of NP.

Figure 1. The percentage of individuals aged between 16-84 reported daily or occasional use of nicotine snus, divided by age and gender.



Note: From the national public health survey, Public Health Agency of Sweden (PHAS)

The history of snus stretches back to the 14th century, spreading from the Caribbean into the French court and Europe. Swedes began to put mixed tobacco leaves with salt and water under their upper lip, already in the 16th century. The product had high status, and the packages were made of gold, silver, and other valuable materials in the 17th century. The phenomenon grew, and less than fifty years ago, loose snus was common (Swedish Match - Snusets Historia, 2016). As new products were developed and launched on the market, people started consuming

¹ Nicotine derives from the tobacco plant.

“portions” (“prilla” in Swedish), or pouches, of snus containing both tobacco and nicotine. Today, manufacturers propose many variations in the types, flavors, and brands, and the market is expanding fast (Swedish Match - Snusguiden, 2023). Despite nicotine pouches only existing on the Swedish market for less than a decade, it is already the most frequently used tobacco-free nicotine product (Visir, 2022). The increase in the use of NP among high school students in 2022 was significant compared to the previous year, 2021. In 2022, the percentage of high school students who had used NP at any time was 39 percent for boys and 42 percent for girls, an increase of 20 percent and 13 percent compared to 2021. 22 percent of both boys and girls had used NP during the last month (Centralförbundet för alkohol- och narkotikaupplysning, 2022).

Before 2022, the sales and marketing of NP were not regulated by any law. In August 2022, the Swedish Parliament introduced a new law for tobacco-free nicotine products to mitigate the health risks associated with such products and primarily protect children and young people. As a part of this decision, The Public Health Agency of Sweden (PHAS) was tasked to create regulations in the field and develop supervision guidelines and communication efforts. They have published guidance for municipalities concerning age verification in sales. Furthermore, an age limit of 18 years was introduced for tobacco-free nicotine products, and a prohibition on targeting marketing to people under 25 (stipulated in the Swedish Code of Statutes, also called SFS 2022:1257), including NP. Restrictions on the design of the packaging and the marketing of NP were strengthened to make the products less appealing to young adults (Centralförbundet för alkohol- och narkotikaupplysning, 2022). The Swedish legislation for tobacco-free nicotine products is being examined further and is planned to be updated in 2023. The new regulations on tobacco-free nicotine products will include the design of the health warnings and the list of contents (Folkhälsomyndigheten, 2022). See Appendix 1.1 for further details about regulation changes.

1.1.2. What are nicotine pouches?

A framework that can analyze the competitive climate of an industry is Porter’s five forces, which identify five fundamental forces that can affect competitiveness. One of these forces is substitutes which perform the same or similar function as products in the industry but by different means (Porter, 1979). Tobacco-free nicotine products such as nicotine pouches or e-cigarettes can be seen as substitutes for tobacco products as they serve a similar purpose, e.g., the feeling of calmness from nicotine (Hur Ser Ungdomar På Snus? 2022). Indeed, both NP and tobacco products are composed of nicotine which is the addictive component that causes the release of dopamine in the brain (Benowitz, 2009) which gives a feeling of reward (Juárez Olguín et al., 2016). Traditionally, Swedish snus is a moist brown tobacco product, either served loose or in a pouch, enabling the user to place the product under the upper lip against the gum. The oral mucosa absorbs the released nicotine (McEwan et al., 2021). Similar to traditional snus, NP is sold in pre-portioned pouches, which are put between the lip and the gum (Robichaud, Seidenberg, & Byron, 2020). Instead of tobacco leaves, they are filled with a white nicotine-containing powder which is the main difference between tobacco-snus and tobacco-free NP. See Appendix 1.2 for more details about the content.

Several factors influence young people to use NP, some of which were brought up in an article published by Folkhälsomyndigheten in April 2022. They conducted a qualitative study to understand how adolescents and young adults perceived NP. They found that the price and the availability of NP were reasons respondents used the product, but also the varying flavors of NP increased appeal. Indeed, NP comes in various flavors, which seems to incentivize young people to try them. Moreover, NP is perceived as a healthier, more trendy, and fresh alternative to smoking (Hur Ser Ungdomar På Snus? 2022).

1.1.3. Health risks associated with nicotine pouches

NP contains nicotine, one of the most prominently studied substances in pharmacology. Nicotine is a highly addictive, toxic substance and is associated with health risks. Using NP can cause short-term effects on heart rate and blood vessels, as well as oral cavities and respiratory system irritation. Experimental animal studies indicate nicotine may promote already-initiated cancer development (Norwegian Institute of Public Health, 2014). Research by a cardiologist at Danderyd Hospital and associate professor of cardiology at Karolinska Institutet shows that nicotine can cause increased vascular stiffness, associated with an increased risk of stroke and heart attack (Danderyds Sjukhus, 2017 cited by Hjärt-Lungfonden, 2022). See Appendix 1.3 for a discussion of risks associated with the product.

1.2. Problem Area

As presented above, nicotine pouches have become popular in recent years (Folkhälsomyndigheten, 2022), making the reasons behind their popularity interesting to study and understand further. In one of their studies, Lund and Scheffel found that participants associated NP with candy, cosmetics, or chewing gum due to the packaging's colors, sizes, flavor additives, and fonts. They found that packaging fulfilled a similar promotional role as advertising messages because they generated appeal. They concluded that product packaging was becoming an increasingly important method to affect consumer behaviors. It is seen as a powerful communication tool that can affect the perception of health risks, strength, and acceptance of snus (Lund, Scheffels, 2017). In line with these conclusions, countries like Australia and Norway have introduced plain cigarette packaging to decrease product appeal. Theories in the field of behavioral economics, like nudging and prospect theory, are relevant when studying the effect of packaging design and warning messages on products. Nudging gives insights from behavioral research to design new policy tools to affect individuals' behavior (Andersson & Almqvist, 2022). Studies on smoking cessation have tested message framing with respect to Prospect theory (e.g., a study by Toll et al., 2007), where warning messages were phrased either as a gain or a loss.

To our knowledge, no previous research investigates the effect on younger adults of different packaging (plain vs. non-plain) and message framing (gain vs. loss-framed) on nicotine pouches in Sweden. Therefore, we considered (i) the lack of experimental studies on NP, (ii) the increasing use of NP by young adults in Sweden, along with (iii) the planned changes in regulations concerning product design and warning messages when defining the main area of

study for this thesis which is: to understand how plain packaging and message framing affects individuals' conceptions and intentions to use NP, by applying behavioral science theories such as prospect theory and nudging theory.

1.3. Purpose

This thesis aims to understand better the phenomenon of nicotine pouches using behavioral theories. It has three primary objectives. The first objective is to contribute empirical knowledge about the perceptual impact of gain- versus loss-framed messages on nicotine pouches among young adults aged 18-35 in Sweden. The second objective is to discover the individual effect of plain packaging for NP products to see how that affects conceptions and intentions among individuals between 18-35. Along with this, it's of interest to examine attitudes towards NP as of today without manipulating product design. The third objective is to explore the potential interaction effects of altering both the warning messages and the packaging.

Based on the problem area, the purpose of this study is to, through quantitative research, (1) explore how the type of packaging and/or a gain versus a loss-framed message affects young adults' conceptions and intentions to use NP in Sweden, (2) understand whether regulations regarding decreasing the intentions to use nicotine pouches, especially among young adults, can be addressed through packaging and design decisions.

1.3.1. Research Questions

As presented above, the thesis intends to empirically examine conceptions and intentions to use nicotine pouches among young adults (18-35) in Sweden by changing product packaging and adding warning messages. The following research questions in this thesis are to be examined:

- What are young adults' conceptions and intentions toward nicotine pouches in Sweden?
- How does plain packaging affect young adults' conceptions and intentions to use nicotine pouches in Sweden?
- How do gain versus loss-framed warning messages affect young adults' conceptions and intentions to use nicotine pouches in Sweden?
- What are Swedish young adults' conceptions about nicotine pouches when packages are plain and include gain vs. loss-framed messages?

1.4. Expected Contributions

The marketing of tobacco and alcohol products has been a recurring research topic. The ethical aspect of advertising addictive substances has been relevant for a long time. Packaging is an important aspect of companies' marketing strategy (Wakefield et al., 2002) and research on tobacco products packaging (Lempert et al., 2016; Wakefield et al., 2002) suggests that companies selling cigarettes are using packaging as a promotional tool to communicate brand

imagery and increase appeal. Even though tobacco and nicotine advertisement is regulated in Sweden, the packaging design of such products could replace the promotional role (Scheffels & Lund, 2017). Arguably, companies selling NP could have been using packaging as a promotional and marketing tool to increase appeal (Scheffel & Lund, 2017; Lempert et al., 2016). Consumers associate designs and colors with brands (César Machado et al., 2020). Thus, marketing managers should know how logo design and colors can influence brand perceptions. On the other hand, the use of warning messages or measures in altering the packaging is intended to reduce the use of tobacco and nicotine products (Folkhälsomyndigheten, 2023). Thus, product packaging and warning messages are areas of interest for research for similar addictive products such as NP.

Therefore, this thesis intends to contribute empirical knowledge in four ways. Firstly, we aim to map the current attitudes of young adults in Sweden concerning nicotine pouches compared to tobacco-snus. Secondly, we intend to empirically explore how plain or non-plain packaging affects young adults' conceptions and intentions to use nicotine pouches. Thirdly, based on behavioral theories, we intend to study how participants' conception and intention to use nicotine pouches are affected when shown a warning message implying a gain if quitting using NP or a loss if not doing so. A final contribution is examining the interaction effects of including message-framing and plain packaging. To the best of our knowledge, the interaction of the two manipulations of including a message and plain packaging of an NP pack has not been studied yet in Sweden.

From a marketing and strategy perspective, this thesis provides academic knowledge that can be used in further research to make educated and well-thought business decisions. Due to understanding young adults' current values and attitudes, marketers can make wise and well-adapted decisions with information on what seems to affect young adults' conceptions. Finally, the health debate around using addictive substances could perhaps be lifted through this thesis if it encourages more research on the topic. This, in turn, can guide marketers in adapting their efforts to the external market needs and individual behaviors in the long run as the phenomenon grows. This thesis serves as a supplement to existing research and welcomes more research on the topic. R&D investments could provide new solutions or improvements to current strategies.

1.5. Ethical Considerations

One may question the decision to write a thesis on a seemingly unethical product such as nicotine pouches, causing addiction and health risks like tobacco and alcohol. However, we argue it is vital to address this product and industry for three main reasons. First, research on NP can lead to increased awareness. In other words, this thesis aims to provide empirical knowledge about the conceptions and intention to use nicotine pouches, raising the health debate around the product by encouraging research on a product that is becoming increasingly popular and normalized, especially among young people. Research on nicotine pouches in Sweden is minimal compared to smoking, leaving room for more.

Secondly, studying and understanding individuals' opinions, intentions, and attitudes towards NP can also provide valuable insights for public health professionals interested in how packaging and messages can be formulated for other goods, such as candy or energy drinks in Sweden. Although the results may not be directly generalizable, elements of our thesis could provide further interest or insight into how behavioral science can be used to analyze decision-making processes or perceptions of other addictive or dangerous products. The third reason that NP is chosen as a topic is that the regulations and laws are under development. Therefore, it is very appropriate timing to look into tobacco-free industry control as the research, knowledge, and laws are primitive and under development. In other words, we believe our gathered empirical knowledge can be linked to practice related to ongoing events.

GDPR and ethical considerations are of great importance for this thesis. Questionnaire questions have been defined with close attention to The General Data Protection Regulation, GDPR (European Union, 2016). All data from the questionnaire sent out has been collected according to this regulation. Respondents had to give their consent to participate in the study. This is further discussed in the methodology.

1.6. Delimitations

There are several delimitations to this thesis. First, the empirical experiment was not allowed to ask participants whether they were using nicotine pouches, as questions about health and health issues can contain sensitive information contradicting the GDPR rules. Instead, respondents were informed that their previous knowledge or experience with the product did not matter in responding to the questionnaire. Secondly, the thesis focuses on Swedish-speaking people living in Sweden. The questionnaire was formulated in Swedish as our target group of young adults (18-35) living in Sweden, meaning that only Swedish speakers and/or people who have learned Swedish were eligible to reply. The reason for this was not to lose potential participants from our target group that could not answer in another language than Swedish and not to lose quality in the translation and the understanding of the question by the respondents.

Another delimitation of this thesis is that it only investigates young adults. As mentioned, every fifth person of the Swedish population between 17-29 years old declares having used NP once during the last 30 days, and product awareness is high among young adults between 18-29 years old (Folkhälsomyndigheten, 2022). Therefore, we choose to focus on individuals in this age group (18-35) as it is both the company's main target group producing and selling NP and an important group regarding addiction issues.

As discussed above, NP products differ from tobacco snus or other tobacco-free nicotine products in how it is designed and branded and in what it contains. The thesis will solely focus on NP (nicotine pouches, also called nicotine snus or white snus) and will not study other snus products such as tobacco snus or nicotine-free snus or other tobacco-free nicotine products such as e-cigarettes.

Moreover, specific brands will not be named in the experiment because the focus is instead on the phenomena NP in itself, mainly disregarding brand images. Many studies show that the brand logo affects individuals' conceptions of product attributes. For example, (Henley et al., 2011) provides insights into how perceptions change in a blind taste test of wine, where the brand logo was either included or not. The flavors of fruit characteristics were perceived as stronger for the ones who saw the label. Moreover, (César Machado et al., 2020) provide practical guidelines concerning logo design. They discuss font and product color as factors affecting brand perceptions. Therefore, we decided to blur the brand name on all experiment versions to minimize the risk of brand bias.

Another delimitation to consider is the type of theory that will be used to formulate the warning messages. The chosen behavioral theories that will be used are described in the literature review, where the reasons behind using specific theories are discussed. Finally, due to limitations in time and resources, we do not aim to explore alternative policies such as increasing taxes, information campaigns, or forbidding the use that may affect the perception or intention to use NP.

2. Literature Review

This thesis examines how packaging and the framing of warning messages on nicotine pouch packaging (NP packaging) affect young adults' conceptions and intentions to use NP in Sweden. In this part of the thesis, hypotheses are formulated based on behavioral research and prior literature to answer our research questions.²

2.1. Introduction

As mentioned in Introduction, nicotine pouches (NP) have seen significant growth this last decade (Folkhälsomyndigheten, 2022), thus, previous research on nicotine pouches in Sweden is limited. To our knowledge, there is limited research on the impact of packaging and message framing of warning messages on NP in Sweden. However, extensive research exists about the impact of warning messages on tobacco products such as cigarettes and tobacco snus, which can be seen as substitutes to NP for this study (following Porter's model, 1979). Thus, in this thesis, we assume that research on smoking and tobacco snus behaviors can be compared to nicotine pouch behaviors since these behaviors are addictions.³

2.1.1 Previous research on plain packaging

Packaging plays a significant role in consumer buyer intentions, and it is the first thing consumers see before buying the product (Vidales Giovannetti, 1995, cited by Ampuero et al., 2006). It is an essential factor influencing consumers' purchase decisions (Mazhar et al., 2015). Thus, packaging could be used as a form of product promotion. Research from the tobacco literature shows that packaging plays a crucial role in product promotion by strengthening brand image, creating positive product associations, and increasing appeal (Cummings et al., 2002; Lempert et al., 2016; Hoek et al., 2012; Wakefield et al., 2002; Moodie et al., 2010 cited by Goodman et al., 2021). Even though tobacco and nicotine advertisement is regulated in Sweden, the packaging design could replace the promotional role (Scheffels & Lund, 2017).

Previous research on plain packaging for tobacco products has shown that plain packaging affects individuals' smoking and snus cessation and that plain packaging is associated with a lower product appeal (Wakefield et al., 2013; White V et al., 2015; Aleyan S et al., 2020, Wakefield et al., 2014; Mucan et al., 2018). A study from 2012 examining young people's perceptions of cigarette plain packaging (Moodie et al., 2012) found that participants rated plain packaging negatively. They suggested that plain packaging would reduce young people's

² The primary sources used for literature research were SSE Library, Scopus, and the Nicotine & Tobacco Research Journal. The following keywords were used; *Health warnings, *Plain packaging, *Framing, *Prospect theory, *Nudging, *Nicotine, and *Smoking cessation.

³ Although NP is marketed as "tobacco-free", nicotine derives from the tobacco plant, thus, it is misleading to say that NP are "tobacco-free". Additionally, nicotine is the addictive component in both tobacco products and nicotine products which causes the release of dopamine in the brain (Benowitz, 2009) which gives a feeling of reward (Juárez Olguín et al., 2016). Therefore we make the assumption that tobacco products and NP products that tobacco behaviors can be compared to NP behaviors.

misleading idea of positively associating the colors of the packaging with a healthy product of good quality. After the introduction of plain packaging for cigarettes in Australia, there was a sustained increase in the number of calls to the smoking cessation helpline (Young et al., 2014), suggesting the negative effect of plain packaging on consumers' intentions.

To summarize, previous research suggests that plain packaging decreases product appeal and increases smoking cessation. In light of previous research, we have formulated the following hypotheses:

H1a: Plain packaging will lead to the nicotine pouch product being perceived as less appealing compared to Non-Plain packaging.

H1b: Plain packaging will lead to greater perceived likelihood of nicotine pouch cessation compared to Non-Plain packaging.

H1c: Plain packaging will lead to a decrease in the level of intent to continue to use the nicotine pouch product compared to Non-Plain packaging.

2.1.2. Warning messages for tobacco and tobacco-free products in Sweden

Warning messages on tobacco products aim to reduce tobacco and nicotine use (Folkhälsomyndigheten, 2023). For tobacco products in Sweden, there are several regulations⁴ concerning warning messages (Folkhälsomyndigheten, 2022). However, the regulations for tobacco-free nicotine products such as nicotine pouches (NP) in Sweden are much lighter and close to none. As mentioned in the Introduction, regulations about the advertising and marketing of NP exist. However, regulations about how to design warning messages are limited and under development. The Swedish legislation states that NP products should have the following warning message: "This product contains nicotine which is a highly addictive substance" but there are no laws about how to design the packaging and the message (see Appendix 1.1 for more information about the regulations).

2.1.3. Previous research about warning messages on tobacco products and tobacco-free products

A substitute is a product that performs a similar function as products in the industry but by different means, thus, NP could potentially be considered a substitute for tobacco products such as cigarettes or tobacco snus. Previous research (Cameron et al., 2015; Hammond et al., 2006; Hammond et al., 2011) suggests that warning messages on tobacco products enhance fear-related reactions, increase awareness and cessation, and reduce smoking behaviors. Warning messages on tobacco products effectively increase knowledge and awareness of the health risks associated with tobacco use and motivate behavior change among smokers and non-smokers. In a study (Mays et al., 2015) aiming to examine the effects of electronic

⁴ Combined health warnings are mandatory for packaging cigarettes, roll-your-own, and waterpipe tobacco. If the tobacco product can be burned and consumed, smoking cessation information (i.e., information about discontinuing tobacco smoking) should also accompany the health warning.

cigarette warnings on young adult non-smokers' perceptions and behavioral intentions, the authors found that text-based warning messages influenced young non-smokers' perceptions in a way that may dissuade their e-cigarette use.

Research shows that pictorial warnings⁵ have a greater effect than textual warnings (Noar et al., 2016; Hammond, 2006). Moodie et al. (2021) show that pictorial warnings on plain cigarette packaging increase warning salience and effectiveness. Since there is limited research regarding the harmful consequences of using NP, there are no available pictorial warnings for NP; thus, we chose to limit ourselves to text warning messages.

2.1.3. Previous research about Nicotine Pouches

As previously mentioned, research about Nicotine Pouches is limited and, until now, has focused on gathering quantitative and qualitative insights on the usage and risk perception of nicotine pouches by younger consumers. In a study about awareness, use, and perceptions of nicotine pouches among Dutch adolescents and adults, Havermans et al. (2021) state that their study is “one of the first to investigate awareness and use of [...] nicotine pouches in Europe”. Looking at young adults in the U.S., Morean et al. (2023) find a disproportionately favorable perception of NPs versus tobaccos snus by young adults in line with other studies (Denlinger-Apte, 2021) and discusses the potential positive impacts of nicotine pouches (as a way to quit smoking tobacco products) versus their potential negative impacts (initiating new consumers into nicotine addiction). Finally, Prasad et al. (2022) conducted quantitative research about the behaviors of consumers of NP in Sweden, Germany, Switzerland, and Denmark, but here again only to gauge the size of the usage and perception, not to test ways of affecting conception or intention to use.

2.2. Insights from behavioral research

For this thesis, we have examined behavioral research, including prospect theory and literature about nudging. We will start by presenting the prospect theory and its insights and then describe the nudging theory.

2.2.1 How people value losses and gains

The Prospect theory, introduced by Daniel Kahneman and Amos Tversky in 1979, explains how people make decisions in situations of uncertainty and risk and how they value gains and losses. The theory states that losses have a greater impact than gains, assuming people are more sensitive to losses and are loss averse. Kahneman and Tversky's papers on Prospect theory have been fundamental in decision theory, and Kahneman got awarded the Nobel Prize in economic sciences in 2002 (Nicholas C. Barberis, 2013). In their research, Tversky and Kahneman suggested that people have inconsistent preferences when the same choice is presented in different forms (Tversky & Kahneman, 1992). This theory has been effectively applied to designing persuasive messages in various domains (Kiene et al., 2005). For example,

⁵ The pictorial warnings included the ones suggested by the European Commission (Amending annex II, European Parliament 2014/40/EU) graphically showing the health consequences due to cigarette use.

it has been used in several studies to conceptualize how cigarette-related health messages influence risky decision-making (Tripp et al., 2021). In a study by Nurit Nobel, which tested the efficacy of different framing messages to reduce smoking behaviors (2022), prospect theory was used to formulate the warning messages on cigarette packages to study attitudes and behaviors and smoking cessation. How a health message is framed is essential in designing messages that promote preventive behaviors' (Gallagher and Updegraff, 2011, cited by Gisbert-Pérez et al., 2022). Since prospect theory provides the theoretical foundations for message-framing research, it is a relevant, suitable, and appropriate theory for designing warning messages.

Warning messages can be framed either as benefits (gains) or costs (losses) associated with certain outcomes of specific behavior, and the framing of such messages influences decision-making (Rothman et al., 1997, 1999). Gain-framed messages focus on the benefits of engaging in the desired behavior (e.g., "If you quit using Nicotine pouches, you will gain lifetime"). In contrast, loss-framed messages focus on the negative consequences involved in failing to adopt the desired behavior (e.g., "If you continue to use Nicotine pouches, you will lose lifetime") (Nan et al., 2018, cited by Nurit Nobel, 2022). According to the Prospect theory (A. Tversky & D. Kahneman, 1981), messages advocating a low-risk behavior are most effective if they stress the benefits of adherence (gain-framed). In contrast, messages advocating a risky behavior are most effective if they stress non-adherence costs (loss-framed). This means that when behaviors have a relatively certain outcome, individuals are more persuaded by gain-framed messages; when behaviors have an uncertain outcome, loss-framed messages are more persuasive (Detweiler et al., 1999). Thus, according to the prospect theory, gain-framed messages will be more persuasive than loss-framed messages when attempting to encourage smoking cessation since quitting smoking is linked to preventing health problems with certainty (Toll et al., 2007; Nurit Nobel, 2022). In this study, we want to see the effects of message framing when attempting to encourage nicotine pouch cessation. Several studies (Toll et al., 2007; Cornacchione & Smith, 2014; Schneider et al., 2001) have demonstrated that gain-framed messages worked better (compared to loss-framed messages) in promoting smoking cessation. Thus, since quitting NP is linked to preventing health problems with certainty, gain-framed messages will be more persuasive than loss-framed messages when attempting to encourage NP cessation, according to prospect theory and prior research on framing.

An article by Rossiter (2019) which criticizes prospect theory, states that loss aversion was developed much earlier than Tversky & Kahneman seem to acknowledge and that the roots of this concept are in the psychology of perception and learning theory, which the authors overlook. Moreover, Rossiter argues that the theory makes it seem like there are always two choices between two prospects, which is too narrow. Another criticism raised is that the original theory does not consider involvement, as high involvement versus low involvement decision processes can differ. Moreover, a study by Nwogugu (2005) shows that decision-making is complex; it requires information processing and cannot be defined accurately by quantitative models such as prospect theory. In short, prospect theory is criticized

for claiming psychological theories without explaining the psychological mechanisms behind them. Moreover, it can be seen as too narrow and impractical in some contexts.

2.2.2 Insight into nudging literature

The term nudge came from behavioral economics and was popularized by Thaler and Sunstein (2008), who define *nudging* as “any aspect of the choice architecture that alters people’s behavior predictably without forbidding any options or significantly changing their economic incentives” (Thaler, Sunstein, 2008). Thus, plain packaging and warning messages are nudges, according to Alberto Alemanno (2012). There is evidence for the effectiveness of nudge interventions to change a range of behaviors, including the consumption of tobacco, alcohol, and food. Reynolds et al. (2019) found that public acceptability for nudges to improve population health is generally favorable. More specifically, they found that labeling was the most acceptable policy and that tobacco use was the most acceptable behavior to be targeted by policies. Nudging theory has been criticized for ethical concerns (Wilkinson, T. M. 2013; Rebonato, 2014) and whether it can be considered an act of manipulation.

To summarize, previous research suggests that warning messages affect individuals' conceptions and intention to use tobacco products, and insights from behavioral research show that message framing affects consumers too. Therefore, we propose the following hypothesis:

H2a: A Gain-framed message will lead to the nicotine pouch being perceived as less appealing compared to a Loss-framed message.

H2b: A Gain-framed message will lead to greater perceived likelihood of nicotine pouch cessation compared to a Loss-framed message.

H2c: A Gain-framed message will lead to a decrease in the level of intent to continue to use the nicotine pouch product compared to a Loss-framed message.

H2d: A Gain-framed message will be perceived as more effective when it comes to informing about negative consequences compared to a Loss framed message.

2.3. Interactions

In addition to the previously mentioned hypothesis, we want to analyze the effect of interactions between plain packaging (vs. non-plain) and message framing (gain vs. loss). As previously mentioned, there is limited research analyzing the interaction effect between message framing and plain (vs. non-plain) packaging of NP in general in Sweden. One study analyzing the interaction between packaging and framing (Mayes et al., 2015) found that gain-framed warnings on plain packaging generated greater motivation to quit smoking than loss-framed warnings on plain packaging. Another study (Johnson et al., 2021) analyzing the interactions found that gain and loss-framed messages were equally effective in reducing cigarette appeal, especially on plain packaging. Due to constraints and limitations of analyzing interaction effects (Wesel et al., 2015; McClelland et al., 1993; Garofalo et al., 2022), we will not formulate any hypothesis on the interaction effects. Since prior research is lacking and an

interesting topic for future research, we will analyze these interactions in an explorative way (see the Explorative part in the Discussion for more details).

2.4. Individualism vs. Collectivism

Whether an individual is individualistic or collectivistic can affect their perception of packaging and message framing. Individualism vs. Collectivism is one of the dimensions in Hofstede's framework aiming to understand cultural differences, such as differences across countries (Blomberg, 2020). Kahan (2006) proposes that individualists are more reluctant to external control as they see them as intrusive to freedom, therefore, less accepting of policies. Dan Kahan's Cultural Cognition World View Scale can help assess if a person has an individualistic or collectivistic orientation. A study by Gustav Almqvist (Almqvist, 2020), investigating nudges' approval and the rationale behind nudges found that individualists disfavored nudging more than collectivists. This aligns with previous research on this topic (Västfjäll et al., 2015), showing individualists were less accepting of nudge policies. Thus, individuals with an individualistic worldview will be more negatively influenced by the manipulations in product design in this thesis. We will investigate using the existing assessment scales for individualism vs. collectivism.

3. Methodology

This section of the thesis presents the chosen methodology for responding to the research questions. We chose a quantitative approach and conducted an experiment with a questionnaire to collect and gather data.

3.1 Scientific Approach

3.1.1 Chosen method

Two epistemological positions that could have been taken to respond to the research question were either interpretivism or positivism. In this thesis, the positivism approach was chosen, which advocates using objective, scientific methods to study social reality (Bell et al., 2022). Thus, this thesis will follow a deductive approach where hypotheses are formulated based on existing research, as shown in the Literature Review. Data is then collected to test the hypothesis to either confirm them or not (Bell et al., 2022).

A quantitative, empirical research design using a questionnaire was used to gather data to answer the research questions. Our decision to use an experimental design was based on four reasons. Firstly, with a self-completion questionnaire, one can ensure that respondents stay anonymous. Since respondents' anonymity was crucial for this thesis for respondents to stay truthful, this method seemed appropriate. Secondly, we also wanted to conduct a between-subject study to randomly assign participants to various stimuli and compare the effects between groups which is possible with a quantitative, empirical research design using a questionnaire with a truly random allocation procedure. Moreover, our Literature Review shows that many other similar studies in the same research area used a quantitative research method with good reliability and validity, proving that this method is appropriate. Finally, this method was also an effective way to reach out to our target groups (adults 18-35) to get as many answers as possible within the time constraints.

3.1.2. Alternative Method

An alternative to the questionnaire would have been to use official statistics or do a secondary analysis. For example, using national survey data from Statistics Sweden (Statistiska centralbyrå). However, our research showed a lack of relevant external data for the level of detail required to answer our research questions. Moreover, the drawbacks would have been a lack of familiarity with the data and the complexity of the data, as suggested by Bell et al., (2022). Instead, a questionnaire was created with variables that suited the aim of this thesis.

A qualitative approach could have been appropriate if an interpretative approach had been chosen. Contrary to positivism, an interpretive view sees reality as subjective (Bell et al., 2022). Interviews with focus groups could have been conducted as a part of the qualitative method. They would have given us more in-depth insights into individuals' opinions on nicotine pouches. However, qualitative research can be seen as too subjective, and researchers'

personal views may influence the data collection, the analysis, and the interpretation which may lead to biased results. Qualitative research is also criticized for its lack of transparency, the difficulty to replicate such studies, and its problems of generalization (Bell et al., 2022). Moreover, considering our research questions, the aim was not to identify qualitative drivers in why young adults were using NP but rather quantitatively try to find differences in conceptions and intentions of young adults of different stimuli.

3.2 Pilot study

A pilot study was conducted to gather feedback on the quality of the questionnaire and see if the questions were well formulated before sending it out officially. Due to time constraints, the pilot study was sent to a small sample of 10 people who looked through the questionnaire from Monday, the 27th of March, to the 30th of March, 2023. The feedback was gathered orally. After gathering valuable feedback, such as suggestions on clarifying some questions, we updated the questionnaire accordingly.

3.3 Main Study

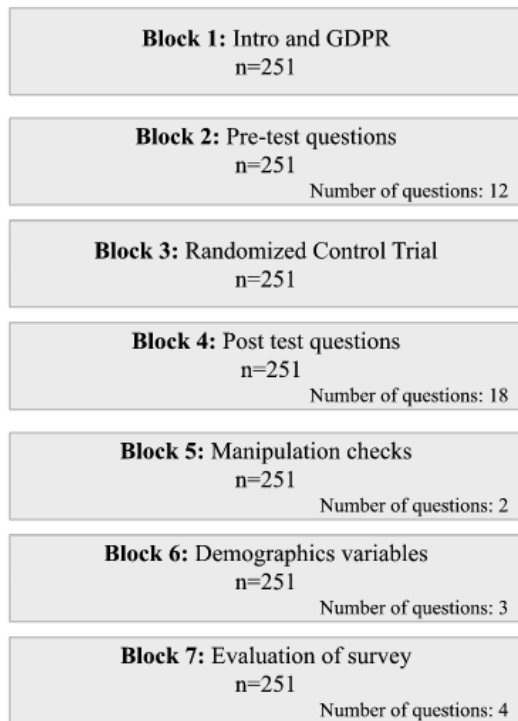
3.3.1 Materials

The questionnaire was developed in Qualtrics to ensure anonymous answers, which, as previously mentioned, was essential for this study. The questionnaire contained 39 questions divided into 7 Blocks (See Figure 2). An important aspect of the questionnaire was to be selective about what questions to use with careful consideration of the GDPR rules.

Before the respondents answered Block 1, they were greeted with a short presentation of the authors, and the aim of the thesis was presented. All respondents were informed of a donation of 2 SEK to “Barncancerfonden” (The Children’s Cancer Fund) for every complete response received. Thereafter, they had to consent to the GDPR rules in Block 1. The respondents who did not consent were immediately sent to the end of the questionnaire.

In Block 2, participants were provided with a definition of tobacco snus and tobacco-free nicotine pouches. Thereafter, perceptions and attitudes towards snus (both tobacco snus and tobacco-free nicotine pouches) were measured before the randomized control trial in Block 3 (RCT). There, they were asked to observe a package of NP carefully. Conceptions and intentions were measured in Block 4. An attention check asking the respondent to select an alternative was included in Block 4 to ensure the respondent was paying attention. Moreover, in Block 5 we used a manipulation check. In Block 6, participants were asked about demographics. At the end of the questionnaire (Block 7), participants were asked to evaluate the questionnaire. See Figure 2.

Panel A: Questionnaire flow



Panel B: Experimental design



Figure 2. Graphical explanation of the questionnaire flow (Panel A) and of the experimental design (Panel B).

3.3.2 Experimental design

To fulfill the aim of the thesis, a quantitative experimental study was conducted using a Randomized Control Trial (RCT) with a between-subject design in the questionnaire. Individuals who responded to the questionnaire were randomly assigned to one of five images of the nicotine pouch product. The five scenarios were (i) the Control package, (ii) the Non-Plain package with a Gain-framed message, (iii) the Non-Plain package with the Loss-framed message, (iv) the Plain package with a Gain-framed message, and finally, (v) the Plain package with the Loss-framed message (see Figure 2). See Appendix 2.2. for further details on the design of the packaging.

The design of the gain and loss-framed messages was inspired by Nurit Nobel's study about the interplay between benefit appeal and valence framing in reducing smoking behavior (2022). Table 1 shows the three different messages. The control package only showed the warning text required by the Swedish regulation as it looks today (control message). The non-plain gain-framed and the plain gain-framed packages had both the control message *and* the gain-framed message. The non-plain loss-framed and the plain loss-framed packages had the control message *and* the loss-framed message. See Figure 3, Table 1, and Appendix 2.2 to find more details about how the messages were designed.

Panel A: Control packaging



Panel B: Non plain - Gain framed packaging



Panel C: Non plain - Loss framed packaging



Panel D: Plain - Gain framed packaging



Panel E: Plain gain - Loss framed packaging



Figure 3. The five different scenarios: the control package (Panel A), The non-plain gain-framed package (Panel B), the non-plain loss-framed package (Panel C), the plain gain-framed package (Panel D), the plain loss-framed package (Panel E).

Table 1: The three types of messages.

Control message:	“This product contains nicotine which is a highly addictive substance”
Gain-framed message:	“If you stop using NP, you will save 65 000 SEK in 5 years”
Loss-framed message:	“If you continue to use NP you will lose 65 000 SEK in 5 years”

3.3.3 Procedure for data collection

The questionnaire was distributed as a link primarily on social media (Facebook, Messenger, and Instagram) and as a QR-code on KTH Campus and Campus Albano at Stockholm University (SU). The respondents we met physically who answered through the QR code received a small incentive, such as a soda drink or some candies, in exchange for completing the questionnaire. Additionally, all respondents were informed that their previous knowledge or experience using the product was irrelevant as all answers were of value for this thesis as long as they were aged 18-35. In addition, we communicated clearly that data was to be handled confidentially. Most approached individuals on the campuses replied to the questionnaire and seemed engaged in the chosen topic. Some asked questions about the thesis and had a positive attitude toward it.

One potential limitation of collecting answers physically was that respondents might have felt pressured to answer a certain way or finish the questionnaire quickly. To reduce this risk, we let the respondents answer the questionnaire in private as we walked away after they had scanned the QR code. We only responded to their questions after they had finished answering the questionnaire.

3.3.4. Variables

This section describes the variables defined and used in this study as well as the scales used to measure them. The questionnaire items and measurements were formed in the same manner as in prior research as much as possible and their scales were based on scales from the same original research. Most of our variables followed the 7-point Likert scale inspired by (Taherdoost, 2019), unless specified otherwise, with a for the respondent choice ranging from “Absolutely not correct” (1) to “Absolutely correct” (7). The reason behind some variables following different scales and answering options was feasibility. Additionally, when needed, all scale measures were translated into Swedish from the original language, English, then confirmed afterward by a native English speaker. All variables’ internal consistency measures of Cronbach’s alpha and composite reliability are presented in Appendix 2.3.

Independent variables

For each respondent, one of the five versions of the nicotine pouch product was shown during the RTC in the questionnaire. Each group (Control, Non-Plain Gain, Non-Plain Loss, Plain Gain, Plain Loss) has been defined as the independent variable in this thesis (see Figure 2 for experimental design).

Dependent variables

See Appendix 2.1 for more details about the formulation of the questions, statements, and scale alternatives, as well as further explanation for the elected measures.

Perceived Appeal. The following measurement was inspired by Cesar Leos-Toro and David Hammond (2019). Participants were asked: “How appealing would it be to try this product?” and the answers alternatives were presented on a 7-point Likert scale going from “Not at all”

(1) to “To an extremely high degree” (7). We used a Swedish scale inspired by Lennart Sjöberg’s research (Sjöberg, 1999).

Perceived likelihood of cessation. The perceived likelihood of cessation variable was inspired by Nilsen, C.V. et al. (2018). The answer alternatives for the question measuring this variable were stated as frequencies in Nilsen, C.V. et al. study. It seemed reasonable to include a question with frequencies as answer alternatives in our questionnaire (Gigerenzer, 1995). We asked the respondent the following: “Of 100 persons using snus regularly - how many do you think will stop using it after seeing the picture of the package shown earlier?”.

Intentions (multi-item). An index of respondents' Intentions was measured by three items. The following three items: “After having seen the nicotine snus package previously shown, will those you use nicotine snus: (1) Want to continue to use white snus in the future? (2) Want to reduce the use of white snus in the future? (3) Probably want to continue to use white snus in the future”. The second item (2) was reversed.

Perceived message effectiveness (multi-item). Perceived Message Effectiveness was measured using the UNC PME Scale (Baig et al., 2019). This brief scale is composed of three items: (a) discouragement, (b) concern, and (c) unpleasantness.

Background variables

Attitude towards tobacco snus and nicotine pouches. To measure the general Attitude of respondents towards tobacco snus and nicotine snus, the 7-point Likert scale ranging from “Very bad” (1) to “Very good” (7) was used.

Familiarity. Due to GDPR concerns and ethical reasons, we used proxy questions to try to understand the snus habits of the respondents, which we named “Familiarity.” The respondents were asked to estimate the price of NP and the number of pouches found in an NP package. The two proxy questions were as follows: “Do you know how much a tobacco-free nicotine snus package costs?” with the answer alternatives “Yes. Price (SEK)” (where the participant could enter the price), “Approximately,” “No” and “Please state how many portions there are in a tobacco-free nicotine snus package?” with the answer alternatives “Quantity:” (where the participant could enter the quantity) and “Do not know.”

Perceived Credibility. To measure Perceived Credibility (Hammond et al., 2019), we asked participants: “How believable are the product design and the warning?”. We used a 7-point Likert scale inspired by (Sjöberg, 1999): “Not at all” (1) to “to an extremely high degree” (7).

Perceived Branding. To measure Perceived Branding (Hammond et al., 2019), we used two questions measuring perceived brand imagery of the packaging.

Collectivist-Individualist (multi-item). The variable we used to measure “collectivist-individualist” was inspired by Kahan’s work (2008). A shorter version of Kahan’s (2008) “Cultural Cognition Scale” was used and formed a multi-item of 6 items.

Perceived Harm (multi-item). To measure the variable Perceived Harm we used five items inspired by Morean et. al’s (2023) study about nicotine pouches. Their measurement was based

on 14 items in which we replicated the formulations. However, we shortened all items to five after feedback from our supervisor and the pilot study.

Perceived Risk (multi-item). Three items inspired by Dryhurst et al. (2020) and (Sjöberg, 1999) measured respondents' risk perception index.

Demographics. The variables that measured respondents' backgrounds were age, gender, and main occupation. These measures were employed to enhance the understanding of potential differences in attitude and perceptions about NP regarding gender, age, and main occupation.

3.4 Data Analysis

3.4.1. Sample

The self-completion survey was distributed both physically (by sharing a QR-code at different college campuses (31.5% of respondents) and through different social media platforms (68.5% of respondents) from the 31st of March until the 12th of April. Since our target group was young adults between 18-35, it seemed suitable to visit different university campuses, such as KTH and SU, to find respondents, as many young adults study there. In total, we gathered 282 replies, and 251 were classified as valid and usable in the data analysis.

To select respondents, we used convenience sampling (Bell et al., 2022), as both probability sampling and quota sampling were not practically applicable in this study's time frame and context. Respondents in our sample have therefore been included based on their age (18-35), their willingness to participate, their availability at the time, and, in the case of respondents gathered on campuses, their geographical proximity. This non-probability sampling method implies limitations in how we can generalize the result of our survey. Still, as suggested by Bell et al. (2022), in the field of consumer behavior research, it has become the norm.

3.4.2. Data quality

When the questionnaire was closed, 282 participants had responded and had been shown and asked about one of the five versions of the nicotine pouch packaging following our Randomized Control Trial (RCT). Every respondent had answered the questionnaire in its entirety, which shows the high level of engagement of the respondents in the survey, confirmed by the oral feedback we received after they had completed the survey. In total, 31 respondents were removed from the data sample: some were removed because they did not give their GDPR consent, others because of failed attention and manipulation checks, and some due to age (>35). After excluding all the non-valid answers, a total of 251 answers were left to be used for the analysis.

To ensure the respondents had been successfully primed by the packaging image shown in the survey (Bell et al., 2022), we included a manipulation check where respondents were asked what color of packaging they had been shown during the survey. Most of the participants responded with the correct color (white or brown), and 0.7% did not. These respondents were excluded from the analysis.

3.4.3. Data analysis

To conduct the analysis, the data gathered in Qualtrics was analyzed in the statistical software R. We utilized descriptive statistics (means and standard deviations), composite reliability, and Cronbach's alpha to evaluate the internal consistency and reliability of the dataset, as recommended by Bell et al. (2022).

3.5 Reliability and validity

Two concepts for judging the quality of research are reliability and validity. Validity is the degree to which the questionnaire effectively measures what it is expected to measure, while reliability refers to the degree to which it produces consistent results (Söderlund, 2010). It is important to note that a study cannot achieve validity without reliability meaning that validity presumes reliability (Bell et al., 2022).

3.5.1. Reliability

A study's reliability measures how consistently the same methodology yields the same results in the same circumstances. Low reliability produces uncertainty about the level of consistency reached by the measured variables (Söderlund, 2010). This aspect holds particular importance for a quantitative study like ours (Bell et al., 2022). When assessing our questionnaire's reliability, we focused on internal reliability. The time frame of this study and the fact that it was anonymous did not allow us to measure stability through test-retest, and its nature was not adapted to inter-rater reliability.

To assess the questionnaire's internal reliability, Cronbach's alpha was used for the five parts of the questionnaire with multi-item questions, with questions ranging from three to six by multi-items. The reason was to verify that the items in each multi-questions were internally consistent in measuring the same factors. Cronbach's alpha ranges between 0 and 1, and the higher the value, the higher correlation between the items and, therefore, the higher internal reliability (Raykov, 2017). Bell et al. (2022) suggest that a Cronbach alpha above 0.7 can be interpreted as acceptable reliability. Similarly, Hair et al. (2019) state that a reliable level is above 0.7. However, other research argues that a value between 0.6 and 0.7 could be considered acceptable (Taber, 2017; Janssens, 2018).

As shown in Table 2, three of the multi-items of our questionnaire had a Cronbach's alpha higher than 0.7, while two showed a value higher than 0.6 but below 0.7. One of the main reasons stated by research for a Cronbach's alpha to be low is that there are too few items in the measured multi-item (Tavakol, 2011), the lowest being 3. Usually, the number of items in a multi-item measurement should be ranging between 6 and 12. In the case of our two multi-items with an alpha between 0.6 and 0.7, the number of items is 3, possibly explaining the lower alpha. For both multi-items, we used the Spearman–Brown prediction formula to predict the test length to obtain an alpha equal to 0.7 (W. de Vet, 2017). For Intentions, the

number of multi-items should have been increased by 1.5 and for Perceived Risk by 1.2, which shows that an alpha of 0.7 could have been reached by slightly increasing the number of items.

Considering the exploratory nature of our study, the acceptable nature of our multi-items' Cronbach's alpha, and the result of the Spearman–Brown prediction formula, we consider our questionnaire to be internally reliable.

Table 2: Cronbach's Alpha for the multi-items measurements of our questionnaire.

N = 251			
Variable	No. of items	Mean(sd)	Cronbach's alpha
Perceived Harm	5	3.9(0.99)	0.72
Perceived Risk	3	4.1(0.88)	0.65
Perceived message effectiveness	3	3.4(1.7)	0.91
Intentions	3	4.6(0.97)	0.61
Collectivist/Individualistic	6	4.3(1.00)	0.77

3.5.2. Validity

In the context of quantitative research, validity is meant to assess whether our variables correctly measure what they are intended to measure. It impacts the integrity of the conclusion generated in the present thesis as low validity generates uncertainty about how our measures are related to reality. There are several ways of testing measurement validity, such as the face (or content), concurrent, or convergent (Bell et al., 2022).

Content validity refers to how well the questionnaire measures the correct aspects of the measured concept. To secure content validity, and as described in the methodology, we defined all our measured variables using established measurement methods, questions, and scales from similar questionnaires about tobacco products or other related products. In this way, we ensured that our measurement methods aligned with proven research practices and methods.

As nicotine pouches are very new products, there is a lack of knowledge, research, and measurement that could be used to assess this study's concurrent or convergent validity. For concurrent validity, we compared our results to one of the few quantitative questionnaires done in the U.S. about the subject (Morean, 2023). Still, the comparison showed divergent results between the two questionnaires due to the difference in the tested population (US vs. Sweden). In recent years there have been several studies about younger Swedish people and nicotine pouches, but they are mostly focused on consumption. A government study (Folkhälsomyndigheten, 2022) showed that the use of nicotine pouches among younger women was much larger than their use of tobacco snus (18% versus 5%) which converges with our results concerning how less worse women see NP compared to tobacco snus (3,33 vs 1,82). We find another similar converging data when we compare the results of our questionnaire and the results of a questionnaire about Swedish young adults' views on tobacco products (A

Non-smoking Generation, 2021). In this questionnaire, 68% of respondents say they see nicotine pouches as less harmful than other tobacco products, in line with the result of our questionnaire where 66% agreed with the statement that NP was less harmful than tobacco snus.

In conclusion, we see that the validity of our measurements is supported by the fact that we defined our questions and measured variables from established research (content validity) and by the convergence of some of our measures with other studies (convergent validity).

3.5.3. Questionnaire evaluation

The final block of the questionnaire consisted of 4 items where the respondent would evaluate the questionnaire. The purpose of these items was to evaluate if the questions and answer alternatives were well formulated, if the questions tried to influence the respondent in a certain direction, and if the product design was realistic. 94,42% felt that the questions and answer alternatives were well formulated. 7,17% found that the questions tried to point the respondent in a certain direction. 90,83% found the product design realistic and 97,21% agreed that the questionnaire was about tobacco-free NP. An overview of the questionnaire evaluation is represented in Table 3.

Table 3. Overview of the questionnaire evaluation

Question	Absolutely incorrect	Mostly not	Either or	Mostly yes	Absolutely correct
The questions and answers were clearly formulated.	0.40%	5.18%	2.79%	47.81%	43.82%
The questions tried to influence my answers in any direction.	48.61%	25.50%	18.73%	6.77%	0.40%
The product was realistic.	1.99%	7.17%	8.76%	39.04%	43.03%
The survey was about tobacco-free nicotine snus.	2.39%	0.40%	1.99%	14.34%	80.88%

Note: N= 251.

4. Results and analysis

This part presents the empirical findings of the thesis. First, descriptive statistics are presented. Thereafter, we proceed with our hypothesis testing, employing 2 x 2 ANOVA tests and Tukey HSD tests. Afterward, we present further insights.

4.1 Descriptive Statistics

4.1.1. Overview sample demographics

In our sample, a majority of the 251 valid respondents from the questionnaire were females (57%), and the remaining 43% were males. The mean age for the respondents was 23.82. Furthermore, 68.53 % of the respondents were between the ages of 18 to 24, 21.12 % were between the ages of 25-29, and 10.36% in the ages of 30-35. A majority of the sample (71.7%) were students, and 23.1% were full-time employed. The non-representativeness of the sample has been acknowledged and justified in the Methodology.

4.1.2. Respondent's different levels of familiarity with Nicotine pouches

To determine respondents' familiarity with NP, respondents were asked to estimate the price of NP and the number of pouches found in an NP package. As stated in Methodology, the respondents were divided into three separate groups depending on their familiarity with the price of NP packaging and the number of pouches found in NP packaging. Thereby respondents have been defined as being "Very familiar with NP," "Familiar with NP," or "Not familiar with NP." Regarding their familiarity within the sample, 24.30% did not have any familiarity with NP, 51.39% were familiar with NP, and 24.30% were very familiar with NP.

This variable was used as a proxy to determine respondents' NP habits. The results of 24.30% of respondents being "very familiar with NP" is in line with the results from the CAN report (Centralförbundet för alkohol- och narkotikaupplysning, 2021) about daily and occasional users of NP.

See Appendix 4.1 for an overview of the descriptive statistics regarding gender, age, occupation, and familiarity.

4.1.3 What do respondents think about tobacco snus and nicotine pouches?

Overall, our findings suggest that young adults' attitude towards tobacco snus (brown snus) was worse than their attitude towards nicotine pouches (see the definition of the variable attitude in Methodology). Further, our findings show that women's attitude towards snus in general (both tobacco snus and NP) is rated worse than men's. The difference in means between women's and men's attitudes toward tobacco snus (women: 1.82, men: 2.94) was, however, more significant compared to the difference in means between women's and men's attitudes towards NP (women: 3.33, men: 3.80).

Our results show that all three age groups have a worse attitude towards tobacco snus compared to NP. Younger respondents (18-24: 1.96) have a worse attitude towards tobacco snus than those in the older age groups (25-29: 3.7; 30-35: 3.31). On the other hand, attitude toward NP is similar for all three age groups varying between 3.38 to 3.81. For the age group 18-25, the difference in means between their attitude towards tobacco snus compared to NP was significant, while for the age group 35-39, the difference in means between their attitude towards tobacco snus and NP was not significant. See Appendix 4.2.

The respondents with “no familiarity with NP” have a worse attitude towards tobacco snus and NP compared to the respondents with “good familiarity with NP,” who in turn have a worse attitude compared to the respondents with “Very good familiarity with NP.” Furthermore, the three groups have a worse attitude toward tobacco snus than NP.

See Appendix 4.3 for an overview of the different attitudes towards tobacco snus and NP.

4.2 How did the package and message influence participants' responses?

4.2.1. Analyzing the data

The aim of this thesis was to examine how the framing of messages and the packaging of the nicotine pouch product affect individuals' conceptions and intentions to use nicotine pouches. Tests used to examine the research question include two-way ANOVA and Tukey's HSD tests. Throughout this section, p-values with a significance level of 5% ($p < 0.05$) will be used to determine the significance of all performed tests.

4.2.2. ANOVA and Tukey's HSD test

To examine how the packaging affected individuals' conceptions and intentions to consume nicotine pouches, we analyzed the difference in means between the group Plain and the group Non-Plain. Similarly, to examine how the framing of the messages affected individuals' conceptions and intentions to consume nicotine pouches, we analyzed the difference in means between the group Gain-framed and the group Loss-framed. For these analyses, we conducted two-way ANOVA tests and Tukey HSD tests. The tests were conducted to determine if Plain or Non-Plain packaging and Gain or Loss framed messages had effects on Perceived Product Appeal, Perceived likelihood of NP cessation, Intentions to continue to use NP, and Perceived Message Effectiveness. See the results from the ANOVA test for all dependent variables in Table 4.

Table 4. Results from two-way ANOVA tests for different dependent variables.

Variable	<i>Sumsq</i>	<i>Meansq</i>	<i>F-value</i>	<i>p-value</i>
Perceived product Appeal				
Frame(Gain vs Loss)	3.9	3.86	1.96	0.16
Packaging(Plain vs Non-Plain)	36.2	36.21	18.37	<0.001***
Frame * Packaging	0.0	0.02	0.01	0.92
Perceived likelihood of NP cessation				
Frame(Gain vs Loss)	1.2	1.16	0.47	0.50
Packaging(Plain vs Non-Plain)	13.7	13.67	5.48	<0.005***
Frame * Packaging	0.8	0.77	0.31	0.58
Intention				
Frame(Gain vs Loss)	0.43	0.43	0.50	0.48
Packaging(Plain vs Non-Plain)	3.74	3.75	4.40	<0.005***
Frame * Packaging	0.48	0.48	0.56	0.45
Perceived message effectiveness				
Frame(Gain vs Loss)	0.2	0.16	0.06	0.80

Notes: The control group is not included in this ANOVA. *** Statistically significant since $p < 0.05$.

For Perceived Product Appeal, Perceived likelihood of NP cessation, and Intentions a p-value smaller than 0.05 was reported for the independent variable Packaging. This indicates a significant effect of Packaging on the dependent variables Perceived Product Appeal, Perceived Likelihood of NP Cessation, and Intentions.

The results suggest no significant effect of message framing on the dependent variables.

Tukey's HSD was then conducted for the three dependent variables with significant p-values for packaging to determine which specific groups differ significantly from each other. See plots for Tukey's HSD test in Appendix 4.4.

4.2.3. Plain vs. Non-plain

Tukey's HSD test found that the difference in means between Plain vs. Non-plain groups for the dependent variable Perceived Appeal was negative, indicating that the Plain packaging is less appealing than the Non-Plain packaging. Thus, H1a is supported.

Tukey's HSD test found that the difference in means between Plain vs. Non-plain groups for the dependent variable Perceived Likelihood of Cessation was positive, indicating that the plain packaging had greater judged probabilities to stop using NP compared to the Non-Plain packaging. Hence, H1b is supported.

Tukey's HSD test found that the difference in means between Plain vs. Non-plain groups for the dependent variable Intentions to use NP was negative, indicating that the Plain packaging had a lower intent to continue to use NP compared to the Non-Plain packaging. Hence, H1c is supported.

H1a	Plain packaging will lead to the nicotine pouch product being perceived as less appealing compared to Non-Plain packaging.	Supported
H1b	Plain packaging will lead to greater perceived likelihood of nicotine pouch cessation compared to Non-Plain packaging.	Supported
H1c	Plain packaging will lead to a decrease in the level of intent to continue to use the nicotine pouch product compared to Non-Plain packaging.	Supported

4.2.4. Gain vs. Loss

The results from the ANOVA test suggested that there were no significant differences in means in the groups Gain vs. Loss. Hence, H1a, H2b, H2c and H2d are not supported.

H2a	A Gain-framed message will lead to the nicotine pouch being perceived as less appealing compared to a Loss-framed message.	Not Supported
H2b	A Gain-framed message will lead to greater perceived likelihood of nicotine pouch cessation compared to a Loss-framed message.	Not Supported
H2c	A Gain-framed message will lead to a decrease in the level of intent to continue to use the nicotine pouch product compared to a Loss-framed message.	Not Supported
H2d	A Gain-framed message will be perceived as more effective when it comes to informing about negative consequences compared to a Loss-framed message.	Not Supported

4.3 Explorative analysis

In addition to testing the hypotheses regarding the effect of packaging (plain vs. non-plain) and the effect of message framing (gain vs. loss), we will empirically investigate the interactions of packaging and message framing. Although we could have had hypotheses for the interactions, we decided to limit ourselves for various reasons (see the Explorative part of the Discussion for more details). To analyze the difference in means between the different interactions, we conducted 2- way ANOVA tests on the whole sample and plotted the different dependent variables against each group. See Figure 4.

Although not statistically significant, we found that the mean of the variable “Perceived Appeal” for the plain-loss group is closer to 1 compared to the plain-gain group (see Panel A in Figure 4). This means that the individuals in the group plain-loss found the packaging less appealing than those in the group plain-gain. Moreover, although not statistically significant either, the results suggest that the mean for the variable “Intentions” for the group plain-loss is greater than the plain-gain group suggesting that the individuals in the plain-gain group thought fewer people would continue to use NP after seeing the packaging.

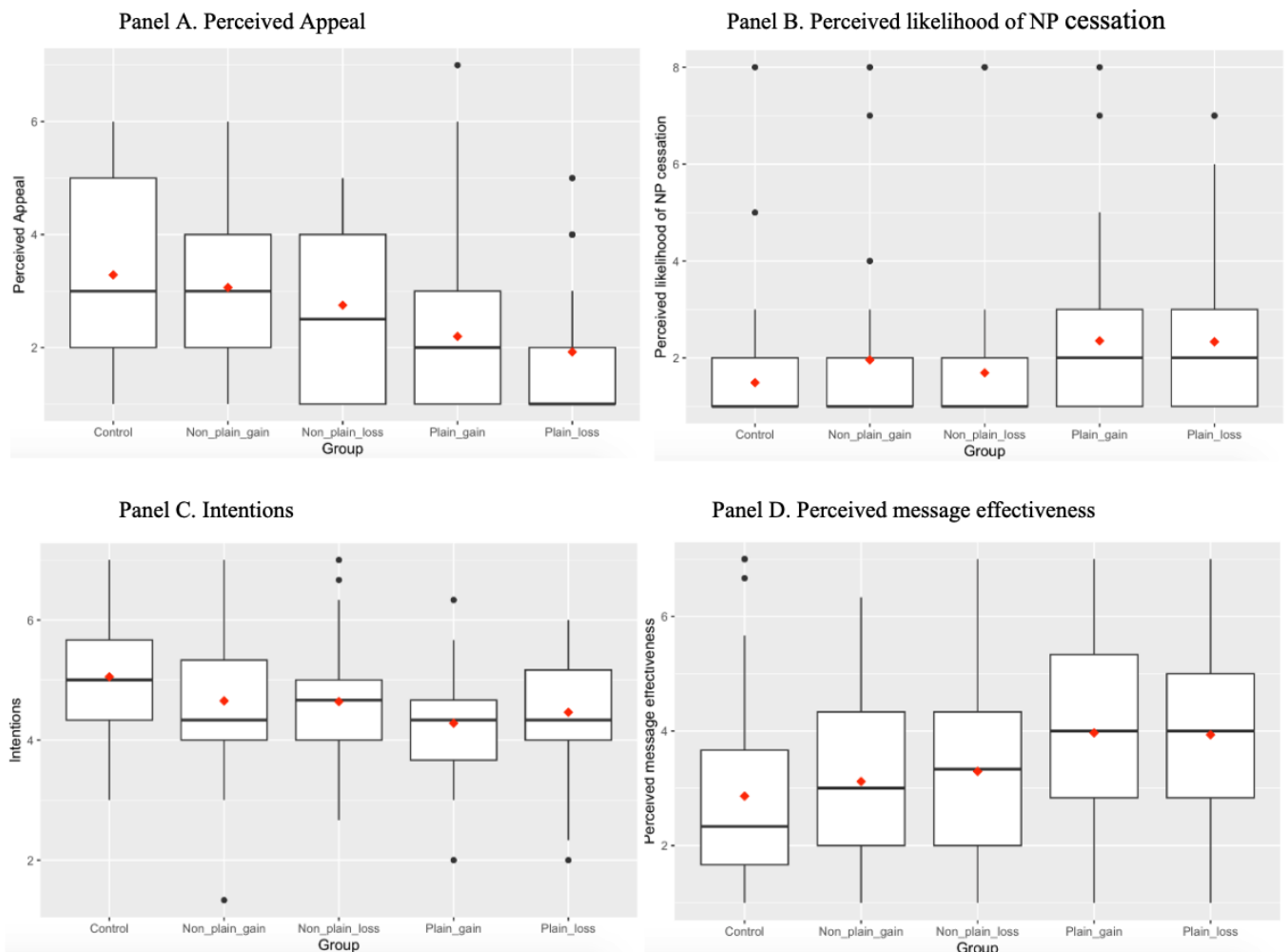


Figure 4. Boxplots for each dependent variable in each group with their respective mean represented by a red triangle.

4.4 Other research questions

To add to our main study, we wanted to examine how people perceived/conceived the nicotine pouch packaging as it is presented today and their intentions to use it. As previously mentioned in Method, one group of participants was presented with a control nicotine pouch product

resembling today's nicotine pouch packaging. We conducted two-way ANOVA tests to see if there were differences in means between the dependent variables in each group. We only compared the control with the non-plain gain group and the non-plain loss group. We found (at

a significance level of 1% ($p < 0.1$) a statistically significant difference between the means of the variable Intentions between the Control and the Non-plain Loss group. The results from the Tukey HSD test suggested that the non-plain Loss group scored less on Intentions suggesting that the non-plain loss group thought fewer people would continue to use NP compared to the group who saw the control nicotine pouch packaging. See Figure 4 for the different means in each group for each dependent variable.

4.5. Other insights

4.5.1 Analyzing perceived harm of nicotine pouches

As mentioned in Methodology we asked respondents to rate the perceived harm of nicotine pouches compared to tobacco snus.⁶ Results suggested that respondents perceived NP as more addictive (2.11) than they considered NP harmful to a person's health (5.57). 66%⁷ of the sample perceive NP as less harmful for health compared to tobacco snus, 35% perceive NP as less harmful for the heart compared to tobacco snus, and 6% perceive NP as less addictive compared to tobacco snus. The Cronbach's alpha of the indexed variable Perceived harm was 0.72, indicating good internal consistency and reliability. See Cronbach Table 2 in Methodology.

4.5.2. Analyzing respondents' risk perception

We asked respondents about their perceived risk of NP for users, their surroundings, and others. In general, individuals perceive the risk to the user as more important than the risk to the surroundings or others. The results show that the perceived risk to the user of nicotine pouches does not differ significantly between women and men.

See Appendix 4.6.

4.5.3. Collectivist/Individualist

To see if being more collectivist or individualist affected the dependent variables, we conducted a correlation analysis. We conducted correlations between each dependent variable and the collectivist/individualistic variable in each of the five groups (control, non-plain gain, non-plain loss, plain gain, plain loss). We found a statistically significant correlation between the variable collectivist/individualistic and the Perceived message effectiveness in the Non-plain gain group and a significant correlation between the variable collectivist/individualistic and the variable Perceived likelihood of cessation in the Non-plain loss group. See Appendix 4.7 for a correlation matrix for each group.

⁶ (1) Absolutely correct, (7) Absolutely incorrect

⁷ Includes everyone who responded "slightly correct", "correct", "absolutely correct".

5. Discussion

The purpose of this thesis has been to examine how packaging and message framing affect young adults' conceptions and intentions to use nicotine pouches (NP) in Sweden. The results presented in the previous chapter will be discussed in this section.

5.1. Key Findings & Implications

- Participants' attitudes towards nicotine pouches were significantly more positive than tobacco snus.
- Young adults perceived plain packaging as less appealing, perceived a greater likelihood of NP cessation for the plain packaging, and perceived lower intentions to use the plain packaging product compared to non-plain packaging significantly.
- There was no significant difference between the gain vs. loss-framed message. Individuals did not significantly perceive the gain-framed message as less appealing, nor perceived it as a greater likelihood of NP cessation, nor perceived lower intentions to use the product, and nor did they find the message more effective compared to the loss-framed message.
- There were no statistically significant differences between the means of the different interactions.
- Despite the following effect being insignificant, young adults' conceptions of NP were worse when they saw a packaging with a framed warning message (gain or loss) compared to the packaging without a framed warning message (the control).

5.1.1. Attitude towards nicotine pouches

The results showed that attitudes toward snus differed significantly between tobacco snus and nicotine pouches. Participants between 18-24 assessed tobacco snus as more negative compared to the older age groups, while the attitudes towards NP were similar between the age groups. Moreover, our results suggested that women's attitudes were significantly worse than men's towards tobacco-snus. The difference in means between the attitude towards tobacco and the attitude towards NP for women was more significant than the difference in means between the attitude towards tobacco snus and NP for men. This is seen in Appendix 4.3. These results align with the findings by the Public Health Agency of Sweden which show that women aged 16-29 use it more (see Figure 1 in the Introduction).

In the youngest age group, NP is seen as more positive than tobacco-snus, pointing towards popularity among young adults, as addressed by Folkhälsomyndigheten (2022). The comments from the open questions in this thesis' questionnaire reflect the respondents' rated attitude. Many young adults claim that they perceive both types of snus as bad. However, the NP is a *healthier, fresh* alternative due to flavors and decreased chance of teeth being stained relative to tobacco snus. Scheffel and Lund (2017) discuss that the color white is seen as healthier and

milder, a color that is commonly used for NP packages. This could suggest that people perceive NP as healthier due to the white color of the packaging.

5.1.2. The role of packaging and how it affects conceptions and intentions to use NP

The first objective of this study was to evaluate how packaging affects young adults' conceptions and intentions to use nicotine pouches in Sweden through an experimental questionnaire. The results suggest that plain packaging is perceived as less appealing than non-plain packaging and that plain packaging leads to a greater likelihood of NP cessation. Also, plain packaging leads to a lower intent to continue using NP. Thus, H1a-H1c are supported.

As predicted by Wakefield et al., 2013; White V et al., 2015 and more, plain packaging is associated with a lower product appeal and reduced intentions to use the product (Durkin et al., 2015; Hugh et al., 2017). The color of the plain packaging could explain this decrease in product appeal and intentions. Color on packaging can be seen as a marketing tool that attracts consumers and influences customers' purchase decisions and brand recall (Labrecque, 2011; Hammond et al., 2009; Rathee, 2019). It has been argued that dark colors elicit negative emotional associations (Hemphil, 1996) and that the color brown is perceived as neutral or negative (Clarke, 2007). In his study, Clarke explains that individuals lacked opinions and associations with brown and did not connect brown to any specific emotion. Our findings also go in line with Hammond et al. study (2009) that found that packs with lighter colors were rated as less harmful

Moreover, packages of light colors are associated with freshness and perceived as milder and healthier compared to the dark ones (Scheffel and Lund, 2017), indicating that darkening the package could communicate the strength of the product.

5.1.3. The effect of message framing on young adults' conceptions and intentions to use NP

The second main objective of this study was to evaluate how message framing affects young adults' conceptions and intentions to use nicotine pouches. The results show that message framing with either gains or losses did not significantly affect young adults' conceptions and intentions to use NP (H2a-H2d not supported).

Previous studies that have evaluated the warning message framing with respect to prospect theory found mixed results. Some studies (Gantiva et al., 2022) found that loss-framed messages are perceived as more effective and stronger in the argument, while some have found the contrary (Schneider et al., 2001). Prospect theory applied in studies (Toll et al., 2007; Rothman et al., 1997, 1999; Nurit Nobel, 2022) provides the theoretical foundation for research on message framing and suggests that gain-framed messages will be more persuasive than loss-framed messages when attempting to encourage smoking cessation since smoking is a prevention behavior with little associated risk or uncertainty. In our study, the certainty associated with the consequences of stopping to use NP is high, suggesting that individuals should be more persuaded by gain-framed messages (Toll et al., 2007; Detweiler et al., 1999).

However, our experimental study did not reveal significantly that gain-framed messages have a stronger effect than loss-framed messages. Moreover, our findings showed no significant results for the framing of either gain or loss messages, indicating that a framed (gain or loss) message on NP packages may not affect young adults' conceptions and intentions to use NP.

People's prior opinions and motivation to use NP may affect their responses. A study by (Toll et al., 2007) looking into the effects of message framing (gain vs. loss) on, e.g., smoking abstinence concluded that participants who had smoked longer seemed to be more responsive to the gain-framed messages, especially the ones who were actively engaged in a smoking cessation program. Thus, individuals who were already more motivated were more affected by the cessation intervention. Information about respondents' NP habits, e.g., potential willingness to quit, was not provided, but this could potentially influence their assessments (Toll et al., 2007; Sunstein, 2022), which is further discussed in the limitations.

Furthermore, a factor that could explain our findings could relate to the critique of prospect theory, claiming the loss aversion is context-dependent. Although previous studies have proven that gain-framed messages seem to mitigate smoking (Nurit Nobel, 2022 & Toll et al., 2007), we find it interesting to consider this fact, especially since the research on the topic of NP is limited. There could be better suitable theories to use when formulating messages. As discussed in the literature review, there is criticism against prospect theory of being too narrow and impractical, making it impractical for all contexts. Another factor that could influence the results is aesthetics.

Aesthetics can also affect perception. Romeo-Arroyo et al. (2023) found that a packaging's visual features and premiums influence the perception that participants in their study assessed. Moreover, symmetrical patterns were related to premiums in food packaging. Perhaps the level of symmetry in the photoshopped photos or letters of the packages in our experiment intervention affected their conceptions, and not just the framing of the messages, as symmetry can sometimes affect judgment.

5.1.4. Explorative discussion

In this study we decided not to formulate hypotheses on the interaction effects between packaging and message framing. Instead, we conducted an explorative interpretation of interaction effects (Garofalo et al., 2022) for several reasons. Firstly, more observations would be required to test all interactions reliably and robustly. Secondly, prior research shows that interaction effects are difficult to formulate, evaluate, and interpret and there are statistical difficulties in detecting them (McClelland and Judd, 1993; Wesel et al., retrieved 2023). Moreover, although some studies have analyzed these interactions (Mayes et al., 2015; Johnson et al., 2021), there is not enough empirical research or evidence that can help us predict the effect of the different interactions between each other.

Despite these limitations, we found interesting results concerning the variable's Intentions and Perceived Appeal. Concerning the variable Intentions, although our results were not statistically significant, we found that gain-framed messages on plain packaging had a greater effect on making individuals not want to continue to use NP compared to loss-framed messages

on plain packaging. This aligns with Mayes et al. research, which found that gain-framed warnings on plain packaging generated greater motivation to quit smoking compared with loss-framed warnings on plain packaging. For the variable Perceived Appeal, we found (not statistically significant) that individuals in the plain-loss group, on average, found the packaging less appealing compared to the plain-gain group, which contradicts previous research (Johnson et al., 2021) showing that gain and loss-framed messages were equally effective in reducing cigarette appeal on plain packaging.

5.1.5. Other findings

Perceived Harm

As seen in the Results, respondents perceived NP as addictive (2.11) but much less harmful to a person's health (5.57) and as nearly as addictive as tobacco snus but less harmful to health. This is an interesting finding considering that today's warning message on NP is about the risk of addiction to nicotine which seems not to be considered as something harmful by the respondents. This conclusion is similar to other studies (Havermans et al., 2021; Morean et al., 2023) and shows the importance of future warning messages on NP, not only addressing addiction.

5.2. Limitations

The present thesis has several limitations which should be acknowledged. Firstly, our convenience sample was neither a probability sample nor a quota sample which limits our possibility of generalizing the results of this study. Secondly, to increase reliability, we could have increased the number of items in our multi-items to increase their internal reliability. Similarly, to increase face validity, we could have contacted experts concerning our questionnaire to get their feedback about our measurements. Yet another limitation, as mentioned in the Methodology, is that this thesis could not gather information about whether the study participants actually used snus or not, as that could give information regarding a respondent's health due to GDPR. Knowing if a person uses NP or not could have been interesting to get deeper insights into the conceptions and intentions to use NP of the actual users of NP products (Toll et al., 2007).

5.3. Conclusion & Final Words

The Public Health Agency of Sweden is currently developing upcoming policies aiming to reduce the use of nicotine pouches, especially among young adults, by regulating product design. The purpose of this thesis was to empirically examine how packaging (plain vs. non-plain) and message framing (gain vs. loss) would affect young adults' conceptions and intentions to use nicotine pouches (NP). The results point towards plain packaging being effective in promoting NP cessation, reducing appeal and intentions to continue to use NP. However, message framing (gain vs. loss) did not significantly affect young adults' conceptions and intentions to use NP.

In line with previous research about tobacco snus and cigarettes, these results highlight the importance of packaging and how it impacts the attractiveness of nicotine products which could be an important insight for marketing decision-makers, policymakers, and public health organizations in Sweden. However, the design of the warning messages could be studied more to find which messages could impact individuals' conceptions and intentions to use NP and how to communicate the risks of this product efficiently. Gain and loss-framed messages about other consequences of NP than financial consequences could also be further studied, or potential illustrations communicating risks.

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7. APPENDICES

APPENDICES 1

APPENDIX 1.1. Overview of policies and regulations in the Swedish market.

In Sweden, tobacco-free nicotine products are regulated by the Act (2022:1257) on Tobacco Free Nicotine Products. It aims to limit the health risks associated with tobacco-free nicotine products. It contains regulations on product notification, product requirements, sales, and marketing of tobacco-free nicotine products. Some parts of the regulation entered into force in August 2022, but new measures are yet to be fully implemented. The responsibility for compliance with the provisions lies with the manufacturer, importer, and seller of tobacco-free nicotine products. The mission of the PHAS is to support the work with knowledge, guidance, and regulations and provide manufacturers and importers with relevant information. The marketing and advertising of tobacco-free nicotine products have been limited and regulated since August 2022. Advertising or other marketing cannot be intrusive, soliciting or encouraging the use of nicotine products. Moreover, the product's taste can only be referenced if the consumer needs product information. Marketing cannot be directed specifically to children or young people under 25. The products cannot be sold to people under the age of 18. The packaging of tobacco-free nicotine products cannot state that it is less harmful than similar products nor resemble a food or a cosmetic product.

From January 1st, 2023, the harmful effects of nicotine have to be communicated on the package (SFS, 2022:1257) in the form of a health warning and declaration of content. Despite these changes, regulations around health warnings, content declarations, and more are under development; the regulations about how the health warning and the declaration should be designed and placed on tobacco-free nicotine products such as NP and the assignments of the PHAS are said to be finalized and published in 2023 and 2024.

APPENDIX 1.2. Content of Nicotine Pouches.

The material of NP comprises viscose fibers bound together by heat, chemical, or solvent treatment. The non-tobacco substrate consists of water and microcrystalline cellulose, creating 80-90% of the product. It also contains salt, taste additives, sweeteners, and pharmaceutical-grade nicotine. Visually, they are typically white and sold in plastic containers, not brown, as the traditional snus. (McEwan et al., 2021). NP are smokeless and often flavored. NP contains nicotine, which is an addictive substance in snus. Even though nicotine is mainly produced from tobacco, NP is often communicated as tobacco-free (Centralförbundet för alkohol- och narkotikaupplysning, 2022).

APPENDIX 1.3. Risks with nicotine.

NP may be less harmful than combusted or inhaled products like cigarettes. However, this does not mean NP is risk-free or harm-free (Schneller, Felicione, Hammond, Goniewicz, & O'Connor, 2023). The nicotine in NP is produced from tobacco, and its serious health risks are common to all nicotine and tobacco products. Nicotine is considered one of the most addictive substances, and according to the US surgeon general (2010), nicotine is as addictive as cocaine or heroin. Several human and animal studies have shown that nicotine increases the risk of cardiovascular, respiratory, and gastrointestinal disorders (Mishra et al., 2015). Nicotine used during pregnancy can cause complications for the woman, the fetus,

and even the newborn baby (Folkhälsomyndigheten, 2022). Nicotine can be dangerous for adolescents and young adult brain development, which continues into their early to mid-20s (US Department of Health and Human Services, Centers for Disease Control and Prevention, 2016).

Some research has addressed the question of whether the age at which one begins using snus has an impact on the likelihood of smoking later in life. A study made by “Statens beredning för medicinsk och social utvärdering” (SBU) in 2020 shows that people who use snus (tobacco-snus) or e-cigarettes start smoking tobacco products more frequently over time than people who do not use snus or e-cigarettes (SBU, 2020). Another study from 2023 shows that users of oral nicotine products such as NP are more likely to use other nicotine products. Additionally, those who do not usually use nicotine products might be more prone to start because of the availability of flavors and the easily concealable design that may be attractive (Schneller, Felicione, Hammond, Goniewicz, & O’Connor, 2023). Overall, NP has nicotine which is a highly addictive substance, and many of today’s youth who are using tobacco-free nicotine products could become cigarette smokers in the future.

Some view NP as a much healthier replacement for cigarettes. Swedish Match communicates that they “provide a wide range of attractive alternatives to cigarettes that are both enjoyable and dramatically safer than smoking” on their website. A study by (McEwan et al., 2021) demonstrates that “NPs can provide nicotine in amounts sufficient to replicate cigarette smokers’ nicotine uptake following a switch from conventional cigarettes to these potentially less harmful NP products.” At the same time, there is an essential difference between actual Nicotine replacement therapy (NRT) and tobacco industry products such as NP for smoking cessation. NRT is a medicine that provides a low level of nicotine, and its purpose is to make it easier for tobacco users to quit smoking and not create a new addiction. NRT is available as skin patches, chewing gum, inhalators, tablets, and nasal and mouth spray (NHS, 2022). So far, there is no evidence that they work for quitting snus, and they are far healthier than using NP as a means for cessation. (1177.se, 2022).

APPENDICES 2

APPENDIX 2.1. Variables.

Perceived appeal: Translated to English, the alternatives would be: ‘Not at all’, ‘To some small extent,’ ‘To some extent,’ ‘Neither much nor little,’ ‘To a fairly high degree,’ and ‘To a very high degree,’ ‘To an extremely high degree.’

Perceived Likelihood of Cessation: To answer the question the following alternatives were given: are “0-5”, “6-10”, “11-15”, “16-20”, “21-25”, “26-30”, “30-39,” and “More than 40”. We decided to replace the symbol “>” by using the word “more” to minimize confusion for the participant. Once again, in frequencies as it seemed reasonable to include a question with frequencies as answer alternatives in our survey (Gigerenzer, 1995).

Perceived branding: First, we asked: “According to you, which age groups is the product targeting?” with answer alternatives: “18 and younger”, “18-25”, “26-35”, “35-45”, and “45 and older”. We changed the original scale from “younger than me,” “my age,” and “older than me” to the age range to make it more clear which age groups NP are perceived to be targeted at. Secondly, we asked participants if they thought this product was more likely to be directed to men or women.

Individualist-Collectivist: A shorter version of Kahan’s (2008) “Cultural Cognition Scale” was used containing the six following statements: (1) “The government is intervening too much in our everyday life,” (2) “The government needs to enact laws that prevent people from hurting themselves,” (3) “It is

not the government's role to save people from themselves,” (4) “The government should stop telling people how to live their lives,” (5) “The government should do more for the public good, even if it means limiting individuals' freedom and choice” and (6) “The government should limit individual choices to avoid these getting in the way of the good of society.” The 7-point Likert scale was used ranging from “Absolutely incorrect” (1) to “Absolutely correct” (7). Responses closer to 1 represent an individualistic view, and 7 represent a collectivistic one. Questions (1), (3), and (4) were reversed.

Perceived harm: We excluded statements referring to taste and flavors or price since these were irrelevant to our thesis. The statements kept were the following five: “Compared to tobacco snus, would you say that tobacco-free nicotine pouches: (1) are less harmful to a person's health, (2) are less harmful to a person's heart, (3) are less harmful to a person's mouth or gums, (4) are less likely to stain your teeth, (5) are less addictive. The original 9-point Likert scale was changed to a 7-point Likert scale going from “Absolutely not correct” (1) to “Absolutely correct” (7).

Perceived risk: The risk (Sjöberg, 1999) was measured using assessments on a 6-point scale from “Very high risk” (1) to “No risk at all” (6). We started off the question by defining “Nicotine user” by indicating that “a nicotine user is a person that used tobacco-free nicotine snus (white snus)”. These were the following three statements: (1) “Nicotine users suffer from negative health consequences.”, (2) “People around the nicotine user suffer from negative health consequences.”, (3) “People, in general, are affected by negative health consequences when others use nicotine snus.” “People around the nicotine user suffer from negative health consequences.”, (3)

Perceived message effectiveness: Measured using the UNC PME Scale (Baig et al., 2019), cited in a study to investigate the effects of message framing in health warnings and plain packaging on non-smokers (Gantiva, 2022).

APPENDIX 2.2. Design of warning messages.

The Public Health Agency of Sweden has published detailed information about the design of warning messages for tobacco products. New laws about the design of warnings for NP will come forward in spring 2023 in Sweden, so when we designed the messages we followed the template for tobacco-snus.

Each unit package of tobacco snus and any outer package of tobacco snus should have the following warning message translated to English: “This tobacco product is harmful to health and is addictive.” The health warning on tobacco snus must appear on the two most extensive surfaces of the package and shall cover 30 % of the surface. The dimension shall be calculated in relation to the surface concerned when the package is closed. The design of the health warnings for snus should have the: Font: Helvetica; Font size: use a font size such that the text covers the largest part of the area reserved for the health warning; Font color: Black; Style: Bold; Alignment: Centered; Background color: White; Frame: Width 1 mm. The frame should be placed inside the surface reserved for the health warning. (Folkhälsomyndigheten, 2016). Additionally, although there is no information about the design of warning messages on NP packages in Sweden, NP packaging should have the following warning message: “This product contains nicotine which is a highly addictive substance.”

To calculate the 65 000 SEK in 5 years we assumed the individual is consuming 5 NP packs per week (Snusbolaget, 2018) each year for 5 years at a price of 50 SEK.

APPENDIX 2.3. Multiple-items' internal consistency measures in each group.

Variable	Control α	Non-Pain gain α	Non-plain loss α	Plain gain α	Plain loss α
Perceived Harm	0.76	0.81	0.61	0.60	0.74
Perceived Risk	0.71	0.40	0.72	0.40	0.82
Perceived message effectiveness	0.94	0.89	0.87	0.93	0.88
Intentions	0.60	0.66	0.60	0.50	0.60
Collectivist/Individualistic	0.79	0.71	0.79	0.75	0.79

APPENDICES 3

APPENDIX 3.1. Overview of the descriptive statistics regarding gender, age, occupation, and familiarity for the entire sample. (n=251)

Variables	N 251	n	Percentage = 100%
GENDER			
Female		143	57.00
Male		108	43.00
AGES (M = 23.82)			
18-24		172	68.53
25-29		53	21.12
30-35		26	10.36
OCCUPATION			
Full-time employed		58	23.11
Part-time employed		11	4.38
Unemployed		2	0.80
Sick Leave		0	0.00
Student		180	71.71
FAMILIARITY			
Very familiar with Nicotine pouches		61	24.30
Female (%)		32	52.46
Male (%)		29	47.54
Familiar with Nicotine pouches		129	51.39
Female (%)		61	47.54
Male (%)		68	52.46
Not familiar with Nicotine pouches		61	24.30
Female (%)		39	63.57
Male (%)		22	36.43

APPENDIX 3.2. Differences in attitudes towards snus across ages using boxplots.

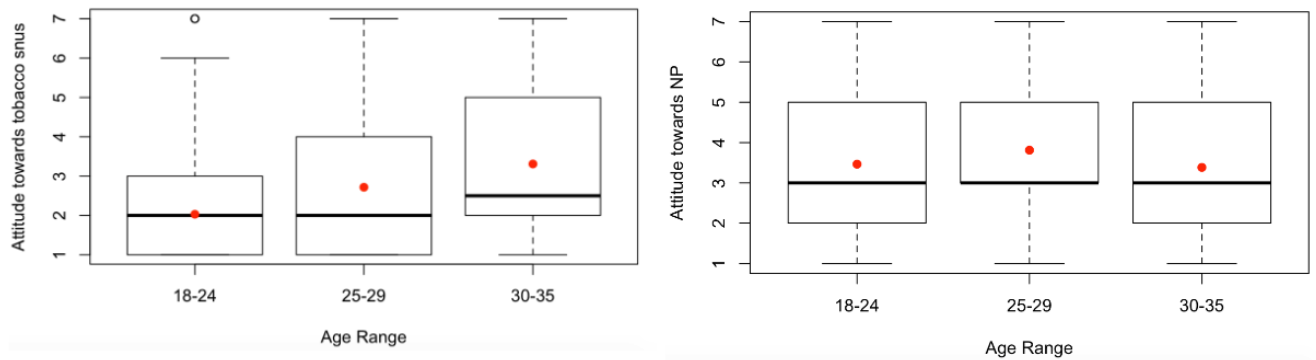


Figure 5: The boxplots plot the attitude towards tobacco snus and the attitude towards NP (Nicotine pouches) across the three age ranges. The x-axis shows the age ranges and the y-axis the respective attitude. The red dots represent the means. The line inside the box represents the median, and the whiskers extend from the box to the minimum and maximum values. The data points outside the whiskers are outliers.

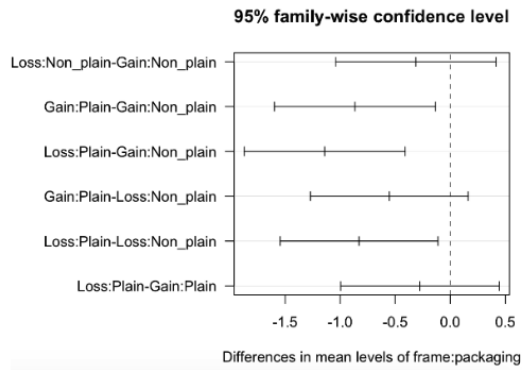
APPENDIX 3.3. Means and standard deviations of the attitudes towards tobacco snus and NP.

Variable	Attitude towards tobacco snus		Attitude towards NP	
	M	SD	M	SD
GENDER				
Female	1.82	1.25	3.33	1.69
Male	2.94	1.83	3.80	1.81
AGES				
18-24	2.03	1.41	3.46	1.76
25-29	2.72	1.75	3.81	1.73
30-35	3.31	2.09	3.38	1.75
FAMILIARITY				
Very familiar with Nicotine pouches	3.21	1.76	4.77	1.66
Familiar with Nicotine pouches	2.13	1.62	3.40	1.68
Not familiar with Nicotine pouches	1.77	1.04	2.56	1.22

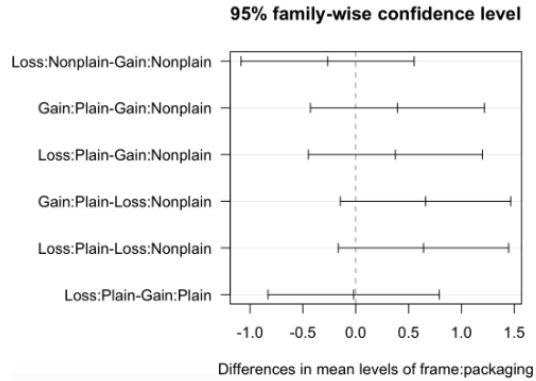
Note: The variable attitude was measured by using a 7-point Likert scale: (1) Very bad, (7) Very good.

APPENDIX 3.4. Tukey's HSD plots for each dependent variable.

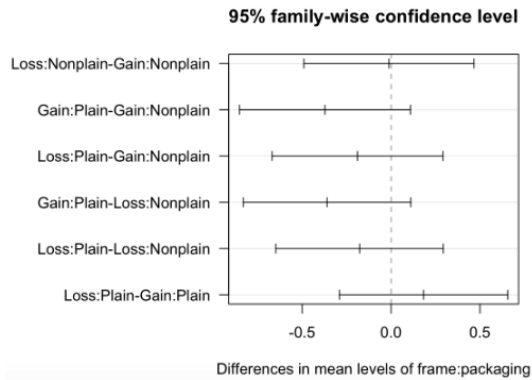
Panel A: Perceived Appeal



Panel B: Perceived likelihood of NP cessation



Panel C: Intentions



Panel D: Perceived message effectiveness

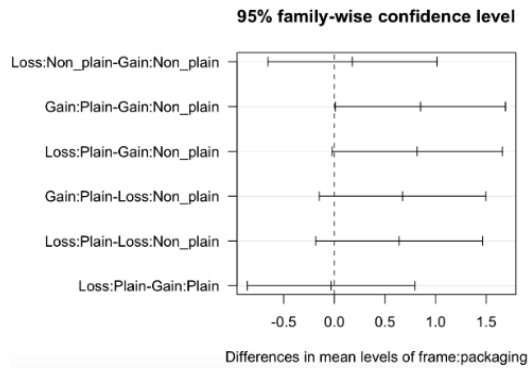


Figure 6: The above Tukey's HSD tests plots if means between the different packaging and message frame groups differ significantly in terms of Perceived Appeal, Perceived likelihood of NP cessation, Intentions, and Perceived Message Effectiveness. The values on each y-axis display which packaging/frame groups have been compared to one another. Values on each x-axis indicate the differences in mean between the compared group. Means are considered significantly different when the 95% confidence interval does not cross the 0-point of difference in means.

APPENDIX 3.5. Mean and standard deviations for the variable Perceived Harm.

Compared to smokeless tobacco, nicotine pouches:	M	SD
Are less harmful to a person's health	4.57	1.47
Are less harmful to a person's heart	3.76	1.36
Are less harmful to a person's mouth or gums	3.57	1.58
Are less likely to stain your teeth	5.41	1.45
Are less addictive	2.11	1.35

Note: (1) Absolutely incorrect to (7) Absolutely correct

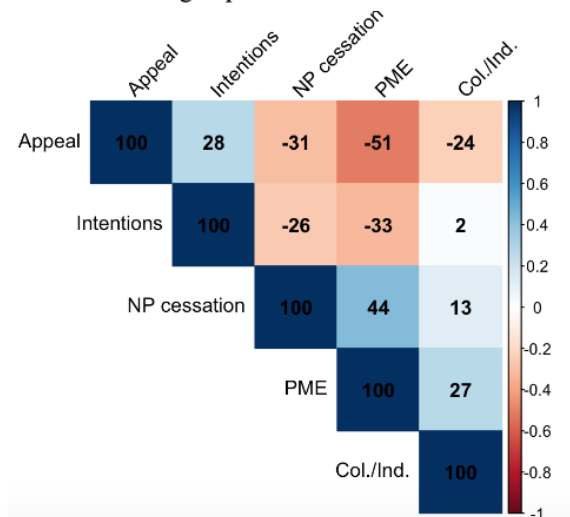
APPENDIX 3.6. Means for the multi item variable Perceived Risk.

Variable	General M	Women M	Men M
Risk to user	2.77	2.73	2.82
Risk to surrounding	4.74	4.78	4.68
Risk to others	4.72	4.64	4.81

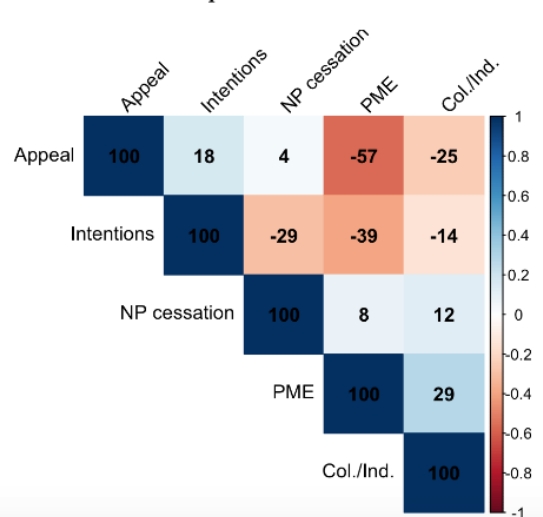
Note: The variable Perceived risk was measured using: (1) Very big risk, (6) No risk at all

APPENDIX 3.7. Correlation matrix for all dependent variables in each group.

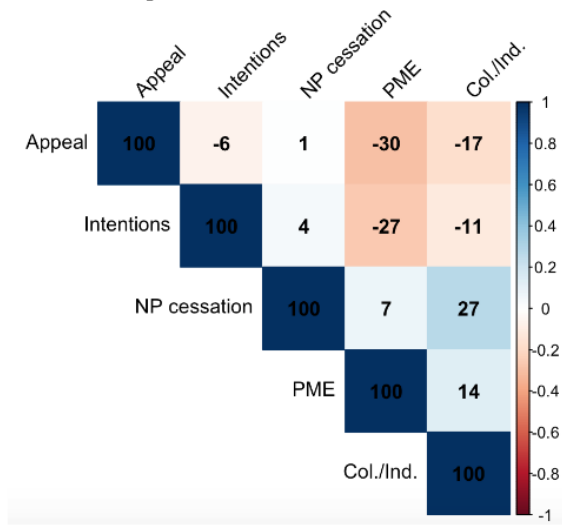
Panel A. Control group



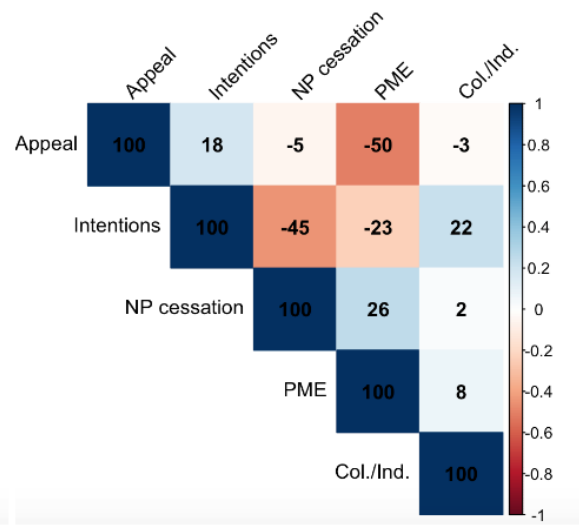
Panel B. Non-plain Gain



Panel C. Non-plain Loss



Panel D. Plain Gain



Panel E. Plain Loss

