Electronic Cigarettes: Market Entry in Iceland?

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Abstract

Given that e-cigarettes will reach the required research and manufacturing standard, Artasan, an over-the-counter pharmaceutical company, are evaluating their potential distribution on the Icelandic market. Smoking consumption among Icelanders is of decreasing concern as daily cigarette use has reduced from 33% to only 11.6% in the last 26 years. However, sales of nicotine replacement therapies have evidently been increasing alongside the decreasing use of cigarettes. Globally, e-cigarette interest is growing rapidly although countries differ in regards to their regulation. In addition, e-cigarettes are highly controversial as they have been perceived as potential harm reduction tools for experienced smokers yet also as an immensely concerning item that may lead to the renormalization of smoking. More concerning is that e-cigarettes are promoted with features appealing to youth or non-smokers.

An e-cigarette marketing experiment was conducted based on e-cigarettes attributes (relative advantage vs. compatibility) of innovation. A sample of 592 smokers and 224 former smokers participated. Smokers viewed an online advertisement promoting e-cigarettes in which one of three comparison types (two innovation attributes compared to a third control group) were emphasized. Smokers then indicated their interest in trying e-cigarettes and their perceived advantage over NRTs. Demographic variables such as gender and age were also included in the analysis. Results demonstrated the first evidence of e-cigarette use in Iceland where e-cigarettes seem to be more prevalent among either current or former smokers than five out of six nicotine replacement therapies available in Iceland. Further findings indicated no difference between attributes of innovation in regards to smokers' interest in trying e-cigarettes. However, female smokers were found to be more interested in trying e-cigarettes compared to males. Interest in trying e-cigarettes was also higher among younger participants than older ones. Finally, the perceived advantage of e-cigarettes compared to NRTs was higher among smokers who have tried e-cigarettes compared to smokers who have not. The author recommends that Artasan should distribute e-cigarettes in Iceland, given they reach the required standards for a marketing authorization. However, they should follow a certain set of guidelines such as concerning flavors and warning messages to prevent their appeal to youth and non-smokers.

Key Words: E-cigarettes, external environment, innovation attributes, marketing, market strategy.

Declaration of Research Work Integrity

Submitted in partial fulfillment of the requirements of the MSc International Business & Marketing degree from Reykjavík University.

By signing the present document, I confirm and agree that I have read RU's ethics code of conduct and fully understand the consequences of violating these rules in regards to my thesis. I, Hinrik Hinriksson, is the original author of the current thesis, which has not been submitted for similar purpose in another educational program before. This thesis is the result of my own investigations, except were otherwise is stated. Other sources are acknowledged with the relevant references.

May 15, 2015, Reykjavík, Iceland

ID Number: 060690 - 3089

Hinrik Hinriksson

Date Signature

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Preface

This thesis was done in collaboration with Artasan and Gallup under the guidance of Dr. Gerhard Apfelthaler. Artasan (a sales and marketing company for over-the-counter pharmaceuticals) looks to gain on possible outcomes and implications of the thesis.

Artasan is currently contemplating initiating importation and sale of e-cigarettes in the Icelandic market, given that research development and regulations will serve in their strategic advantage. The thesis aims to combine both theory and practice elements to enlighten Artasan and other Icelandic organizations about the controversial topic of substituting conventional cigarettes for e-cigarettes. In general, outcomes should not only give ideas to the feasibility/sensibility of importing e-cigarettes into the Icelandic market. It will also serve as a valuable information sheet for both tobacco/alcohol related companies as well as organizations involved in tobacco prevention. As noted, today it is not yet possible to import e-cigarettes with all its accessories to Iceland due to the underdeveloped research status of the product. Therefore, this thesis will have limited validity until current conditions will change in favor of e-cigarettes.

E-cigarettes have a short empirical history as it is a relatively modern product. However, due to it being a highly controversial item, they have been studied and written about extensively. In the current thesis, already existing data found in relevant books, peer reviewed studies or articles will be exploited in the attempt to give the best possible answers to the research questions. Moreover, this thesis intends to give up-to-date leads on the potential e-cigarette sale in Iceland in regards to the external environment. Potential competitive forces will also be addressed. A special emphasis is put on e-cigarette marketing, which currently is one of the main causes for concern. To improve on the already existing data, a marketing experiment was conducted in which the potential promotion (marketing) of e-cigarettes was examined within the Icelandic market. The marketing experiment was conducted with the purpose of gaining new information on the preferences of experienced smokers. The new information will hopefully give leads to how e-cigarettes could be promoted in Iceland, if they were to enter the market.

To the authors' best knowledge, this is the first thesis on a university level in Iceland that covers a topic related to e-cigarettes.

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1. Introduction

"Giving up smoking is easy. I've done it hundreds of times."

These are the words of Mark Twain, a well-known US American writer and humorist when making fun about cigarettes and the grip they have on consumers through nicotine addiction (Boller & George, 1989). Largely due to this nicotine grip, the use of tobacco cigarettes has become a world known concern accompanied with serious health risks such as cardiovascular diseases, strokes and cancer. The most common tobacco product, the conventional cigarette, contains over 7000 chemicals with 250 of them proven to be harmful, of which 69 are cancer causing (Hanson, Venturelli, & Fleckenstein, 2014). Since smoking habits have been known to be damaging to health as well as addictive, manufacturers have striven to invent successful smoking cessation aids. With highly addictive substances such as nicotine placed in the cigarette, the ultimate smoking cessation among users tends to be difficult and complex (Rippe, 2013). With the aim of smoking cessation, numerous aid equipment have been introduced to the global market, such as nicotine patches, chewing gum and inhalers which have proven to serve their purpose (Johnson, 2010). However, the world market keeps developing, introducing innovations such as e-cigarettes which effectively, yet worryingly have challenged the market of nicotine replacement therapies.

In this first chapter, the subject of electronic cigarettes (e-cigarettes) is systematically introduced with relevance to the subject of the current thesis and related elements. Following a short introduction about Artasan, the increase in Icelandic tobacco use is documented and Iceland's successful efforts of scaling back cigarette prevalence since they were found to have adverse health effects. After cigarettes and nicotine have been covered, nicotine replacement therapies (NRTs) are discussed, which recently have faced competition from the new electronic nicotine delivery systems (ENDS). The market growth of e-cigarettes and their various regulations across countries are finally addressed in end of this chapter.

1.1. Artasan

Artasan is a sale- and marketing company mainly focusing on generic and over-the-counter pharmaceuticals in collaboration with foreign suppliers. Together with its associate companies, Artasan sells and distributes its products to pharmacies and retail stores. Among their main products are the Nicotinell nicotine replacement therapies such as chewing gum, patches and bupropion. Under the parent company Veritas Capital,

Artasan alongside Distica, Vistor and MEDOR form a group of leading providers of supplies and services to the healthcare sector in Iceland (Artasan, 2015; Veritas Capital, 2015). Always on the alert for growth opportunities and aware of recent e-cigarette developments in the world market, Artasan has enquired for further examination on the subject.

1.2. Development of Tobacco use in Iceland

Tobacco use in Iceland can be traced back to the 17th century where foreign sailors reached the shores from Europe. Since then, Icelanders have been known to use both chewing tobacco and so-called "snuff"[1]. Around the year 1900, cigarettes finally became popular among Icelanders. For instance, approximately half of Icelandic men smoked cigarettes after the Second World War (Þóra Helgadóttir, 2003). Back then, people considered cigarette use to be elegant and respectable and cigarettes were promoted as such. Little was known about the health risks that accompanied them and cigarette advertisements commonly included children and doctors with the purpose of showing how innocent and respectful they were. Moreover, Icelandic people smoked cigarettes wherever they wanted, such as banks, health institutions and airplanes (Magnússon, 2012).

It was not until about the year 1950 that Icelanders started to realize how harmful cigarettes really were. Influential studies were conducted by Niels Dungal, a professor of medicine and chairman of the Icelandic Cancer Society. He found a relation between cigarettes and lung cancer, which was in fact one of the first studies displaying evidence of the severe health risks that accompany smoking. These results were published both in foreign and local medicine periodicals and served as an awakening for the Icelandic society. The cancer society launched educational activity and preventive measures which was especially focused on schools. In 1960, every other boy between the ages of 12 and 16 smoked. In 1969, the Icelandic parliament finally interfered and passed laws that labeled cigarette packs with warning messages. Three years later, in 1972, tobacco commercials were prohibited (Magnússon, 2012). Further laws on anti-tobacco measures were passed in 1984 with the goal of minimizing health damage and casualties resulting from tobacco use. In addition to laws, educational material became more and more evident in media and schools with smoke-free areas growing in numbers (Althingi, 1984). The latest laws passed against smoking was in 2007 when smoking became illegal in

[1] A smokeless tobacco meant for intraoral application (Burket, Greenberg, Glick, & Ship, 2008).

enclosed public spaces such as cafes, bars, clubs and restaurants (Planet, Parnell, & Presser, 2010).

Iceland has enjoyed great success concerning anti-tobacco measures as cigarette use has steadily decreased in the last 25 years. Cigarette use in Iceland is now amongst the lowest when compared to other European countries. For instance, Iceland has by far the highest spending on tobacco control per capita in Europe. Despite the unfavorable currency rate against the euro, the law obliges the government to spend at least 0.9% of tobacco revenues on tobacco control (Joossens & Raw, 2014). However, tobacco use still remains the nation's primary preventable cause of premature death (Magnússon, 2012). Annual surveys have been conducted on the smoking habits of Icelanders between 15-89 years of age. From 2004, these surveys have been under the supervision of Capacent (today referred to as Gallup), which is Iceland's leading knowledge company. According to the latest report from Gallup, published in 2014 for the year 2013, only 11.6% of Icelanders reported to smoke on a daily basis. As displayed in Figure 1, this is a dramatic decrease in smoking habits since 1987 when the rate of daily smokers in the population was at 33%. During the same period, the rate of people who reported to never have smoked, increased from 37.8% in the year 1987 to 47.3% in 2013 (Director General of Public Health, 2014).

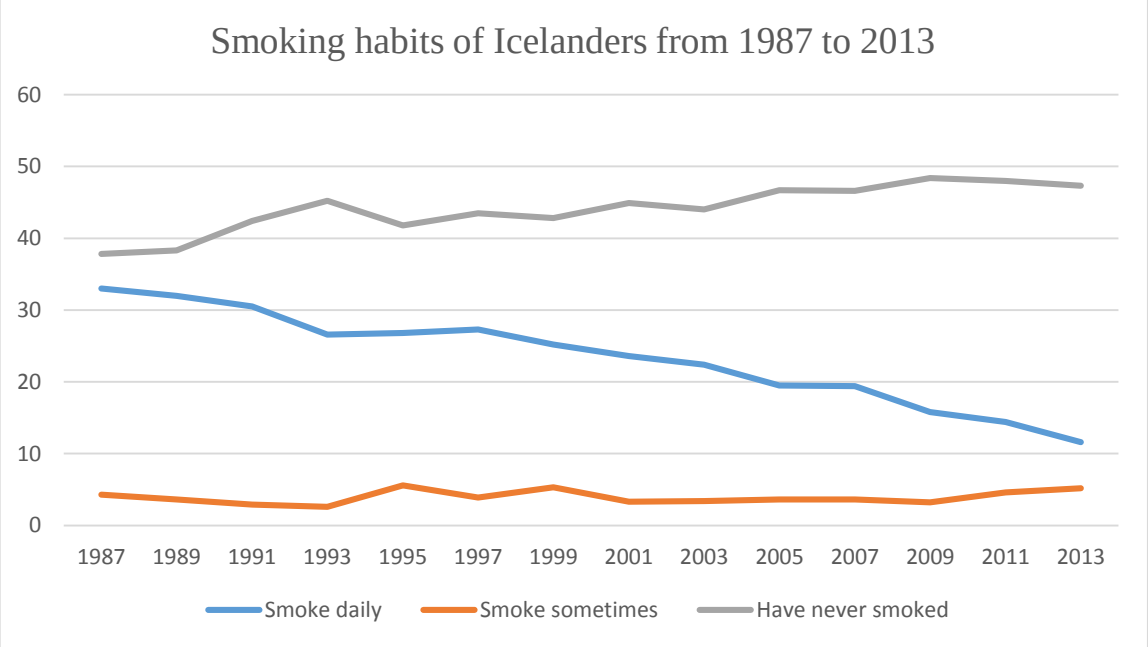

Figure 1. The Smoking habits of Icelanders in the period from 1987 to 2013

When considering the decrease of smokers compared to Iceland's population numbers, the success becomes equally as prominent. In 1987, a total of 80,572 people

accounted for 33% of the population whereas 37,335 people made 11.6% of the population in 2013. Therefore, less than half as many people smoked daily in 2013 than in 1987 (Hagstofa Íslands, 2015).

Notably, and contrary to the positive development of cigarette use, is the increased use of moist snuff among Icelanders. In recent years the use of moist snuff has easily surpassed the use of cigarettes perhaps causing Icelandic health organizations to shift their focus from cigarettes to moist snuff, especially as moist snuff is mostly used by young individuals. For instance, 20% of individuals at the age of 18-19 years reported using moist snuff daily (The Directorate of Health, 2013). Similar to the case of e-cigarettes (further described below), health studies have struggled to determine whether carcinogenic substances are present in the moist snuff (Pressan, 2015; Vísir, 2013), which may explain its rise in popularity compared to the conventional cigarette. In the next sub-chapter, conventional cigarettes are further analyzed.

1.3. Cigarettes and Nicotine

Cigarettes are the largest preventable cause of cancer and death worldwide (World Health Organization, 2015a). Within the cigarette smoke, either inhaled or exhaled by the user, numerous hazardous substances are released, which are the primary cause of the documented detrimental health effects. From the over 7000 substances, and the 250 harmful ones, presumably the most known are tar, carbon monoxide and nicotine. Other notable substances include hydrogen cyanide, arsenic, ammonia and benzene (Hanson et al., 2014). The tar contains a large amount of carcinogenic chemical compounds. Approximately 70% of those compounds adheres to users' lungs with the inhalation of cigarette smoke. In the process, the tar causes harm to the lungs and cilia whose purpose is to protect the lungs to toxins and infections (Haworth & Forshaw, 2002). Consequently, the most common cancer traced to cigarette smoking is lung cancer which also accounts for the most cancer deaths by far in the world (World Health Organization, 2015a). Cigarette smoke also contains the odorless and tasteless yet toxic gas substance, Carbon monoxide. The carbon monoxide, which generally does not make its presence known, blocks the flow of oxygen in the blood as it binds to the red blood cells. To compensate for low oxygen levels, an increase of red blood cells in the body occurs resulting in greater blood viscosity. For an individual's blood viscosity to become greater has been known to cause thrombosis or other severe blood diseases (Almarshad & Hassan, 2014). These harmful substances included in the cigarette smoke are by no means solely harmful to the

user himself as they also pass to every person present to the smoker (referred to as indirect smoking). Individuals who come up against a great deal of indirect smoking run the risk of receiving similar diseases as the smoker himself. However, they are less likely to become addicted (Hirayama, 2000).

One cigarette typically contains about 10-15 mg of nicotine from which less than 1 mg transmits to the user's bloodstream and lungs. Although being one of the most habit-forming substances available, nicotine is not one the many substances in cigarettes that leads to cancer (Jóhannesson, 2001). However, this small amount of nicotine affects the central and peripheral nervous system. In only a few seconds, the nicotine reaches from the bloodstream to the brain where it stimulates the receptors of the midbrain which is connected to both the frontal lobe and the limbic system (Tweed, Hsia, Lutfy, & Friedman, 2012). Due to the stimulation, the body induces the release of several neurotransmitters, including dopamine into the rewards circuits of the brain. The release of dopamine is responsible for a sense of well-being and relaxation for the user (Benowitz, 2010). As this state of well-being generally does not last for a long time, the user strives to repeat the behavior over and over again. A long-term use of products containing nicotine such as cigarettes, causes the dopamine receptors in the brain to grow in numbers. Consequently, the user's tolerance level against the nicotine increases leading to an increased use of the nicotine product (Ries, Miller, & Fiellin, 2009). Logically, long term smokers of tobacco generally find it difficult to dispose themselves from the nicotine addiction. Therefore, to aim for smoking cessation, nicotine replacement therapies were presented.

1.4. Nicotine Replacement Therapies

A significant factor contributing to the successful development of cigarette use in recent years is the introduction of nicotine replacement therapies (NRTs). After cigarette use became a worldwide health issue, NRTs were the first pharmacologic treatments to be offered for smoking cessation. Since then, studies have shown that the quit rate among smokers who take a nicotine replacement therapy is double that of smokers who do not (Johnson, 2010).

On the Icelandic market, a wide range of NRTs are currently available with the purpose of reducing risk associated with smoking. NRTs with a marketing authorization in Iceland are in forms of a nasal spray, patches, inhalers, mouth spray, lozenges, bupropion or chewing gums (IMA Pharmacopeia, 2015). Since the Icelandic Medicine

Agency started to record the sales of NRTs on the Icelandic market, sales have gradually increased whilst cigarette use gradually decreased such as described in the previous section. Figure 2 illustrates how the sales of NRTs in Iceland have steadily increased during the same period of time displayed in Figure 1 above where cigarette use was shown to be decreasing. The consumption of medicines/drugs such as NRTs is generally measured with the average maintenance dose per day among a given amount of individuals for its main indication (Gould & Meer, 2006). In 1989, the defined daily doses of NRTs were under five per 1000 inhabitants a day (DDD/1000/day). In the next 10 years the doses raised to over 10 and in 2013 they were over 20 a day per 1000 inhabitants (Icelandic Medicines Agency, 2014d).

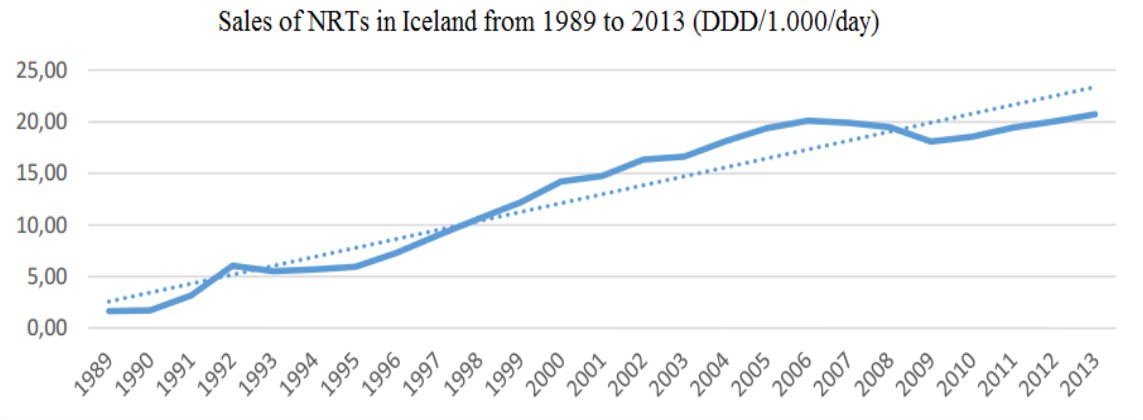

Figure 2. Sales of NRTs in Iceland from 1989 to 2013

In addition to the increased use of NRTs in Iceland, the current use seems to be relatively high. Compared to other Scandinavian countries, such as Denmark and Norway, the use of NRTs is much more prevalent among Icelandic inhabitants. Figure 3 displays the sales of NRTs in Iceland in comparison to Denmark and Norway. Although the defined daily dose is gradually increasing per 1000 inhabitants in all three countries, Iceland seems to present by far the most use of NRTs in recent years (Icelandic Medicines Agency, 2014d). This difference may result from the much lower cigarette use prevailing in Iceland especially compared to Denmark where around 30% of the population were reported to be daily smokers of cigarettes (Clemmensen, Lynge, & Clemmensen, 2012). In Norway, daily use of cigarettes was recorded at 19% in the year 2010 and at 15% in 2015 (World Health Organization, 2015c). Notably, Norway also had the highest cigarette prices in the world in 2013 (Joossens & Raw, 2014). It should be noted that increased

price is one of the leading cause for smoking cessation (Nguyen, Rosenqvist, & Pekurinen, 2012).

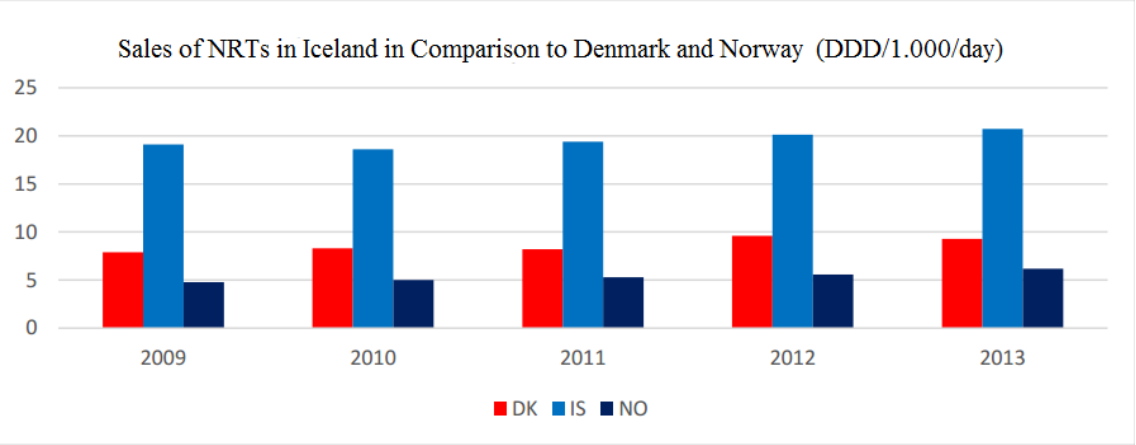

Figure 3. Sales of NRTs in Iceland in comparison to Denmark and Norway

Considering the increasing use of NRTs in Iceland and its high prevalence compared to neighboring countries, there should be an opportunity for other more advanced products to compete, such as e-cigarettes.

1.5. Electronic Cigarettes

Electronic cigarettes (e-cigarettes) are electronic nicotine delivery system (ENDS) devices invented in their current form by the Chinese pharmacist Hon Lik in 2001 and patented in 2003. This technology is different from its predecessors as it addresses both pharmacologic and behavioural components of cigarette addiction (Cahn & Siegel, 2011). The devices are powered by battery and vaporize a nicotine liquid solution (also known as: aerosol, e-liquid or e-juice) commonly containing chemicals such as propylene glycol and glycerol (R. Grana, Benowitz, & Glantz, 2014). E-cigarette manufacturers have proclaimed that tar or other toxic chemicals found in conventional cigarettes are not evident in the vapor that an e-cigarette user either inhales or exhales (Wollscheid & Kremzner, 2009). The initial e-cigarette model was in the shape of a regular cigarette. It was either a plastic or a metal device comprising three parts: a nicotine reservoir for solution, a heating element (i.e. atomizer) that converts the liquid into a vapor, and the battery itself. Since then, the quality of performance and product functioning has been inconsistent and varied greatly. With the product design and contents changing rapidly it has become more difficult to generalize what an e-cigarette is and what it presents to a user and the environment (R. Grana, Benowitz, & Glantz, 2013). Differing from conventional cigarettes or modern nicotine replacement therapies such as patches, gum and lozenges, e-cigarettes are not necessarily pre-filled or pre-assembled. Even the

medical nicotine inhaler, which resembles e-cigarettes the most, is standardized for instant use (R. Grana et al., 2013).

Modern e-cigarettes can be categorized into four different groups considering their design and engineering. Figure 4, illustrates the four types of modern e-cigarettes and how they differ.

Product Type	Description
Disposable E-Cigarette 	Cigarette-shaped device consisting of a battery and a cartridge containing an atomizer to heat a solution (with or without nicotine). Not rechargeable or refillable and is intended to be discarded after product stops producing aerosol.
Rechargeable E-Cigarette 	Cigarette-shaped device consisting of a battery that connects to an atomizer used to heat a solution typically containing nicotine. Often contains an element that regulates puff duration and/or how many puffs may be drawn consecutively.
Pen-Style, medium-sized rechargeable e-cigarette 	Larger than a cigarette, often with a higher capacity battery, may contain a prefilled cartridge or a refillable cartridge (often referred to as "clearomizer"). These devices often come with a manual switch to regulate length and frequency of puffs.
Tank-Style, large-sized rechargeable e-cigarette 	Much larger than a cigarette with a higher capacity battery and typically contains a large, refillable cartridge. Often contains manual switches and a battery casing for customizing battery capacity. Can be easily modified.

Figure 4. Examples of different e-cigarette products. Reproduced from R. Grana, Benowitz, & Glantz, (2013) p. 14.

In addition to the four categories described above, a new element has been added to some modern e-cigarettes. These are referred to as variable voltage e-cigarettes and allow users to manipulate the level of voltage that activates the atomizer. With this option,

a user is able to increase the vapor production and nicotine delivery (Kosmider et al., 2014).

E-cigarettes have not only been offered with different functions and designs as manufacturers offer them in a variety of flavors as well. A total of 7764 different flavors were found among 466 e-cigarette brands in an online market study in 2014. Most brands offer e-cigarettes with a tobacco flavor (93.4%) while 92.1% offer menthol. Other popular flavors among e-cigarette brands are fruit (84.2%), desserts/candy (79.9%), and alcohol (77.5%) (Zhu et al., 2014).

According to a media research from Vinik (2014), e-cigarettes are generally less expensive than conventional cigarettes. However, due to the initial investment of a starter kit, consisting of a rechargeable e-cigarette with all accessories, the use of e-cigarettes first starts to pay off after about 50 days of use. This is assuming an average smoker, smokes 12 median priced Marlboro red cigarettes (each delivering 2 mg of nicotine to the user) a day and the e-cigarette starter kit costs USD $70 while a 30 ml cartridge costs about $18. In that case a typical smoker consumes 1 mg of nicotine for 15.7 US cents whereas the e-cigarette user pays 10 cents. This price difference between the use of e-cigarettes and conventional cigarettes is one of several factors presumably contributing to a growing e-cigarette market.

1.6. The E-cigarette Market

According to a recent survey conducted by the World Health Organization, the availability of e-cigarettes is widespread. Over half of the world's population live in countries where e-cigarettes are available, whereas only 4% live in countries where no records of e-cigarette availability exist (the remaining countries did not respond concerning the availability of e-cigarettes) (World Health Organization, 2014).

The e-cigarette market is estimated to be worth $136 million a year. In the year 2013, it increased by 340% to reach $287 million where global consumers spent $3 billion on 466 separate brands. In 2015, the market worth is expected to grow up to around $500 million (Halperin, Atwater, Fradkin, & Medeiros, 2015; Britton & Bogdanovica, 2014). At a global level there are many countries where data do not exist on the use of e-cigarettes. However, data primarily from the European Union and North America indicate that from 2008 to 2012, e-cigarette use at least doubled among adults and adolescents. In the EU, 7% of the population aged 15 years and over, reported to have tried e-cigarettes in 2012 with 1% using them regularly. In the USA, 47% of smokers and ex-smokers

reported to have tried e-cigarettes whereas 4% of that group were regular users in 2013 (World Health Organization, 2014). In the United Kingdom, it is estimated that over 2% of the population use e-cigarettes which corresponds to 1.3 million users (Britton & Bogdanovica, 2014).

Ever since e-cigarettes were an established product, consumers have taken an increasing interest in them. Initial marketing studies found evidence suggesting that internet searches for e-cigarettes increased by over 5000% between 2008 and 2010 (Yamin, Bitton, & Bates, 2010). Since then, interest has been increasing even further with e-cigarettes heavy marketing through both traditional (e.g. television and print) and digital outlets. Celebrity endorsement, sports and cultural event sponsorship, social networking, online advertising and point-of-sale displays are all platforms that have been used to promote e-cigarettes (World Health Organization, 2014). In the USA, all three major tobacco companies (Altria/Phillip Morris, RJ Reynolds and Lorillard) have substantially contributed to the industries advertising expenditures after acquiring e-cigarette brands. For instance, when Lorillard purchased the e-cigarette brand "Blu" in 2012, advertising expenditures for e-cigarettes increased by $12 million from 2011 to 2012 (Abigail Halperin et al., 2015). In the UK, total e-cigarette advertising expenditures reached £13.1 million in 2012 compared to £1.7 million in 2010. As in the case of the USA, the advertising expenditures have increased as the tobacco industry gets more involved. A British American Tobacco subsidiary reportedly spent £3.6 million in only two months to promote its "Vype" e-cigarette brand.

As the Tobacco industry has sought to take ownership of the e-cigarette market they have also acquired some successful independent suppliers. Since e-cigarettes entered the UK market in 2007, several e-cigarette start-ups and over 250 independent suppliers have surfaced mostly using online channels to promote their business (Bauld, Angus, & De, 2014). Online promotion of e-cigarettes has been shown to be effective as it is the platform where a large proportion of them are sold. Zhu et al., (2014) found evidence indicating internet sales to account for 30-50% of total e-cigarettes sold. However, numerous e-cigarette stores both physical and online, operate without authority as e-cigarette regulations have yet to be fully established. The e-cigarette regulations are the subject of the following sub-chapter.

1.7. E-cigarette Regulations

Despite the lack of scientific evidence to support policy development, the political environment concerning e-cigarettes continues to evolve. E-cigarettes are typically regarded as either medicines or a tobacco products, depending on the countries government policy. Some policies are based on the belief that e-cigarettes will reduce the harm of conventional smoking whereas others have increasing concerns of smoking renormalization. Therefore a considerable pressure is put on policymakers in many countries to serve as the relevant regulatory guides. In the following subchapters, the current e-cigarette regulations in the European Union, The United Kingdom, The United States and Scandinavia will be addressed.

1.7.1. European Union

In March 2014, The Council of the European Union approved a revised EU tobacco product directive (TPD) after three versions had previously been under consideration (European Commission, 2014). The new directive set out many instructions concerning e-cigarettes and their safe use, manufacturing and marketing. According to the directive, e-cigarettes and their refill containers should be regulated within the member states. E-cigarette manufacturers and importers are required to inform on relevant products before entering the market and label their products with the sufficient and relevant information. Any misleading elements or features should not be displayed whereas the appropriate health warnings, similar to the ones on conventional cigarette packages, should. To further improve on human health protection and safety and the potential health risk when in hands of children, e-cigarettes and container products are required to be childproof and tamperproof. In addition, limitations have been put on liquids containing nicotine as nicotine concentration must not exceed 20mg/ml. This specific amount is equivalent to the nicotine dose derived from a standard cigarette (European Commission, 2014).

Concerning the e-cigarette marketing, the EU tobacco product directive seems relatively underdeveloped. Differences on advertising laws and practices within member states concerning e-cigarettes contradicts the free flow of goods and freedom to provide services and competition. The directive states that due to the growing market of e-cigarettes, it is necessary to approximate the national provisions on advertising and adopt a restrictive approach (European Commission, 2014).

The new directive will not harmonize all aspects of e-cigarettes and refill containers as much has been discussed about flavored cigarette products and their

potential attractiveness to youth and non-smokers. For instance, the member states bear the responsibility for adopting rules on flavors (European Commission, 2014). Specific dates for enactment are yet to be determined but member states require legislation by 2016 with full compliance by 2017. In practice, depending on how the TPD is interpreted, this means that suppliers will presumably face higher manufacturing cost and greater marketing restrictions by the year 2017 (Britton & Bogdanovica, 2014).

1.7.2. United Kingdom

After a thorough process of consultation since the year 2010, the United Kingdom Medicines and Healthcare Products Regulatory Agency (MHRA) announced a plan in 2013 to regulate e-cigarettes as medicines. From 2016, e-cigarettes and other nicotine-containing products were to be regulated by function and thus require pure medicinal manufacture and delivery standards with clear advertising controls (Britton & Bogdanovica, 2014). By installing the new policy, the United Kingdom positions e-cigarettes as a nicotine replacement therapy aiming for smoking cessation, stating:

> The consistent evidence from a variety of sources is that most electronic cigarette use is to support stop smoking attempts or for partial replacement to reduce harm associated with smoking. The current evidence is that electronic cigarettes have shown promise in helping smokers quit tobacco but the quality of existing NCPs [nicotine containing products, how MHRA labels e-cigarettes] is such that they cannot be recommended for use (Medicines and Healthcare Products Regulatory Agency, June 12, 2013).

This interpretation is comparable to other nicotine replacement products such as gums, patches and inhalers, which are licensed as medicines. However, MHRA proposed its plans before the Council of the European Union approved the Tobacco Products Directive in 2014 as mentioned in the subchapter above. To deem all nicotine products as medicines by function will thus be closed off. In contrast, the option of applying for a medicines marketing authorization will remain open (Britton & Bogdanovica, 2014).

1.7.3. United States

As of January 1st, 2015, e-cigarette products remained unregulated by the US Food and Drug Administration (FDA) and other federal authorities. After the U.S. Court of Appeals decided that the FDA could not regulate e-cigarettes as drug delivery devices, the FDA currently aims to regulate them as tobacco products. However, the FDA does not have a say as to where e-cigarettes may be used. That authority remains with the

domain of state and local governments, where most prior smoke-free laws have been enacted. With a system such as this, the states and municipalities differ greatly concerning the laws currently in effect that regulate where e-cigarette use is prohibited. For instance, three states (North Dakota, New Jersey and Utah) have prohibited the use of e-cigarettes in 100% smoke-free venues (American Nonsmokers' Rights Foundation, 2015) and a total of 41 states have laws restricting e-cigarette sales to minors (National Conference of State Legislatures, 2015). These numbers showcase the rapid increase of e-cigarette legislations from the domain of state and local governments. For example, in November, 2013, only 25 states had passed laws restricting e-cigarette sales to minors (R. Grana et al., 2013).

1.7.4. Scandinavia

One of the things all Scandinavian countries (Denmark, Norway, Sweden and Finland) have in common is that e-cigarettes are defined and treated as medicines. However, in these countries the sale of e-cigarettes containing nicotine cartridges remains illegal. A specific marketing authorization for e-cigarettes is required for them to be allowed for distribution. Currently, no marketing authorization for e-cigarettes has been issed up to date (Danish Health and Medicines Authority, 2014; Euromonitor International, 2014; Medical Press, 2014).

In addition to its geographical proximity to Iceland, Scandinavia represent a group of countries with regulatory environments typically similar to Iceland's regulatory environment (The Nordic Minister Committee, 2004). The external environment in regards to e-cigarettes in Iceland is the subject of next chapter.

2. E-Cigarettes in Iceland

Iceland is a country where e-cigarettes have yet to be introduced for a general market sale in their complete form. In this chapter on e-cigarettes in Iceland, the elements effecting future e-cigarette distribution in Iceland are addressed. In addition to an overview of the relevant regulations and the medicine industry, an analysis on competitive forces is provided.

2.1. The External Environment

In Iceland, e-cigarettes have until now only been sold with flavored non-nicotine containing liquids through minor independent suppliers. Presumably the largest one, "Gaxa," imports e-cigarettes and has set up a well-established online shop on the

Icelandic internet domain "www.gaxa.is". On the website consumers can choose from a wide variety of e-cigarettes and the relevant accessories, except for nicotine containing liquids (Gaxa, 2009; The Icelandic National Broadcasting Service, 2013). Online shops in Iceland can be particularly effective as internet penetration rate in the country is over 99%, representing the fourth highest rate in the world (Internet Live Stats, 2015).

Since 2009, the Icelandic Medicine Agency has reiterated that nicotine liquids used in e-cigarettes are declared as medicines (Icelandic Medicines Agency, 2009a). According to Icelandic legislation, e-cigarettes with nicotine thus fall under the following medicine definition:

> A substance or a chemical composition that has the ability to effectively treat diseases on people or animals; or as a preventive measure against diseases; or a substance or a chemical composition that can be used for or given to people or animals, either with the purpose of recovering, fixing or changing a physiological activity caused by a pharmacologic or an immunologic reaction; or reaction on metabolism or to confirm a diagnosis (Althingi, 2015).

When it comes to the importation and distribution of medicines, consumer protection is a fundamental policy. With the EEA (The European Economic Area) agreement, Iceland deployed the EU legislation concerning medicines. The legislation requires medicines sold in Iceland to have the relevant marketing authorization (Icelandic Medicines Agency, 2015). The importation and distribution of medicines without a marketing authorization is a violation of the pharmaceutical products act. In addition, all online purchasing on medicines are unauthorized. A marketing authorization (MA) is a certification for pharmaceutical organizations allowing them to put a specific medicine on the market and sell it. Until the time of publication, no marketing authorization has been issued for the e-cigarette nicotine liquid hence all importation for market distribution is intercepted by the Icelandic customs tariff (Icelandic Medicines Agency, 2009a, 2009b, 2014c). Moreover, when applying for a marketing authorization, all data and materials about elements such as production, toxic effects and function need to be included, as this information needs to be accessible for local authorities. Additional requirements demand that information on a given medicine needs to be available for healthcare personnel and patients written in the native language. As a security measure this information is essential due to potential misusage or side effects caused by the medicine (Icelandic Medicines Agency, 2014a). Currently, no nicotine liquid in any form has fulfilled this set of

requirements and therefore it is still unforeseen when any organization, Icelandic or foreign, will be able to acquire a marketing authorization for e-cigarettes (Icelandic Medicines Agency, 2015). Given that marketing authorizations for e-cigarettes will be available, they are also widely expensive. A marketing authorization for a medicine solely meant for distribution in Iceland typically costs around 4 million ISK (US $ 29,000). However, firms with established business connections are able to join in on a marketing authorization application from other European firms in the same business. In that case, the cost typically ranges from 200,000 – 400,000 ISK (US $ 1500 – 3000) (Guðmundsson, 2015). This is the most common gateway for Icelandic medicine companies/intermediaries, which in turn represent and take care of distribution of the given medicine/drug for the large international company in the Icelandic market (Guðmundsson, 2015). In that case, the representative company acquires a wholesale distribution authorization for the given medicine which has precise restrictions similar to the marketing authorization application (European Union Law, 2013). Medicines are products requiring sophisticated logistic processing on their way from the original supplier to end consumers. They require the involvement of intermediaries where they are carefully examined before distribution. In addition, it is mandatory for those pharmaceutical intermediaries to have a certified ISO (International Organization for Standardization) quality system (Itkar, 2008). The ISO quality system covers activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem (e.g. pharmacovigilance). In addition, it monitors the specific requirements of temperature (typically +15-22 C°), samples, medical information, complaints handling and recalls (World Health Organization, 2015b).

As for the importation of nicotine liquids for personal use, the same rules apply as for other medicines containing nicotine. According to regulations nr. 212/1998 (Code of Federal Regulations, 1998), e-cigarettes shall have been provided legitimately and solely meant for personal use. Customs officers are authorized to request confirmation on whether they were provided legitimately and whether they are needed in the exact quantity in question. With a post delivery, one is able to import a quantity of e-cigarette nicotine liquids that corresponds to use for 100 days. This, however, only applies to deliveries from countries within the European Economic Area (EEA). As for personal travel luggage, one can bring the same quantity of e-cigarettes to Iceland, from countries both within and outside the EEA (Icelandic Medicines Agency, 2014b).

Despite a difficult situation concerning the marketing authorization, Icelandic pharmaceutical companies may still gain an opportunity for e-cigarette marketing in the coming years. The Iceland Chamber of Commerce has recently issued its intention to abolish the ban on television advertising on over-the-counter (OTC) medicines. NRTs currently sold in Iceland are classified as OTC medicines and if e-cigarettes (containing nicotine liquids) were to enter the Icelandic market, they are expected to fall under the same category. Therefore, if an Icelandic pharmaceutical company will acquire a marketing authorization for e-cigarettes, they will not only be able to sell them, they will most likely be able to advertise them on national television (Iceland Chamber of Commerce, 2015).

2.2. Competition Analysis

If Artasan were capable of obtaining a marketing authorization and were to import and distribute e-cigarettes in Iceland, it is relevant to evaluate the possibilities of competition. For a competitve analysis, Micheal E. Porter identified five forces that determine the intrinsic long-run attractiveness of a market or market segment (Porter, 1998). Figure 5 demonstrates Porter‘s five forces which are: potential entrants, substitutes, buyers and suppliers and industry competitors.

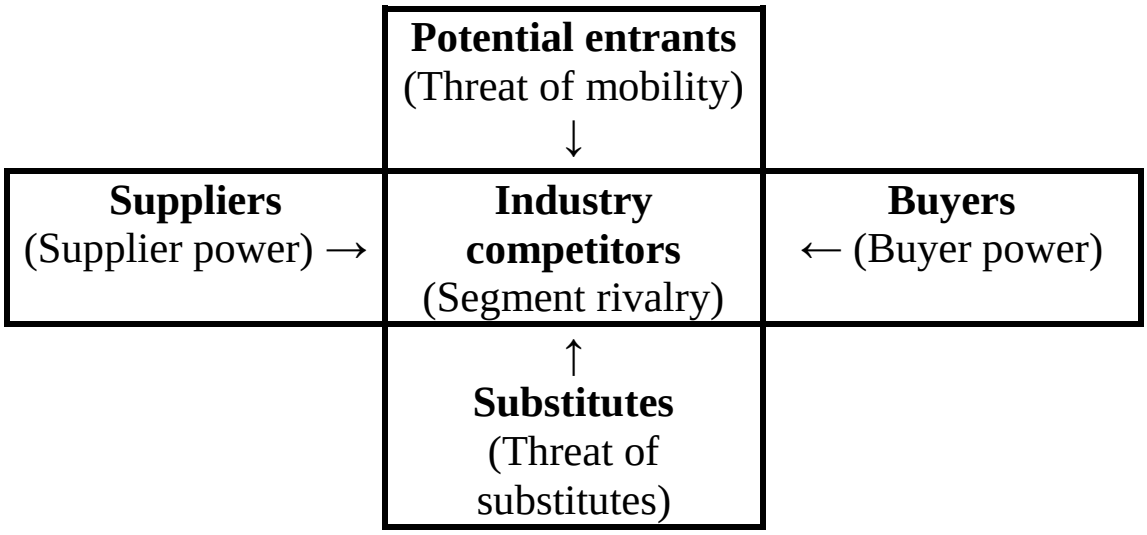

Figure 5. Five forces determining segment structural attractiveness. Reproduced from (Porter, 1998).

2.2.1. Threat of Potential Entrants

When entering new markets such as Iceland, threats are relevant in any industry, including the nicotine replacement one. Key entry barriers are generally economies of scale, capital requirements, switching costs and access to distribution (Jobber, 2007). The most attractive segment is one in which entry barriers are high and exit barriers are low

whereas the least attractive one is the exact opposite. Where entry barriers are high, few new firms are able to enter the industry. However, if one of these few companies performs poorly, they can easily withdraw in the case that the exit barriers are low (Wilson & Gilligan, 2012).

Although Gaxa have already sold e-cigarettes (without the nicotine liquid) effectively for two years, it is too small of a business to gain from economies of scale despite the free adjustment of prices (not government controlled). Furthermore, given that nicotine liquids will be allowed for importation and distribution, it is difficult to determine whether Gaxa is fit for the capital requirements involved. Due to nicotine liquids being defined as medicines, Gaxa would require a great operational change. Firstly, for them to be able to purchase nicotine liquids from foreign suppliers, they would need to implement a medicinal quality distribution system, or purchase them from a domestic intermediary which has one. Secondly, with presumably few established connections with foreign pharmaceutical companies, it would prove difficult and expensive for a small company such as Gaxa to provide itself with a wholesale distribution authorization. Artasan, however, together with its sister and mother companies, is one of the few capable in the nicotine replacement segment to capitalize these requirements. For them, it will presumably be more straightforward to provide a marketing authorization for nicotine liquids than companies such as Gaxa. In collaboration with foreign organizations, Artasan already holds a wholesale distribution authorizations for Nicotinell NRTs currently being sold in the Icelandic market. In addition, their sister company Distica, specializes in logistics, warehousing and distribution of pharmaceuticals where they are Iceland's leading player with a total share of 70% of the Icelandic market. In addition, Distica currently follows the ISO 9001 standard which is highly specific and customized to pharmaceutical products (Distica, 2015). Therefore, the threat of capital requirements would presumably serve in favor of Artasan over other competitors.

2.2.2. Threat of Substitute Products

Further factors contributing to the attractiveness of the market include potential substitute products. If actual substitutes exist, they place a limit on prices and profits. Furthermore, if there were to be technological advancements in the substitute industries, prices may fall further while competition increases (Wilson & Gilligan, 2012).

E-cigarettes were produced as a technologically advanced substitute product for conventional cigarettes. Therefore, conventional cigarettes are the substitute product most relevant to e-cigarettes. However, the use of cigarettes is constantly decreasing among

Icelanders due to their severe health risks that e-cigarettes should help to reduce even further. E-cigarettes would also be less expensive to use. Moreover, e-cigarettes are meant for nicotine replacement and thus would enter into a direct competition with already established NRTs. The established NRTs available in Iceland are in many varieties where its users can choose their methods of nicotine intake (Guðmundsson, 2015). However, e-cigarettes may potentially gain popularity by their behavioral attributes being similar to the use of cigarettes. On the other hand, nicotine addicts attempting to quit the use of moist snuff may choose the NRTs rather than e-cigarettes due to similar behavioral reasons. These factors among others are discussed further in the coming chapters.

2.2.3. Threat of Buyers' Growing Bargaining Power

The attractiveness of a market segment also depends on the buyers' strong or growing bargaining powers. Their bargaining power, for example grows in the case of the following examples: the product reflects a significant fraction of the buyers' costs; the product is undifferentiated; buyers' switching costs are low; and buyers are price sensitive due to low profits (Wilson & Gilligan, 2012).

In the case of NRTs, Artasan's customers are almost solely pharmacies. Only NRTs with the lowest nicotine concentration and the smallest packages are allowed to be sold in retail stores outside of pharmacies. These low concentration NRTs account for only 6% of all NRTs sold in Iceland (Icelandic Medicines Agency, 2014d). Presumably, the same would apply for e-cigarettes.

Although there are few OTC pharmaceutical intermediaries such as Artasan, the pharmacies' bargaining power is high. Currently there are two large medicine companies dominating the market, *Lyfja* and *Lyf og Heilsa* with a combined market share around 70% (Icelandic Business Paper, 2011). They have the dominant bargaining power over companies, such as Artasan, on which and for what price medicines are sold in their pharmacy outlets. Retailers' bargaining power would also be high against Artasan despite the regulations on low concentration and small packages. Retail stores provide companies such as Artasan a valuable opportunity of promoting OTC pharmaceuticals such as NRTs outside pharmacies (Guðmundsson, 2015).

2.2.4. Threat of Suppliers' Growing Bargaining Power

In a segment where suppliers are easily able to raise prices or reduce the quantity supplied, an entry is unattractive. Suppliers may gain a position such as this when the

supplied product is an important input and few substitutes are available (Wilson & Gilligan, 2012).

If nicotine liquids obtain a status where they fulfill the requirements of marketing authorizations, various large international pharmaceutical companies will presumably apply and receive those authorizations. As in the case of NRTs, Artasan would be able link themselves to the marketing authorization of one of those large companies and gain a wholesale distribution authorization in the Icelandic market. Artasan already has good connections with large pharmaceutical companies in regards to their current distribution of NRTs. However, large tobacco companies are equally as likely to gain marketing authorizations for e-cigarettes. No established connections are between tobacco companies and Artasan (Guðmundsson, 2015).

2.2.5. Threat of Intense Segment Rivalry

If a segment already contains numerous strong competitors with high stakes on staying in the segment, the segment becomes less attractive. This is even more so if the segment is in a stable condition or declining (Wilson & Gilligan, 2012).

Currently, no company has authorization to sell e-cigarettes containing nicotine liquids in Iceland. Consequently, the segment currently has no strong competitors, except for the possibility of illegal activity. Given the sale of e-cigarettes containing nicotine will be authorized, Artasan may firstly face similar competition as they do in the case of NRTs. Those companies are, however, few of note. Artasan holds a wholesale distribution authorization for Nicotinell, Vistor (Artasan's sister company) holds an authorization for Nicorette and Icepharma holds an authorization for Nicovel. Nicorette and Nicotinell are by far the biggest in regards to market share with 44% and 45% whereas Nicovel accounts for 1% in the NRT market in Iceland (Guðmundsson, 2015).

Due to the involvement of tobacco companies in the world of e-cigarettes, there are several other Icelandic companies that may evolve into future competitors as well. Companies such as *Íslensk Ameríska* and *Globus* have a market distribution authorization for various tobacco products in Iceland and have established connections with large international tobacco companies. Finally, as mentioned above Gaxa may be capable of growing to become a future competitor despite the large capital requirements and the operational change involved.

3. Research Questions

In the first two chapters above, e-cigarettes were introduced and their conditions in regards to the external environment assessed. Although e-cigarettes have been inconspicuous in Iceland, they have become increasingly popular in the world market, especially in the USA and Europe with increasing use every year. Although e-cigarettes will most likely be classified as tobacco products such as in the EU, they still remain unregulated in the USA while northern countries classify them as medicines (Scandinavia and Iceland). The development of cigarette use in Iceland was also addressed where data from Statistics Iceland have shown that cigarette consumption among Icelanders are of decreasing concern. Daily cigarette use is currently only at 11.6% which is a decrease by over 20% since 1987 and much lower than in most European countries. With the success in anti-tobacco measures, NRTs currently available in Iceland have potentially contributed more than they are credited for. Evidently, sales of NRTs have been increasing alongside the decreasing use of cigarettes. In addition, use of NRTs in Iceland is much higher than in neighbor countries. Evidence such as those are constructive in regards to the potential market entry of e-cigarettes into Iceland. However, many more questions need to be answered before one can advise against or in favor of importing e-cigarettes. With the addition of a thorough literature review and an empirical study, answers can be provided to the following research questions.

1. Is the importation and distribution of e-cigarettes in the Icelandic Market advisable in regards to health and prosperity?
2. Would the distribution of e-cigarettes damage the image of a recognized Icelandic pharmaceutical company?
3. Given conditions in the external environment, what is the most effective and proper way of promoting e-cigarettes in Iceland?
4. Are e-cigarettes a superior choice for nicotine replacement in Iceland compared to other NRTs?

4. Literature review

E-cigarettes are relatively modern products and thus have a short empirical history. Their fundamental purpose is to decrease the consumption and thus health risks of conventional cigarettes. However, due to numerous factors, e-cigarettes have become a highly controversial item resulting in considerable amount of peer-reviewed literature

having been written up to date. Several studies have revealed the benefits of using e-cigarettes as a healthier alternative and as a smoking cessation aid while other studies demonstrate its potential risk factors. However, study findings seem to demonstrate concurrent evidence of e-cigarettes effective function of substituting conventional cigarettes. Results from a study where e-cigarette behavior alterations over time were analyzed, suggested that e-cigarette use is a stable long-term behavior. During a course of a year, Etter & Bullen (2014) provided detailed information on the natural behavior of a large international group of e-cigarette users. Evidently, most e-cigarette users were former smokers comprising 72% of the sample. According to findings, only 6% of former smokers had relapsed to smoking after one year while using e-cigarettes. Among dual users[2], 22% stopped smoking after one month and 46% after one year. Among dual users who still smoked during follow-up, cigarette consumption decreased by 5.3 cigarettes on average after one month. Another study demonstrated similar results where the duration of e-cigarette use was shown to predict tobacco-related outcomes. According to findings from the study of Lechner et al. (2015), increased duration of e-cigarette use significantly decreased the daily consumption of conventional cigarettes among current e-cigarette users. These findings further support the evident notion that with e-cigarette use, individuals are often able to reduce or quit the consumption of conventional cigarettes. Etter (2015) improved on his studies when he examined the effectiveness of e-cigarettes on the craving for tobacco among recent quitters[3]. Results suggested that higher nicotine concentration in refill liquids produced the strongest attenuation of craving for tobacco. More intensive use, high voltage batteries, more puffs per day and more refill liquid were factors also associated with the increasing strength of e-cigarettes on lowering tobacco craving.

Few studies have compared the effectiveness of e-cigarettes to established NRT products. Among 40 adult dependent smokers of 10 or more cigarettes per day, Bullen et al. (2010) measured the short-term effects of e-cigarettes versus a nicotine inhaler and a placebo on the desire to smoke. Before use of each product, participants experienced an overnight smoking abstinence. Results indicated no difference in desire to smoke between the 16mg e-cigarette and the nicotine inhaler. Compared to the placebo, e-cigarettes induced a less desire to smoke among participants after use. Further findings suggested e-cigarettes to be more pleasant to use and produced less irritation of mouth and throat

[2] Participants who both smoked and used e-cigarettes daily
[3] E-cigarette users who had quit smoking within two months prior to investigation

than the inhalers. At last, by measuring the increase in serum nicotine, e-cigarettes were found to have a pharmacokinetic profile more similar to the proven Nicorette inhalator than a tobacco cigarette. In 2013, the perceived efficacy of e-cigarettes as smoking cessation tools versus NRTs was examined using a qualitative design. Users' perception of why e-cigarettes were efficacious in quitting smoking emerged as five themes. These themes were bio-behavioral feedback, social benefits, hobby elements, personal identity and distinction between nicotine cessation and smoking cessation. Participants also reported their personal experience with NRTs compared to e-cigarettes pointing out their ineffectiveness at preventing relapse and negative side effects (Barbeau, Burda, & Siegel, 2013).

According to the above findings, e-cigarettes seem to function the way they are supposed to. They temper the urge for cigarettes among smokers similar to NRTs. However, their health effects and rightful promotion remains to be addressed more elaborately.

4.1. Promotion and Safety of E-cigarettes

The demonstration of superiority over conventional cigarettes has served as the most intriguing marketing theme for e-cigarette brands aimed at experienced smokers. In advertisements, they have commonly been described as "safer," "a healthier alternative" and "harmless" (Andrade, Hastings, & Angus, 2013). In contrast, the scientific community and health organizations are concerned about the safety of e-cigarettes and their use as a possible gateway leading to other tobacco products (R. A. Grana, 2013). The National Institute for Health and Care Excellence has noted that conventional smoking could ultimately be promoted, given that it is marketed in a certain way without regulation (Andrade et al., 2013). Furthermore, some e-cigarette brands such as *Blu* have aired television commercials where e-cigarettes are used by celebrities (R. A. Grana, 2013). With the association of e-cigarettes and celebrities, manufacturers are not only building a socially acceptable brand image, but a socially superior one (Andrade et al., 2013). This has contributed further to the ambiguous brand image and concerning appeal to youth or non-smokers as e-cigarette popularity and awareness is rapidly increasing (Hardcastle & Bennett, 2014). Study findings have brought up concerns on who specifically is aware of e-cigarettes and to whom e-cigarette advertisements appeal. Grana (2013) reported that e-cigarette awareness amongst adolescents is higher than with adults (67% vs. 40%). Furthermore, Kinnunen et al. (2014) found that although the majority of

"ever users"[4] are daily smokers, e-cigarettes are also used by those who have never smoked conventional cigarettes. More notably, "ever use" of e-cigarettes was most common among those who reported having viewed an e-cigarette advertisement. Another recent study reported that two-thirds of smokers indicated an interest in trying e-cigarettes after watching an ad for *Blu* e-cigarettes that focused on the different attributes e-cigarettes have compared to normal cigarettes (Kim, Lee, Shafer, Nonnemaker, & Makarenko, 2013). Hughes et al. (2015) examined the associations between e-cigarette access and smoking and drinking behaviors in teenagers by using a cross-sectional survey of over 16,000 school students in England. One out of every five participants, aged from 14 to 17 years old, were found to have accessed e-cigarettes. A more noteworthy finding is that 15.8% of them had never smoked conventional cigarettes. As a result, more turmoil has been added to the key public health concern on e-cigarettes potentially recruiting children to nicotine dependence.

Alongside increasing popularity and awareness, e-cigarette brands are also growing in numbers. With a comprehensive internet search on English language websites, Zhu et al. (2014) found that between August 2012 and January 2014 e-cigarette brands increased by a total of 10.5 units per month with 242 new flavours introduced. Findings also indicated that messages promoting e-cigarettes have also changed over time. Newer brands were found to be less likely to demonstrate a relative advantage[5] over conventional cigarettes, whereas a compatibility[6] between the two was a more common emphasis. In contrast, a category identified as "top-5 brands" containing the most advertised e-cigarette brands which in fact all pertained to the "older brands" category as well, were much more likely to claim the relative advantage. All top-5 e-cigarette brands claimed to be less harmful and all of them mentioned the advantage of being able to smoke wherever conventional cigarettes are banned. In addition, 4 out of 5 top e-cigarette brands mentioned that e-cigarettes were cheaper to consume. Pokhrel, Fagan, Kehl, & Herzog (2015) examined the associations between e-cigarette advertising, use and harm perceptions using a multivariable model. Findings indicated higher marketing receptivity to be associated with perceptions that conventional cigarettes are more harmful than e-cigarettes. In addition, lower harm perception was found to be associated with higher e-cigarette use. Popova & Ling (2014) demonstrated how harm endorsing messages can

[4] Those who have tried e-cigarettes once or more in their life
[5] A degree to which an innovation is perceived as better than the idea it supersedes (Mehdi, 2014)
[6] The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters (Mehdi, 2014)

prove damaging in promoting e-cigarettes and examined how warning labels effect the perception of nonsmokers' on e-cigarettes. The perceived harm of e-cigarettes among non-users of tobacco products increased significantly when e-cigarette advertisements were labeled with graphical or non-graphical warning messages. The same results were found in the case of moist snuff[7]. The relative advantage versus compatibility subject was further studied where adult smokers' responses to e-cigarette advertisements were examined. Three different samples of smokers indicated their interest in trying e-cigarettes after viewing online advertisements using one of three comparison types. The e-cigarette advertisements emphasized similarity to conventional cigarettes, differences between the two or neither. Results revealed advertisements emphasizing a difference between e-cigarettes and conventional cigarettes to elicit more interest among smokers than advertisements emphasizing similarity (Pepper, Emery, Ribisl, Southwell, & Brewer, 2014).

As for the validity of e-cigarettes' relative advantage that e-cigarette brands commonly promote over conventional cigarettes, evidence for decreased or increased harm with long-term use does not yet exist (Callahan-Lyon, 2014). However, latest studies reveal e-cigarettes to be more harmful than thought at first. A recent study showed that formaldehyde and acetaldehyde, which are two of the cancer causing substances of the normal cigarette, become evident in modern (second-generation) e-cigarettes, when voltage is raised from 3.2V to 4.8V (Kosmider et al., 2014). The comparative efficacy of first and second generation e-cigarettes on reducing symptoms of nicotine withdrawal were later examined. A sample of smokers, all of whom had limited e-cigarette experience were randomized to a cross-over design in which first and second generation e-cigarettes were used on two separate days. A larger reduction in symptoms of nicotine withdrawal was found among participants after using second generation e-cigarettes compared to first generation (Lechner, Meier et al., 2015). In an environmental health study, the oxidant reactivity[8] in disposable components of e-cigarettes such as batteries and cartomizers, was tested. By using a cascade particle impactor[9], a range of particles deriving from the e-cigarette aerosol were measurable. One of the particles from e-cigarette, copper[10], was found to be 6.1 times higher per puff from an e-cigarette than reported previously for conventional cigarette smoke. Oxidant reactivity was also found to be of similar range in

[7] Also known as "dipping tobacco." Typically made from dark fire-cured tobacco (Sfetcu, 2014).
[8] The extent to which an oxidant deviates from a steady state (*Concise Dictionary of Chemistry*, 2012).
[9] A sampling device for particulates in the air (Koren, 2010).
[10] A metal that can be found alone or in many different minerals (*Concise Dictionary of Chemistry*, 2012).

e-cigarette aerosols and cigarette smoke (Lerner et al., 2015). For further health hazardous evidence, a comprehensive inner and outer exposure assessment of e-cigarette emission was conducted during six vaping sessions with nine participants. The concentration of putative carcinogenic polycyclic aromatic hydrocarbons (PAH)[11] in indoor air increased by 20% during vaping sessions. In addition aluminum showed a 2.4 fold increase, and FeNO[12] increased in 7 out of 9 participants. According to these data, e-cigarettes do not seem to be emission free and their pollutants may be of health concern (Schober et al., 2014).

In contrast to the above studies, great health benefits have been found to be associated with the substitution from smoking tobacco to using e-cigarettes. Based on results from the study by Yan & D'Ruiz (2015), e-cigarettes are considerably less harmful than smoking tobacco, indicating that a substitution from smoking tobacco to using e-cigarettes appears to have a positive impact on smokers' health. Compared to conventional cigarettes, e-cigarettes delivered less nicotine to the body and induced lesser increase in the cardiovascular parameters measured. Moreover, the use of e-cigarettes had no impact on the exhaled CO levels, whereas the same levels significantly increased by more than 8 times above baseline, following the use of conventional cigarettes (in this case, Marlboro). Furthermore, in a study using a worldwide sample of participants, former smokers and current e-cigarette users reported to experience significant benefits in physical status and improvements in pre-existing disease conditions. After initiation of e-cigarette use, more than half of the participants reported better breathing, olfactory and gustatory senses, endurance and physical status in general. In addition, 81% of e-cigarette users (former smokers) reported to have made a complete substitution from smoking to using e-cigarettes. This is an especially notable finding as former smokers were found to be highly dependent nicotine users (Fagerström Test for Cigarette Dependence = 7) and were heavier smokers compared to current smokers. In the same study, smoking consumption was also found to decrease among current smokers from 20 cigarettes to 4 per day on average. Finally, roughly 90% of participants considered e-cigarettes less harmful than tobacco and less than 1% found them equally or more harmful than tobacco (Farsalinos, Romagna, Tsiapras, Kyrzopoulos, & Voudris, 2014). Another health study reviewed the most recent available data on e-cigarette liquids and chemistry of aerosols and compared its perceived exposure with occupational safety standards. No evidence

[11] A group of organic compounds known to produce cancer (Lee, 2005).
[12] Fractions of exhaled nitric oxide (*Concise Dictionary of Chemistry*, 2012).

was found indicating that e-cigarette use produces inhalable exposures to contaminants of aerosol that would raise health concerns with the general safety standards of workplaces. The exposures from using e-cigarettes even fell well below the Threshold Limit Values[13] for concern of compounds with known toxicity. However, the personal exposure resulting from e-cigarette use justifies a surveillance of health due to the exposure to contaminants and other declared ingredients (Burstyn, 2014).

Drawing from the text above, e-cigarettes are highly controversial as they have been perceived as possible harm reduction tools for experienced smokers and also as immensely concerning items that can lead to the renormalization of smoking (Abrams DB, 2014). Since the establishment of e-cigarettes, results from longitudinal studies and large surveys have been inconsistent and either supported none or both of these claims (Etter & Bullen, 2014). Moreover, health studies have struggled to display the harmful effects of e-cigarettes, which evidently favored their ambiguous initial promotion (Cahn & Siegel, 2011). Overall, the long-term health impact of e-cigarettes remains to be determined as the currently available data are deemed inconclusive (Callahan-Lyon, 2014).

5. The Marketing Debate of E-cigarettes: Attributes of Innovation

Based on the previous section (4.1.), the innovative marketing of e-cigarettes seems to be one of the elements that heavily contribute to the concerns raised by health organizations and the regulatory environment. First of all, the association between e-cigarettes and celebrities which has been evident in e-cigarette marketing, is shifting e-cigarette appeal to a wider group instead of solely aiming at smokers (R. A. Grana, 2013) . Furthermore, it resembles the years before 1950 when cigarettes were yet to be proven harmful and were promoted as elegant and respectable (Magnússon, 2012). In regards to the behavioral attributes of e-cigarettes, they may certainly and effectively help taking people off smoking. However, they are thought to demonstrate concerning similarities to conventional cigarettes which according to their critics, should not be marketed. Moreover, they are thought to be compatible features to smoking and endorse smoking renormalization (Pepper et al., 2014). On the other side of the debate, e-cigarettes are viewed as essential health improving tools and should be marketed as such. Although

[13] Universally recognized workplace exposure standards

these marketing messages may tell an unproven story, they are at least aimed at smokers and are therefore less concerning. Therefore, e-cigarettes' promotional messages should include their relative advantage features over conventional cigarettes without the desirable features for first time nicotine users (Pepper et al., 2014). Deriving from this debate, there are two different attributes that are generally used to promote the innovation of e-cigarettes. One is the relative advantage attribute, which is the more approved marketing message but not necessarily honest, and the second is the compatibility attribute which is thought to threaten a renormalization of smoking. These two attributes will be addressed further in the following sub-chapter on innovations' rate of adoption.

5.1. Innovation's Rate of Adoption: Relative Advantage vs. Compatibility

A common misconception is that innovations are solely bound to brand-new inventions. An innovation includes the wide range of activities, from basic research, to invention to development and promotional measures contributing to the establishment of a new product or means of production. Moreover, innovations can be also be considered as product or process improvements within a firm (Kamien & Schwartz, 1982). If Artasan were to import products such as e-cigarettes with all its accessories and sell them in Iceland, a market currently with limited access to the product (with nicotine), it would most certainly qualify as an innovation. Apart from the definition, an innovation needs to be communicated through certain channels over time to raise awareness and interest. It is an important type of communication, in that the messages are not only concerned with new ideas but also elements aimed for faster consumer adoption (Rogers, 2003). In some cases, an innovation enjoys a rapid rise in popularity almost right from its first introduction while in other cases an innovation finally becomes attractive years after its establishment. Several elements play a significant role in how fast an innovation is adopted among consumers. An innovation's positioning, its name, and how it matches with values and beliefs of consumers are all factors contributing to an innovation's rate of adoption. The rate of adoption is defined as the relative speed of an innovation's acceptance or endorsement by members of a social community. This can be examined by measuring the number of individuals who adopt a new idea in a specific period, for example a year. Thus the rate of consumer adoption is numerically indicated by the adoption curve steepness. A critical explanation of the rate of innovation's adoption derives from the innovation's perceived attributes. According to research, up to 87% of the rate of adoption can be explained by five conceptually different attributes. Those are:

relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). In the current research, the main emphasis is placed on relative advantage and compatibility. As seen in the above chapters, a few studies, in regards to e-cigarettes, have addressed the two attributes and in some cases compared them. Rogers (2003) explained the relative advantage and compatibility attributes with the following definitions:

> Relative Advantage is the degree to which an innovation is perceived as being better than the idea it supersedes. The degree of relative advantage is often expressed in economic profitability, in status giving, or in other ways. The nature of the innovation largely determines what specific type of relative advantage (such as economic, social, and the like) is important to adopters, although the characteristics of the potential adopters also affect which dimensions of relative advantage are most important (p. 213).

> Compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters. An idea that is more compatible is less uncertain to the potential adopter. An innovation can be compatible or incompatible (1) with sociocultural values and beliefs, (2) with previously introduced elements, or (3) with client needs for the innovation (p. 223).

In past research, studies have demonstrated most support to the relative advantage, compatibility and complexity attributes (Rogers, 2003). Moreover, these three attributes have also been found to be most relevant to technology adoption research (Van Slyke, Belanger, & Comunale, 2004). Meanwhile, the existence of trialability and observability have received somewhat weaker support (Rogers, 2003). Roach (2009) examined consumers involvement with their mobile phone by measuring consumers' perception of the relative advantages, compatibility and complexity associated with mobile phone marketing. Findings suggested relative advantage and compatibility attributes to be significantly associated with consumers' adoption of marketing messages sent via their mobile phone whereas complexity was not. A further support for the innovation adoption attributes was found in the research of Van Slyke et al. (2004). Perceptions of relative advantage, compatibility and complexity were all significantly related to the intention of engaging in web-based e-commerce. Compatibility had the strongest statistical relationship with use intention, followed by relative advantage and complexity. The compatibility attribute was again found to have the most significant influence in the study

by Wu & Wang (2005) in which the behavioral intent of using mobile commerce was examined. However, neither relative advantage nor complexity attributes were applied in that study. As mentioned, the current research will address the relative advantage and compatibility attributes and their role in e-cigarette adoption among Icelandic consumers. Figure 6 depicts a model displaying the variables determining the rate of adoption. The relative advantage attributes of e-cigarettes will be compared to their compatibility attributes in eliciting smokers' interest in trying e-cigarettes.

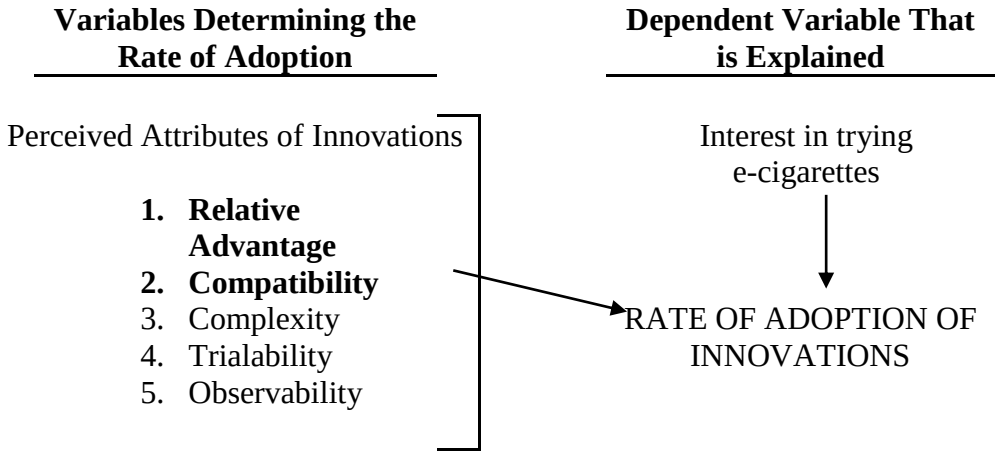

Figure 6. Variables Determining the Rate of Adoption of Innovations. Adapted from (Rogers, 2003).

As this research examines a product currently unavailable to participants of the study, this research model does not study adoption directly. Instead, it examines consumer interest in trying an innovation that presumably becomes available in the future. Tornatzky & Klein (1982) stressed that an ideal research design to predict the rate of adoption for innovations in the future is a design measuring the attributes of innovations (such as relative advantage and compatibility). In addition, the research would be more valuable if data on the innovations' attributes were to be gathered prior to, or concurrently with, a company's/individuals' decision to adopt the innovation. Such is the case in the current research.

6. Empirical Research: Smokers' Responses to E-Cigarette Advertisements

As seen in recent content reviews, studies have found e-cigarette promotion to be most relevant and useful when a relative e-cigarette advantage over conventional cigarettes is applied. In contrast, promotional messages including compatible features to

smoking are causing concerns, due to their presumed appeal. To improve on already existing data, an online experiment was conducted testing the two attributes of the e-cigarette innovation on an Icelandic sample of smokers. Furthermore, this research looks to examine the interest among current smokers in trying e-cigarettes. The perceived advantage of e-cigarettes over NRTs is also examined. Finally, in addition to information on demographic variables such as gender and age, data on the ever use of e-cigarettes and NRTs among both current and former smokers is gathered.

6.1. Hypotheses

The study by Pepper et al. (2014) is the only study that has used innovation attributes to test e-cigarette promotion. Results from the current study are expected to be consistent with his findings where the relative advantage attribute seemed to elicit interest in e-cigarettes more effectively than the compatibility attribute when compared to a control group. Concerning e-cigarette advantage over NRTs, previous findings from Bullen et al. (2010) and Barbeau et al. (2013) indicated e-cigarettes to be more effective than NRTs. Considering findings from these three prior studies, the following two hypotheses are listed.

1. E-cigarette advertisements are expected to elicit more interest in trying e-cigarettes when emphasizing a relative advantage as compared to advertisements emphasizing a compatibility or advertisements emphasizing neither.
2. The perceived advantage of e-cigarettes over NRTs is expected to be higher among participants who have tried e-cigarettes compared to participants who have not.

6.2. Method

6.2.1. Sample

Since 1999, Gallup have conducted an annual survey asking a large panel of respondents about their smoking habits. The panel consists of people who have given prior permission to receive and answer surveys. A total of 1209 participants reported to smoke cigarettes on a daily basis in the years 2012, 2013 and 2014 and thus became target participants for the experiment. From this number, 822 participants (415 males and 407 females) ranging from 21 to 83 years of age participated in the experiment which was conducted in March and April 2015. Participants were cut down to 592 participants who were all undoubtedly current smokers (224 participants reported to be non-smokers and

6 did not want to participate). The sample of current smokers was further divided in three different groups by chance. Group A consisted of 194 participants, B had 186 participants and C contained 212 participants. For this study, data from both current smokers and non-smokers are reported. Of the 592 current smokers, 346 had never tried e-cigarettes whereas 199 had tried (47 did not want to answer).

6.2.2. Setting and System Validity/Reliability

The current research was conducted in collaboration with Gallup, a leading knowledge company in Iceland and sponsored by Artasan, a sales and marketing company for generic and OTC pharmaceuticals. Gallup possesses decades of experience and knowledge in the field of research methodology. Gallup administered the deliveries of e-mails containing the current experiment and recorded the responses from participants. The deliverability of e-mails had also been verified beforehand in accordance with best practices.

6.2.3. Research Design and Intervention

The research was based on an A-B-C two-way between subjects independent factorial design. It consisted of A = relative advantage introduction (advertisement), B = compatibility introduction and C = Control group (emphasizing neither relative advantage nor compatibility). The introductions/advertisements were created by the author with the experiment from the Pepper et al. (2014) study taken into consideration. Each introduction was in the form of an audio clip also displaying an image symbolizing each comparison type via YouTube video. The three introductions were all read out with the same voice. The introduction emphasizing a relative advantage of e-cigarettes over conventional cigarettes, read out: “Electronic cigarettes are cheaper than conventional cigarettes and can be enjoyed wherever you are. Besides, they are much better for your health as they are free of the toxic contents from the conventional cigarette.” The image illustrated a modern silver-colored e-cigarette with a typical medical device attached to a read heart symbolizing improved health (see Figure 13 in appendix, p. 63). The introduction emphasizing a compatibility between the two products, read out: “Electronic cigarettes are very similar to conventional cigarettes. They satisfy all your nicotine needs and you can keep smoking and feel good amongst your friends.” The following image displayed two almost identical cigarettes, one being electronic and the other conventional (see Figure 14 in appendix, p. 63). Finally, the control group introduction, neither emphasizing a relative advantage nor a compatibility between the two products read out:

"Electronic cigarettes are support devices that form a vapor out of a nicotine liquid. They are really comfortable and easy to use." The control group image included a set of e-cigarettes alongside three different chargers (see Figure 15 in appendix, p. 64).

6.2.4. Measures and Procedure

An online experiment was sent via e-mail to participants in the period from 19th of March to the 8th of April. Participants were randomly assigned to one of three conditions in a 1x3 (type of introduction) between subjects factorial experiment. The online experiment was constructed by the author of this thesis, in collaboration with a Gallup consultant. To ensure the sample only consisted of current smokers, and to access the introduction phase, participants were required to answer the question "Do you smoke?" with a "Yes". Participants who responded with "No" were asked whether they had used any of six possible nicotine replacement therapies (NRTs) to quit smoking. The NRTs were: e-cigarettes, chewing gum, patches, nasal spray, inhalers and lozenges in that specific order. The current smokers who accessed the experiment were first asked to listen to an e-cigarette introduction. Afterwards, participants responded to the following first question, "How interested are you in trying electronic cigarettes?" Responses were measured using a seven-point scale ("Vastly interested" (coded as 7), "Very interested" (6), "Somewhat interested" (5), "Neither" (4), "Somewhat uninterested" (3), "Very uninterested" (2) and "Vastly uninterested" (1)). Following the seven-point scale, participants were asked whether they had previously tried any of the six different nicotine replacement therapies with either a "Yes" or a "No." At last participants responded to the third and last item, "As a smoking cessation aid or health aid, would you consider e-cigarettes to be a better option for you than other nicotine delivery systems?" Responses were again collected on a seven-point scale ("Way Better" (coded as 7), "Better" (6), "A little better" (5), "Every bit as good" (4), "A little worse" (3), "Worse" (2) and "Way worse" (1)). To see the Icelandic version of the experiment and online questionnaire, see Figures 13-24 in appendix section 11.

6.3. Results

In addition to descriptive statistics, results are based on both one-way and two-way analysis of variance (ANOVA). The mean scores of each introduction group on e-cigarette interest and e-cigarette advantage are compared along with the interaction of other variables such as gender and e-cigarette ever use. The mean scores of different age groups on the e-cigarette dependent variables will also be compared.

6.3.1. Descriptive Statistics

Table 1

Smokers' frequency analysis of introduction group and gender

Smokers (N = 592)			
Introduction Group	Male	Female	Total
Introduction 1 – Relative Advantage	88	106	194
Introduction 2 – Compatibility	96	90	186
Introduction 3 – Control Group	109	103	212
Total	293	299	592
Non-Smokers (N = 224)			
	Male	Female	Total
	118	106	224

Note: Numbers are adapted from table 4 in appendix p. 69.

The total participants in the study were 822 from which 592 participants reported to smoke currently and thus got access to the experiment. Non-smokers were 224 (118 males and 106 females) and 6 participants did not want to answer. Participants receiving introduction one, emphasizing a relative advantage were a total of 194 (88 males and 106 females). Introduction group number two had the lowest number of participants with 96 males and 90 females. The highest number of participants was in introduction group three, reaching up to 212 (109 males and 103 females). The distribution between genders was overall similar in each of the introduction groups as confirmed below with Levene's test of equal variance.

Participants were also divided into three equally distributed age groups. The youngest age group, ranging from 21 to 26 years of age, contained 195 participants. Age group number two ranged from 47 to 58 years contained 188 participants and the oldest age group three contained 209 participants between 59 and 83 years of age (see table 6 in appendix, p. 71). From the two Likert scales used to evaluate e-cigarette interest and advantage among current smokers, table 2 reveals the frequency and rate of participants (subjects) reporting to each of the seven values.

Table 2

Frequency of smokers reporting on e-cigarette interest and advantage Likert scales

Likert Scale	E-Cigarette Interest (Mean score = 3.61)	Subjects	E-Cigarette Advantage (Mean score 4.75)	Subjects
1	Vastly uninterested	135 (24.9%)	Way worse	33 (9.3%)
2	Very uninterested	42 (7.7%)	Worse	21 (5.9%)
3	Somewhat uninterested	64 (11.8%)	A little worse	8 (2.2%)
4	Neither	116 (21.4%)	Every bit as good	99 (27.5%)
5	Somewhat interested	78 (14.4%)	A little better	46 (12.9%)
6	Very interested	63 (11.6%)	Better	76 (21.3%)
7	Vastly interested	45 (8.3%)	Way better	73 (20.5%)
1-7	Total	543 (100%)	Total	356 (100%)

Note: Subjects are current smokers. Values are adapted from tables 9 – 10 in appendix p. 74.

The mean interest score of trying e-cigarettes among smokers was 3.61. Most participants (24.9%) reported they were vastly uninterested in trying e-cigarettes while the fewest participants reported they were very uninterested (7.7%). In addition, only 8.3% reported to be vastly interested in trying e-cigarettes. The mean score of perceived advantage of e-cigarettes over NRTs was 4.75. Most participants reported e-cigarettes to be every bit as good as NRTs (27.5%) while the fewest thought e-cigarettes were a little worse than NRTs (2.2%). Over half of participants (12.9 + 21.3 + 20.5 = 54.7%) perceive e-cigarettes to be better than NRTs to some extent while only 17.4% (2.2 + 5.9 + 9.3) perceive them to some extent as a worse choice.

Figure 7 reveals the use of e-cigarettes and other NRTs among current and former smokers. The use of chewing gum was found to be most common among both current and former smokers. Over 63% of current smokers reported to have tried nicotine chewing gum whereas 25.4% of former smokers used chewing gum while quitting. The use of e-cigarettes and nicotine patches was also prevalent, especially among current smokers. The same amount of current smokers (36.5%) reported to have tried e-cigarettes and nicotine patches. However, the use of e-cigarettes was more prevalent (10.8%) among former smokers while quitting than the use of nicotine patches (4.7%). Nicotine nasal spray was the least prevalent NRT among both current and former smokers.

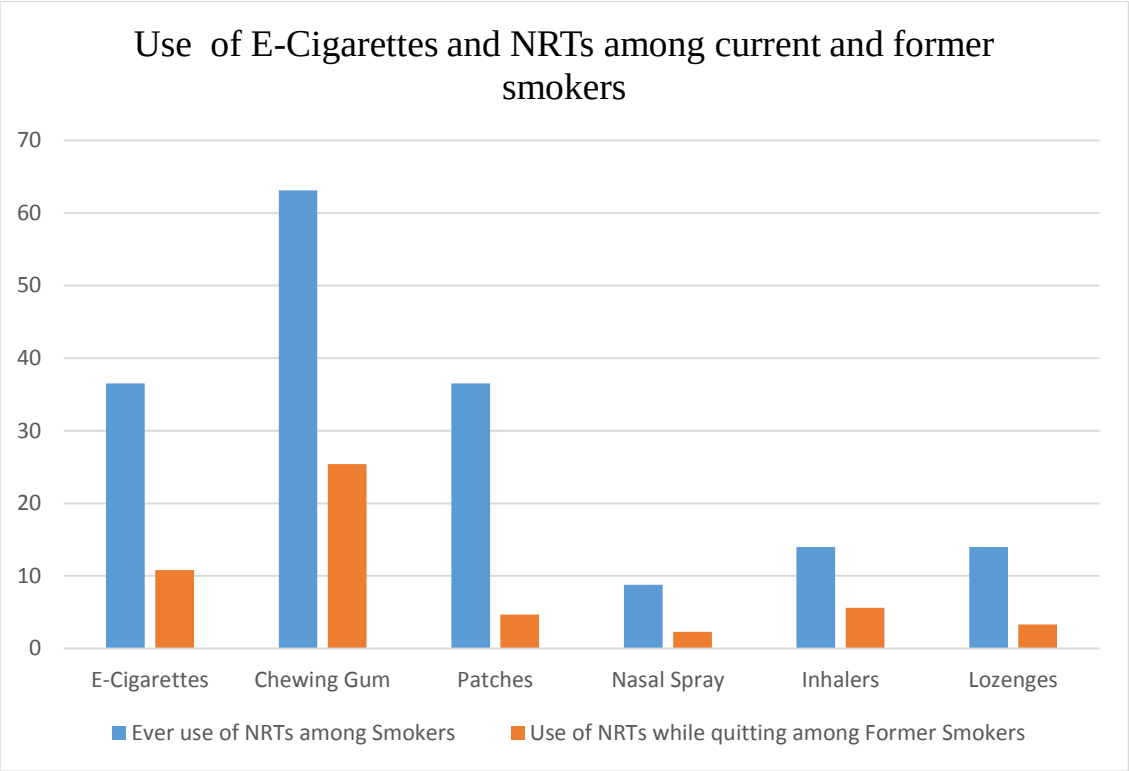

Figure 7. Use of NRTs among current and former smokers. Percentiles are adapted from tables 11 – 21, pp 76 – 79 in appendix.

6.3.2. One-Way Analysis of Variance (ANOVA)

To analyze the difference between the three comparison groups on e-cigarette interest, a one-way between subjects analysis of variance (ANOVA) was performed. Levene's tests were performed to examine the homogeneity of variance with each group. Results showed that the assumption of homogeneity of variance between introductions groups and age groups were both met (see tables 25 and 28 in appendix p 81 and 82).

Figure 8 illustrates the difference between the three introduction groups on interest in trying e-cigarettes. Although introduction one seemed to raise the most interest in trying e-cigarettes among participants the effect of introductions was not statistically significant, $F(2, 540) = 2.07$, $p > 0.05$ (see table 26 in appendix, p. 81). The mean interest score of introduction group one was 3.83, group two scored 3.40, while group three had the mean score of 3.59 (see table 24 in appendix, p. 81).

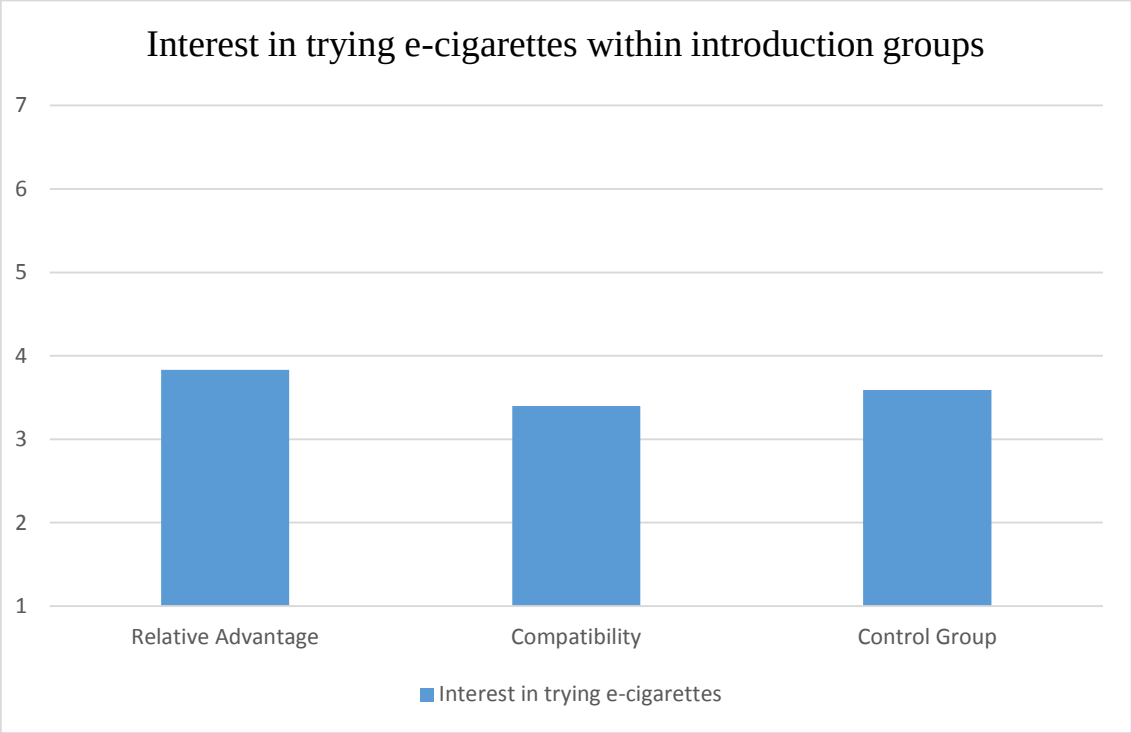

Figure 8. E-Cigarette Interest between Introduction Groups

The difference between age groups on e-cigarette interest was also examined. A significant effect of age groups was found on e-cigarette interest, $F(2, 540) = 8.35$, $p < .01$ (see table 29 in appendix, p. 82). A post hoc Tukey test revealed e-cigarette interest to be significantly higher in the youngest age group (M = 4.02, SD = 2.01) compared to the oldest age group (M = 3.19, SD = 1.90) (see table 30 in appendix, p. 83) at $p < .001$. The youngest age group also reported higher e-cigarette interest than the middle age group (M = 3.64, SD = 1.92) but the difference was non-significant p = .17. Figure 9 reveals these differences between age groups on interest in trying e-cigarettes.

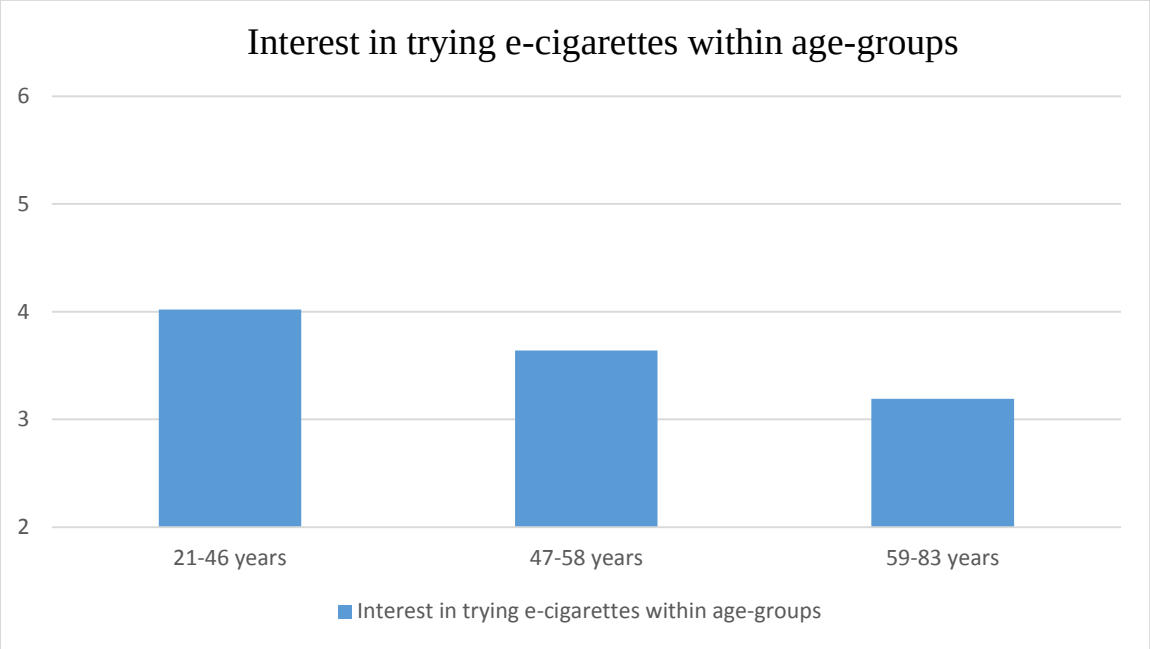

Figure 9. E-cigarette Interest between Age Groups

At last, the difference between age groups on e-cigarette perceived advantage over NRTs was examined. A significant effect of age groups was found on e-cigarette perceived advantage, $F(2, 353) = 3.82$, $p < .05$ (see table 32 in appendix, p. 84). A post hoc Tukey test revealed e-cigarette advantage to be perceived significantly higher in the middle age group ($M = 4.98$, $SD = 1.90$) compared to the oldest age group ($M = 4.34$, $SD = 1.99$) (see table 33 in appendix, p 84) at $p = .03$. The youngest group also reported higher e-cigarette interest ($M = 4.86$, $SD = 1.62$) than the oldest age group but the difference was not significant $p = .07$ (see Figure 27 in appendix, p. 85).

6.3.3. Two-Way/Factorial ANOVA

To further examine the difference between introduction groups on e-cigarette interest and perceived advantage, two-way ANOVA was performed with two other separate variables (gender and e-cigarette ever use). First, e-cigarette interest was examined between introduction groups with the interaction of gender. Secondly, differences on e-cigarette perceived advantage was examined between introductions groups with the interaction of gender and e-cigarette ever use.

The interaction effect between introductions groups and gender on interest in trying e-cigarettes was non-significant F(2, 537) = .51, p = .60. However, there was a significant main effect of gender on interest in trying e-cigarettes F(1, 537) = 13.51, p < .001 (see table 36 in appendix, p. 86). The Games-Howell post hoc test revealed interest in trying e-cigarettes was significantly lower among males (M = 3.29, SD = 1.98) than females (M = 3.92, SD = 1.91) (see table 35 in appendix, p. 86). Figure 10 demonstrates these differences between introductions groups and genders.

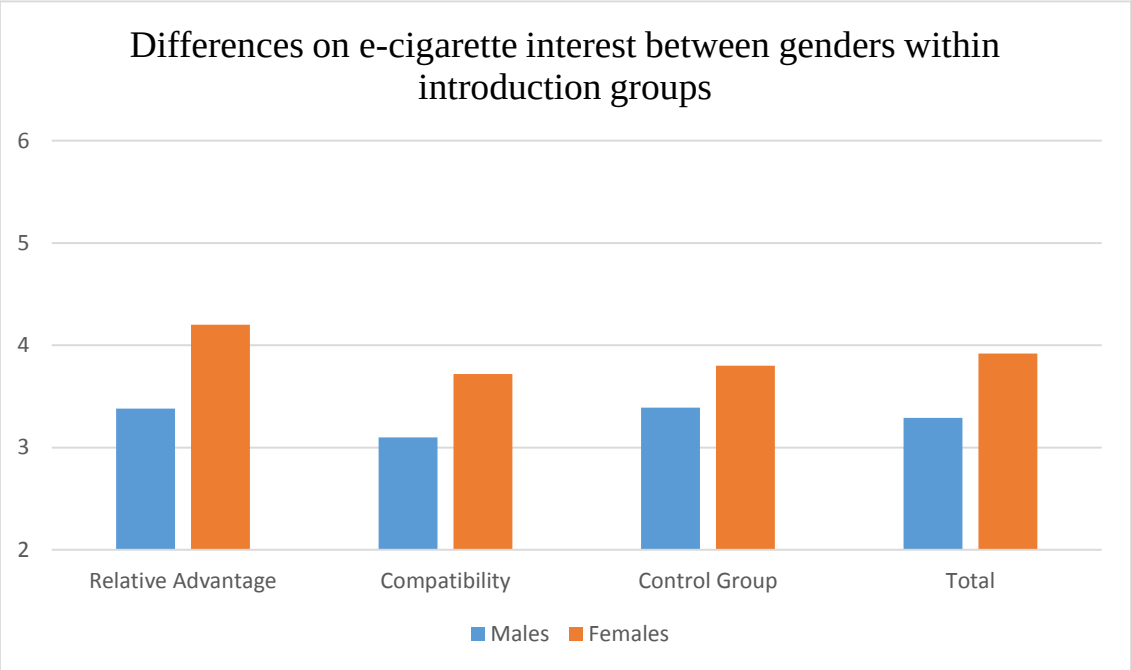

Figure 10. Differences between introduction groups on interest in trying e-cigarettes with the interaction of gender.

Effects on perceived advantage of e-cigarettes was also examined with the interaction of two independent variables. There was a non-significant interaction effect between introductions groups and gender on the perceived advantage of e-cigarettes F(2, 350) = .02, p > .05. The main effect of gender was also not significant F(1, 350) = 1.25, p > .05 (see table 37 in appendix, p. 87). On the other hand, there was a significant main effect of e-cigarette ever use on perceived advantage of e-cigarettes F(1, 350) = 24.36, p < .001 (see table 40 in appendix, p. 88). The Games-Howell post hoc test revealed the perceived advantage of e-cigarettes to be significantly higher among participants who have tried e-cigarettes (M = 5.24, SD = 1.67) than participants who have never tried them (M = 4.29, SD = 1.86) (see table 39 in appendix, p. 88). The interaction effect between introductions groups and ever use of e-cigarettes on perceived advantage of e-cigarettes was, however,

not significant F(2, 350) = .04, $p > .05$ (see table 40 in appendix, p. 88). Figure 11 demonstrates these differences on perceived advantage of e-cigarettes.

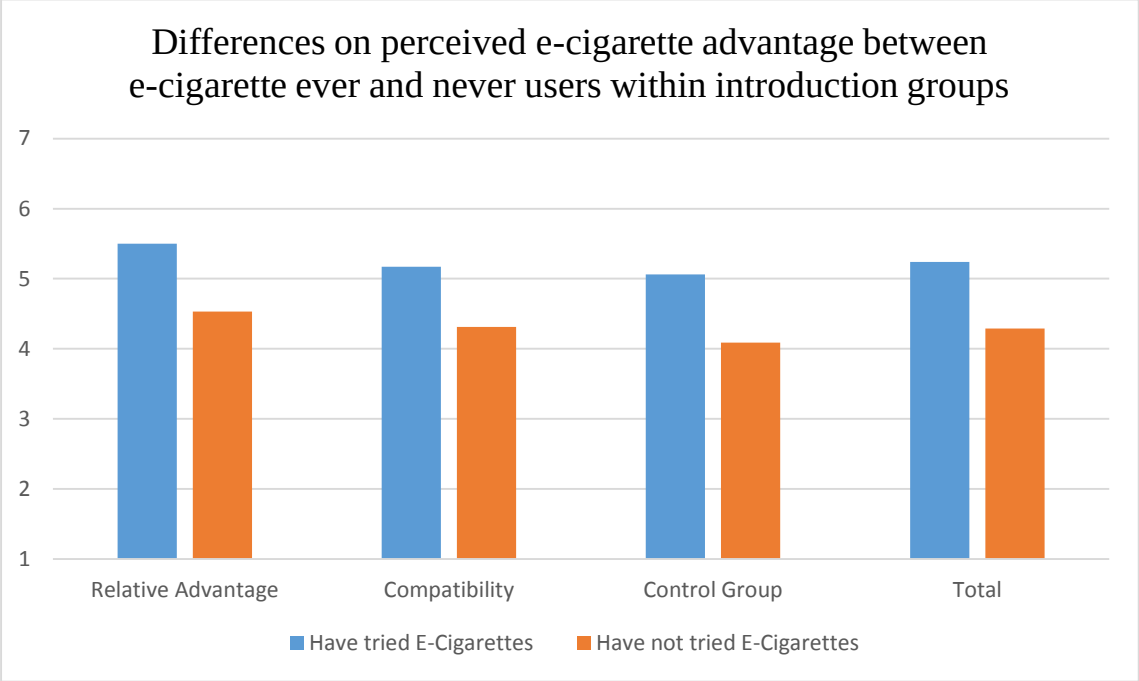

Figure 11. Differences between introductions groups on perceived advantage of e-cigarettes, with the interaction of e-cigarette ever use.

7. Discussion

The current study tested the promotion of e-cigarettes in regards to their attributes of innovation, highlighting a relative advantage and compatibility. Moreover, differences on either e-cigarette interest or perceived advantage among current smokers were compared between age groups, genders and ever and never users of e-cigarettes. Considering results, the experimented attributes of innovations did not seem to raise more interest in trying e-cigarettes nor their perceived advantage over NRTs among current smokers. However, several other factors seemed to affect both interest in trying e-cigarettes and their perceived advantage over NRTs.

Results from one-way ANOVA revealed no difference between the three introduction groups on e-cigarette interest. Although, the introduction demonstrating the relative advantage attribute seemed to raise the most interest among smokers, the difference was not significant. No differences were found between introduction groups on the perceived advantage of e-cigarettes over NRTs either. These results contradict both previous research findings on the subject and the current study hypothesis where the relative advantage attribute was expected to raise the most interest in trying e-cigarettes.

Furthermore, this finding may insinuate that consumers respond equally to an e-cigarette advertisement promoting the relative benefits of using e-cigarettes compared to conventional cigarettes and an advertisement endorsing their past values and experience. As only one of these promotional approaches (compatibility approach) is frowned upon by health organizations, it may be a cause for concern. However, the fact that the two attributes did not differ from the control group either suggests the other variables such as the experiment set-up (further discussed below) might have played a significant role.

When e-cigarette interest and advantage was examined between age groups, fundamental differences were found. Interest in trying e-cigarettes among smokers seemed to be higher with younger smokers compared to older ones. A significantly higher interest in trying e-cigarettes was found among smokers aged 21-46 years old compared to smokers between 59-83 years of age. The interest among smokers in the middle age group between 47 and 58 years of age was also higher than among the oldest age group but lower compared to younger age group. However, these differences concerning the middle age group were not significant. Similar findings were found concerning the perceived e-cigarette advantage over NRTs. The oldest age group seemed to be less convinced that e-cigarettes are a better choice than NRTs compared to younger age groups. A significant difference was found on e-cigarette advantage between the middle age group and the oldest one where the advantage was perceived as lower than in the middle age group. Despite the fact that the perceived advantage of e-cigarettes over NRTs was higher in the youngest age group compared to the oldest age group, the difference was not significant. This may result from a similar situation found in Grana's (2013) study in which e-cigarette awareness was found to be higher among younger participants compared to older ones. Moreover, this finding can be interpreted as a further contribution to the known fear of health organizations that are concerned about e-cigarettes' appeal to youth and non-smokers. However, only participants who currently smoke were measured in this specific study.

A noteworthy difference between genders was also found concerning interest in trying e-cigarettes. Although the general interest in trying e-cigarettes was relatively low, it was significantly higher among female smokers compared to males. The overall mean interest score of females reflected the value "neither uninterested nor interested" whereas the mean score of males reflected "somewhat uninterested." Evidently, this finding indicates that e-cigarettes may be more appealing to Icelandic women than men.

Concerning the perceived advantage of e-cigarettes however, no difference was found between genders.

Lastly, findings from the current study indicate findings consistent to what the second hypothesis in section 6.1 predicted. The perceived advantage of e-cigarettes over NRTs is higher among smokers who have tried e-cigarettes compared to smokers who have not. The perceived advantage of e-cigarettes was significantly higher among participants who had tried e-cigarettes than participants who had never tried them. This result is similar to the ones demonstrated in previous studies where e-cigarettes, compared to NRTs, have been found to be more pleasant to use (Bullen et al., 2010) and where participants have pointed out NRTs ineffectiveness at preventing relapse (Barbeau et al., 2013). In addition, this finding is in a way consistent with another interesting finding from the current study. Although only having been available in the Icelandic market for two years, and despite the distribution of nicotine liquids being illegal, e-cigarettes were found to be the second most used nicotine replacement tool. Among current smokers, only the ever use of nicotine chewing gum was more prevalent than the ever use of e-cigarettes. The same results were found among former smokers where e-cigarettes were the second most used tool in the process of smoking cessation. NRTs, such as nasal spray, inhalers and lozenges were all less prevalent among both current and former smokers while the use of patches was equally as prevalent among current smokers, but less prevalent among former smokers. It should be noted that the sample of former smokers in the current study were participants who had previously reported to currently smoke in the annual sentiment survey. As the sample of the current study derived from respondents of the annual sentiment survey from the past three years (2012, 2013 and 2014), it is expected that most of the former smokers are recent quitters. Therefore, the role of e-cigarettes should not be undermined, as they seem to have already contributed to smoking cessation among Icelanders up to a certain extent.

Both applied and theoretical implications can be drawn from findings of the current study. Most notably, it displays the first empirical evidence of e-cigarette use in Iceland. During the past two years, the use of e-cigarettes has quietly grown more prominent despite the regulations on the nicotine liquid. According to the results, the use of e-cigarettes is presumably more widespread than expected and already seems more common than the use of most NRTs. These outcomes do not only provide implications for Artasan's potential distribution of e-cigarettes in the Icelandic market, they should also prove to be useful for both domestic health organizations and the Icelandic regulatory

environment. As for theoretical implications, a study concerning the promotion of e-cigarettes is a valuable extension to the short empirical history of e-cigarette marketing. Moreover, the study is unique as it compares advertising messages in a sample of current smokers who all had limited access to e-cigarettes. In addition, no study of note has demonstrated a difference between genders in regards to the use of and interest in e-cigarettes.

Despite the applied implications, there are some limitations in the current study that future studies in the field should improve on. As no differences between introduction groups were found, the research setup might partly be at fault. Firstly, during experimentation, participants were required to click "next page" to answer the question relating to the each given introduction. Secondly, the question should have started with "based on the introduction" or "after listening to the introduction." Instead the question was simply phrased, "How interested are you in trying e-cigarettes," with seemingly no relation to the introduction. In future studies, key questions (dependant variables) need to be attributed more directly to the relevant independent variable (in this case, the introductions). The introductions could also be improved as they were only in the form of an audio-clip displaying a freeze image. Future studies can benefit by putting more effort into the introductions/advertisements, for example producing graphic videos that exert greater experiment control (see section 11 for Icelandic version of the experiment and online questionnaire). Finally, findings did not provide evidence on whether recorded e-cigarette use applied to the use of nicotine liquids or flavoured liquids without nicotine. This evidence would have contributed further to the applied implications of the study.

As well as focusing on the health impact of e-cigarettes for long-term and short-term use, future studies should further examine what attributes manufacturers strive to install and how consumers perceive them. Moreover, additional advertisement features that appeal to youth and non-smokers need to be identified where celebrity endorsements and compatibility should be minimized. A potential mutual gain can be reached for health organizations and e-cigarette manufacturers and must not be overlooked as great health benefits could be at stake.

7.1. Critical Success Factors - SWOT Analysis

Within a marketing planning process, a SWOT analysis is one of the most frequently used tools (Wilson & Gilligan, 2012). The evaluation of external and internal resources of an organization (in this case Artasan) can provide a basis to assess new

strategic directions. To draw together the internal strengths and weaknesses with external opportunities and threats, a SWOT analysis should provide a practical insight. Figure 12 displays the factors found to match each category in regards to the potential entry of e-cigarettes under the auspices of Artasan.

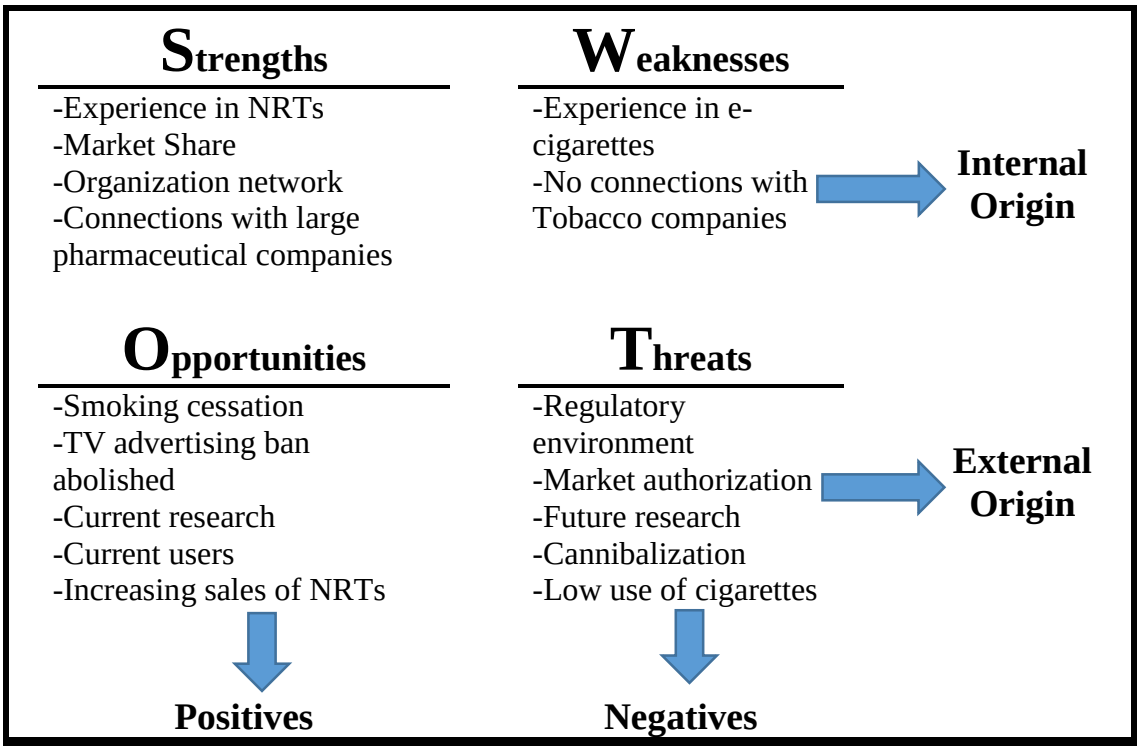

Figure 12. SWOT Analysis on the potential market entry of e-cigarettes in Iceland under the initiative of Artasan

7.1.1. Opportunities

For Artasan to potentially import e-cigarettes there a several appealing opportunities from which the company may reap benefits. First of all, as a market distributor of e-cigarettes in Iceland, Artasan may contribute to a major smoking cessation in the population. Current research findings have exhibited e-cigarettes effective function of substituting conventional cigarettes. It could prove valuable and constructive to their image as a healthcare organization to stand for such health benefits. Moreover, as described in the external environment chapter, Artasan will most likely be able to advertise e-cigarettes on national television due the medicine classification. This would allow Artasan to raise e-cigarette awareness quickly if they choose to do so. Furthermore, the current thesis has illustrated both the increased sales of NRTs and evidence of current e-cigarette use in Iceland. The increased sales of NRTs indicate the increased interest among Icelanders to quit using tobacco and their search for help to reach that goal. The evidence of e-cigarette use and their prevalence already being more common than most

NRTs only further demonstrates the opportunity given to Artasan with market entry of e-cigarettes.

7.1.2. Threats

The most evident threat facing Artasan in regards to potential e-cigarette distribution is the marketing authorization issue discussed in chapter 1.8. Currently, it is unknown when any organization will be able to apply for a marketing authorization for e-cigarettes. Consequently, the future entry of e-cigarettes (with nicotine liquids) into the Icelandic market remains ambiguous. The use of cigarettes is gradually decreasing in an already thinly populated market. Despite the evident increase in sales of NRTs this may threaten the long term profit potential of e-cigarettes. The external image deriving from the potential distribution of e-cigarettes can also evolve in to a threat. Health organizations will presumably remain skeptical of e-cigarettes health benefits over conventional cigarettes and may even publicly condemn their future distributors. Future research may further damage the distribution and image of e-cigarettes if long-term effects of their use were to be proven harmful. Another threat is the possibility of market cannibalization. Market cannibalization refers to the process by which one product takes share from one or more products of the same company (Kotler et al., 2010). As Artasan currently sells a range of NRTs, the introduction of e-cigarettes could potentially take sales from their own products resulting with a decrease in sales of NRTs thus lowering the value deriving from e-cigarette sales. Lastly, the global e-cigarette regulatory environment is still in its rudimentary stage and the same applies to the case of Iceland. If Artasan were to distribute e-cigarettes in Iceland, they could expect various new prohibitive regulations to be taken into effect in the next years, causing their operations to shift considerably.

7.1.3. Strengths

Artasan has several internal resources that may favor them in the process of importing and distributing e-cigarettes in Iceland. Firstly, Artasan is part of a conglomerate (Veritas Capital) that consists of companies that are leading providers of supplies and services to the healthcare sector in Iceland. As mentioned in the chapter on competition (2.2), their sister company Distica is one of the few companies in Iceland currently equipped with the quality control system required in medicine distribution. The collaboration between the two companies and know-how is essential in gaining a future competitive advantage in the e-cigarette segment. In addition to the strong association of

companies, Artasan by itself is well experienced in the NRT segment where they hold a 44% market share. In the NRT and the overall OTC pharmaceutical segment they have established connections with large international pharmaceutical companies which should prove valuable if one of them were to obtain a marketing permit for e-cigarettes.

7.1.4. Weaknesses

There are only a few elements of note in Artasan's operations that can be viewed as internal weaknesses. The fact they have no established connections with large international tobacco companies may prove to be a weakness. Those companies may obtain marketing authorizations for e-cigarettes before pharmaceutical companies, giving opportunities to domestic tobacco distributors to exploit their connections. This may result in other companies acquiring a first-mover advantage[14]. Although it is unlikely, Artasan's inexperience in the e-cigarette market may also prove to be a weakness.

8. Recommendations

In the following chapter, marketing recommendations are provided through the known marketing mix elements. Managerial marketing decisions generally fall into four parameters referred to as the "four P's." The four P's include product, place, price and promotion and are subject to both internal and external constraints of the marketing environment (Chandrasekar, 2010). The author's recommendations to Artasan in regards to the potential market entry of e-cigarettes in Iceland are constructed under each relevant parameter. It should be noted that the recommendations are subject to change as the development of empirical research on the topic of e-cigarettes changes rapidly.

8.1. Product

Artasan should strive to distribute e-cigarette products that are consistent with the set of guidelines indicated in empirical research. For instance, the products should not promote conventional smoking and cause the absolute minimized appeal to youth and non-smokers. In addition, the product should live up to its relative advantages over conventional cigarettes. The most recommended type of e-cigarette for future distribution is the pen-style, medium sized rechargeable e-cigarette addressed in chapter 1.5. It is the most popular type of e-cigarette currently sold in Iceland (Gaxa, 2009). These devices contribute the most to the economic benefits deriving from the substitution of

[14] A firm that pioneers a particular product category by being first to offer it to a market (Hill, Jones, & Schilling, 2014)

conventional cigarettes to e-cigarettes. As mentioned before, besides the starter kit, e-cigarette smoking with refillable nicotine liquids rapidly becomes less expensive than conventional smoking. Moreover, the pen-style e-cigarette does not resemble conventional cigarettes as much as the disposable type but has the same behavioral attributes. These behavioral attributes of the product alongside the future health benefits and nicotine alleviation of cravings are the three elements that the consumer presumably expects to earn with his purchase.

As for the nicotine liquids, it is not recommended to have them flavored except for menthol, fruit and tobacco. Nicotine liquids with cookie, candy, peanut butter, syrup and such flavors are not recommendable, both because they are less popular and yield more appeal to youth and non-smokers than menthol and tobacco flavors. These flavor restrictions would be consistent with the recent EU law on conventional cigarettes by which all flavors except for menthol are to be forbidden. Moreover, this would be a differentiation from competitors such as Gaxa, which has until now only sold flavored liquids, but without nicotine. To add to the case of minimizing appeal to youth and non-smokers, Artasan should consider adding warning labels onto the packages of e-cigarettes and nicotine liquids such as was examined in the study by Popova & Ling (2014). Displaying a warning message, even one that is much less severe than on cigarette packaging, would prove health supporting for experienced smokers, while youth and non-smokers would perceive it as health opposing. Furthermore, the e-cigarettes should be child and tamperproof such as the new EU directive suggests. Finally, considering results from the current study in which females were found to be more interested in trying e-cigarettes, Artasan should consider distributing a design of e-cigarettes that has a certain feminine appeal. This certain design should include features that have evidently more appeal to women than men.

A potential secondary approach should also be considered on the future distribution of e-cigarettes in Iceland. One such example would be to distribute solely nicotine liquids. As the e-cigarette devices are meant for long-term use, the long-term profit potential in a market as little as Iceland seems unreasonable. However, this approach should only be considered in a case where it is ensured that the pen-style e-cigarette is the most popular type of e-cigarette device.

8.2. Place

Currently, the most popular e-cigarette outlet in Iceland is mostly an online store. In the case of Artasan, this distribution method of e-cigarettes is not recommended except for raising awareness. It is essential that e-cigarettes and its accessories will be sold in pharmacies and according to Artasan general manager, this is almost certain given they will be allowed for distribution. Pharmacies are places where almost all NRTs are sold in Iceland. They correspond to the image needed for e-cigarettes to be viewed as health improving products. Offering e-cigarettes among medications, vitamins and other health related products will add a sense of security to consumers that future competitors may be lacking. Furthermore, pharmacies are ideal places to sell e-cigarettes to only those who have reached a certain age. The distribution to the pharmacies through Artasan's sister company (Distica) is already in place if the future e-cigarette market authorizer comes into place. However, as the nicotine liquid is the only part of e-cigarettes (pen-style) requiring a market authorization and a quality distribution system, the e-cigarette devices may be distributed differently. In addition to pharmacies, Artasan should consider offering them in retail stores alongside low concentration nicotine liquids.

Results from both prior studies and the current thesis indicate that e-cigarette interest and perceived advantage is higher among smokers who have tried e-cigarettes compared to those who have not. For this reason, Artasan should consider organizing an event or gathering of some sort where smokers (strictly smokers) are both introduced to and will be able to try e-cigarettes. Within the small sample of smokers in Iceland, this event could greatly influence the perception of e-cigarettes.

8.3. Price

The product's value to the buyer mainly derives from its potential health benefits which current research shows to be substantive. Other value contributors are the behavioral and pleasurable attributes and the fact e-cigarettes are allowed to be used everywhere. Therefore, it is quite astonishing that e-cigarettes are also less expensive to use than conventional cigarettes. Artasan should strive to keep the future price of e-cigarettes and nicotine liquids in a state where its daily use is always cheaper compared to the daily consumption of conventional cigarettes. However, if unmanageable price changes were to occur resulting in e-cigarette use to be more expensive compared to conventional cigarettes, the consequences should not be severe due to the products high value to its buyer. In comparison to future competitors, Artasan should be able to have a

higher price given that they reflect an added sense of security. With the already mentioned quality distribution system and point of sale location in pharmacies, Artasan should be superior to online shops such as the case of Gaxa.

8.4. Promotion

At this point, e-cigarettes have already gained a great share of worldwide attention, especially in the United States and the United Kingdom. E-cigarettes also seem to have raised attention in Iceland where according to findings of this thesis, e-cigarettes are more commonly used than most NRTs. To contribute to further attention, the most obvious promotional channel is through the internet due to the high internet penetration rate in Iceland. Awareness raising activities through social media (Facebook, Twitter etc.) or online advertisements on news coverage websites (visir.is, mbl.is etc.) are recommended. Moreover, if Artasan were to choose a specific time to advertise e-cigarettes through these channels, it should be right before and during wintertime. This is the time when Icelandic smokers would most prefer to enjoy they cigarette in a warm indoor place rather than in the cold weather outside. Within the advertising messages, Artasan should always strive to build a socially acceptable brand image but not a socially superior one. This among other factors described in previous sections, is essential to avoid damaging the image of both Artasan and the whole Veritas Capital conglomerate as a leading provider to the Icelandic health sector.

The abolishing of the TV advertisement ban on medicines presents Artasan with an opportunity to quickly reach out to a vast group of smokers. However, this option is presumably unnecessary and highly expensive.

9. Conclusion

Following the work of the current thesis, it is concluded that Artasan should import and distribute e-cigarettes and its accessories in Iceland, given they reach the required regulatory and manufacturing standard. E-cigarettes represent a highly valuable product in regards to future health benefits and their interest has swiftly grown in related markets. Moreover, numerous studies have demonstrated their effective and comfortable function of substituting cigarettes. Results from the current study also reveal how the use of e-cigarettes has grown in the Icelandic market despite partly being illegal.

Even though recent health studies, such as from Kosmider (2014), have found e-cigarettes to be more harmful than thought at first, their exposure remains much safer

compared with smoking. Also, if future studies were to further demonstrate the danger of e-cigarettes, it is expected to only represent a small fraction of the danger posed by cigarettes. Moreover, Artasan will only distribute and sell e-cigarettes in the Icelandic market if a marketing authorization on the products will be issued. With a market authorization, given the highly specific research and pharmaceutical requirements, one can assume the products should be safe at that point.

However, due to this lack of research, concerns have been raised about the lack of regulations and its appeal to youth or non-smokers. Commercial and branding exploitation of e-cigarettes is threatening their potential health gain just as the regulatory environment together with health organization fear a renormalization of smoking. In support of their argument, research findings have, for example, shown e-cigarette awareness to be higher with adolescents than with adults (Grana, 2013). In addition, the current study found e-cigarette interest to be most common in the youngest age group.

For reasons such as those, Artasan should follow the set of guidelines provided in the chapter on recommendations concerning flavours, warning messages and point of sale location. The symbolic meanings and offerings that consumers associate with e-cigarettes need to become more evident for them to be truly accepted with the public. Otherwise, a product that holds great health benefit potentials could face cynicism or disbelief from consumers, health organizations or governments. The use of e-cigarettes could cause a revolutionary change and has the potential to eradicate smoking related disease and death on the population scale. If Artasan is able to build a business while taking Icelandic people off smoking, the author concludes it as a “win-win” situation and in the public’s best interest.

10. List of References

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11. Appendix

Figure 13. Introduction 1 - Relative Advantage

Figure 14. Introduction 2 - Compatibility

Figure 15. Introduction 3 - Control Group

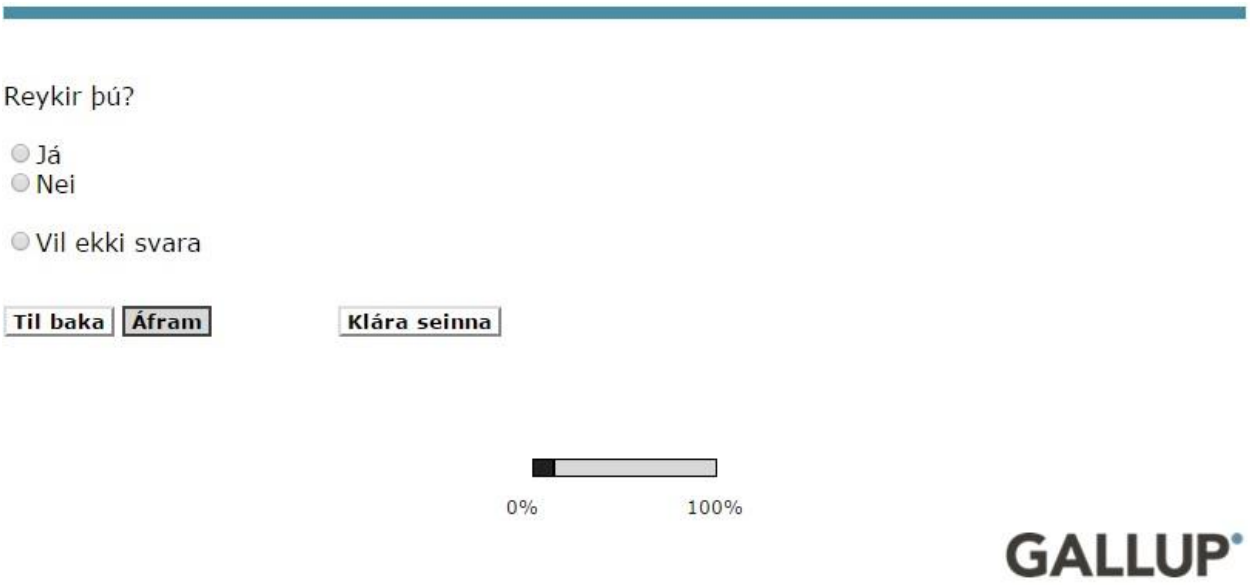

Figure 16. Online Survey - Do you Smoke?

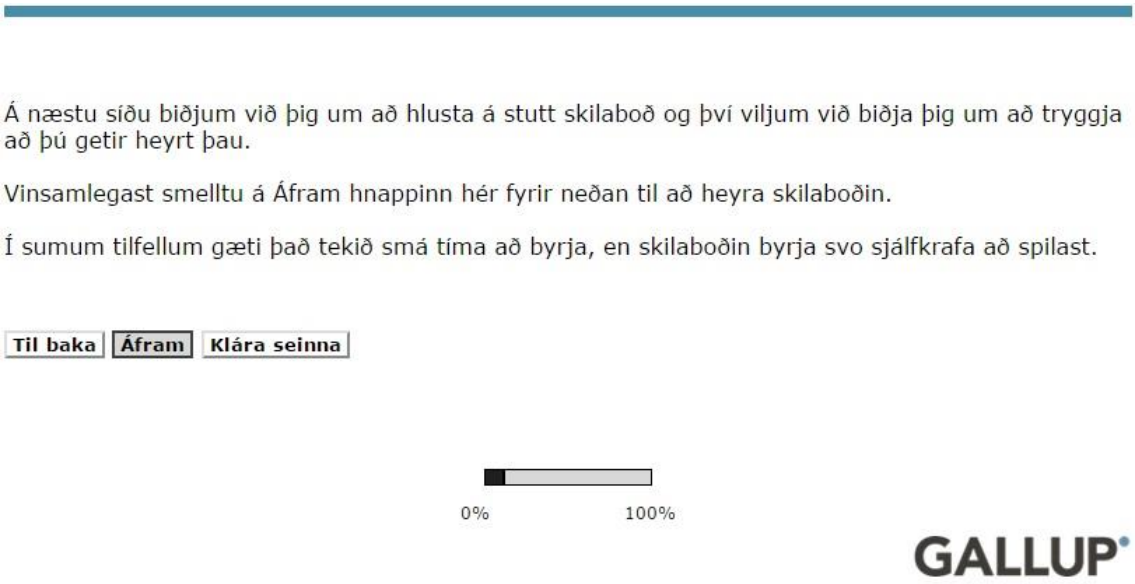

Figure 17. Online Survey - Please Listen to the Introduction

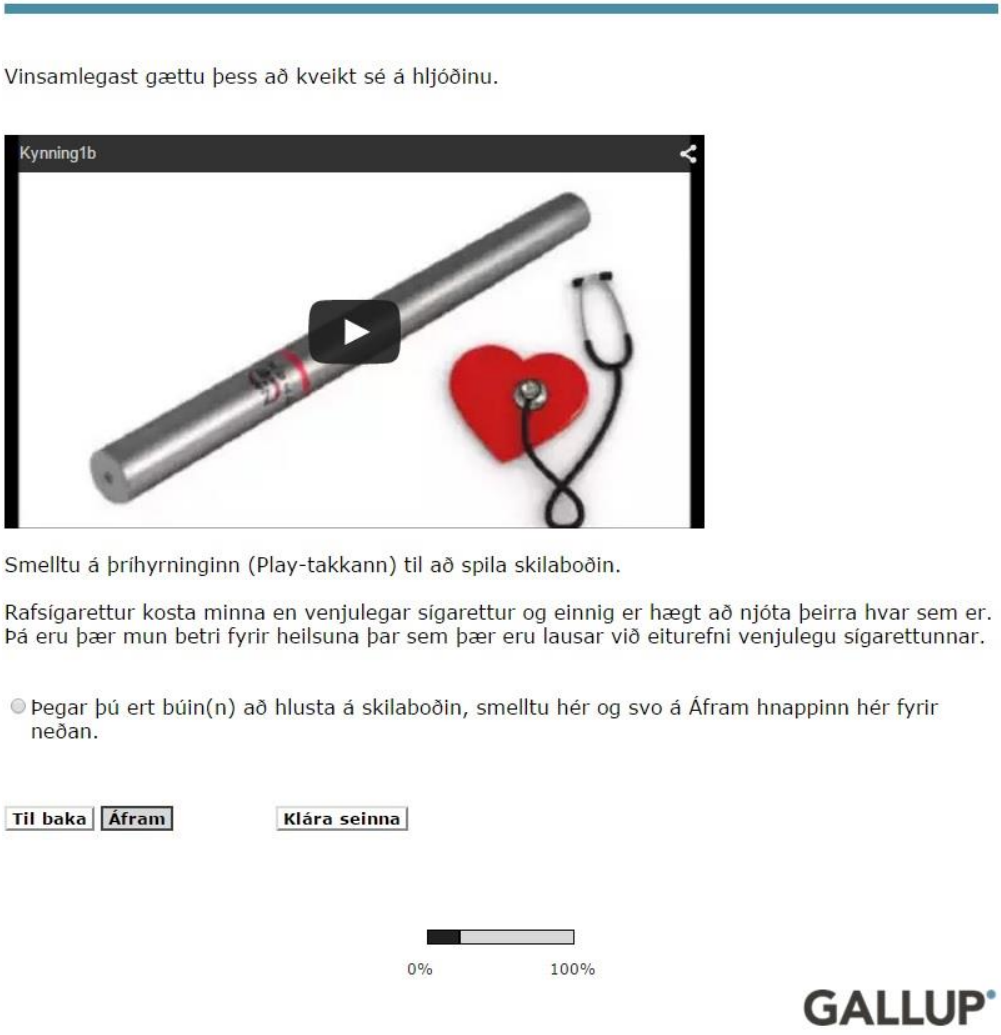

Figure 18. Online Experiment - Introduction page

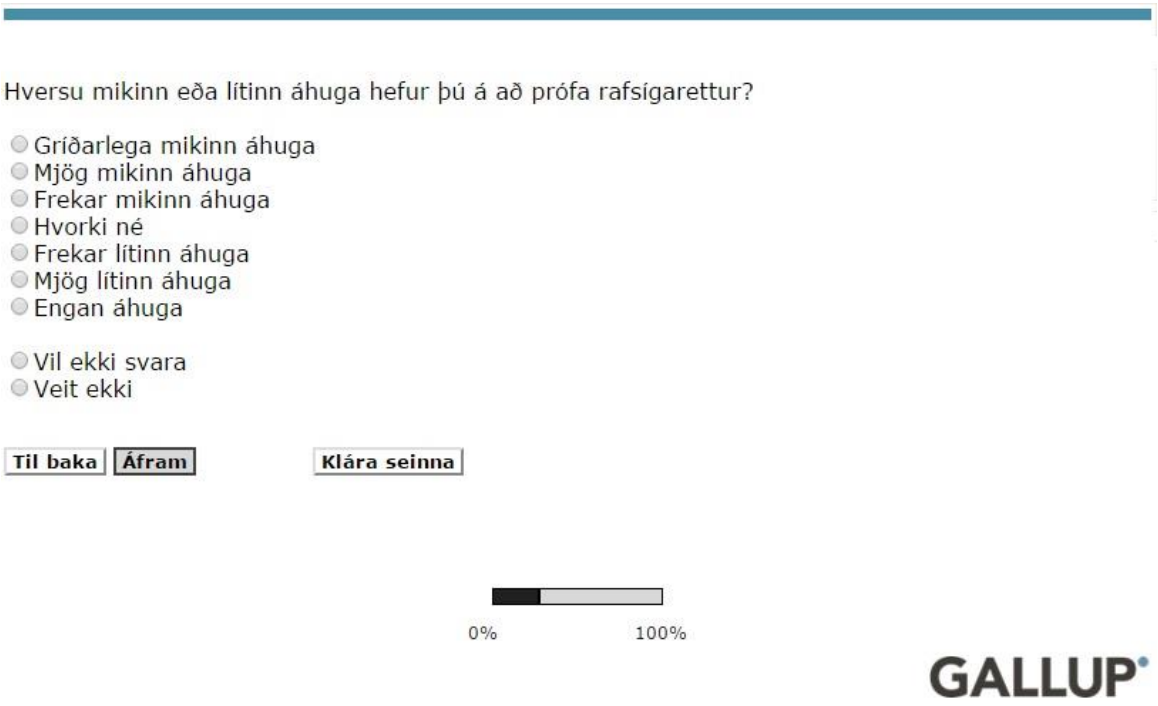

Figure 19. Online Survey - Interest in trying e-cigarettes

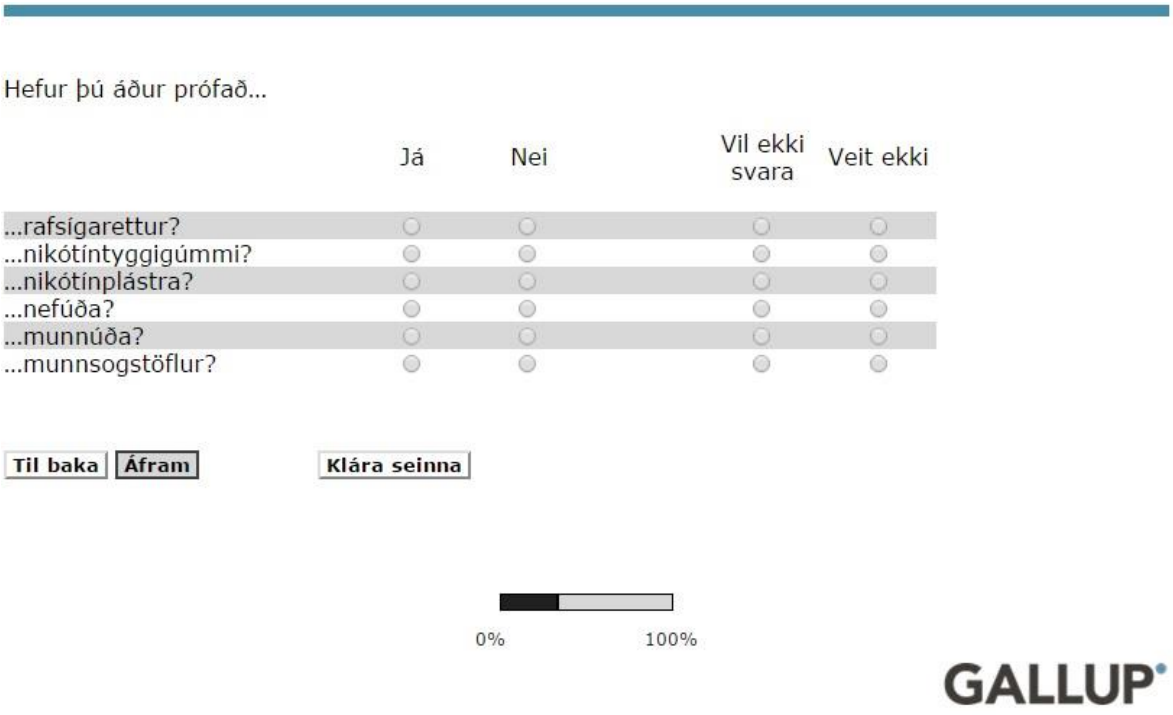

Figure 20. Online Survey - Have you tried the following?

Figure 21. Online Survey - Perceived Advantage of E-Cigarettes

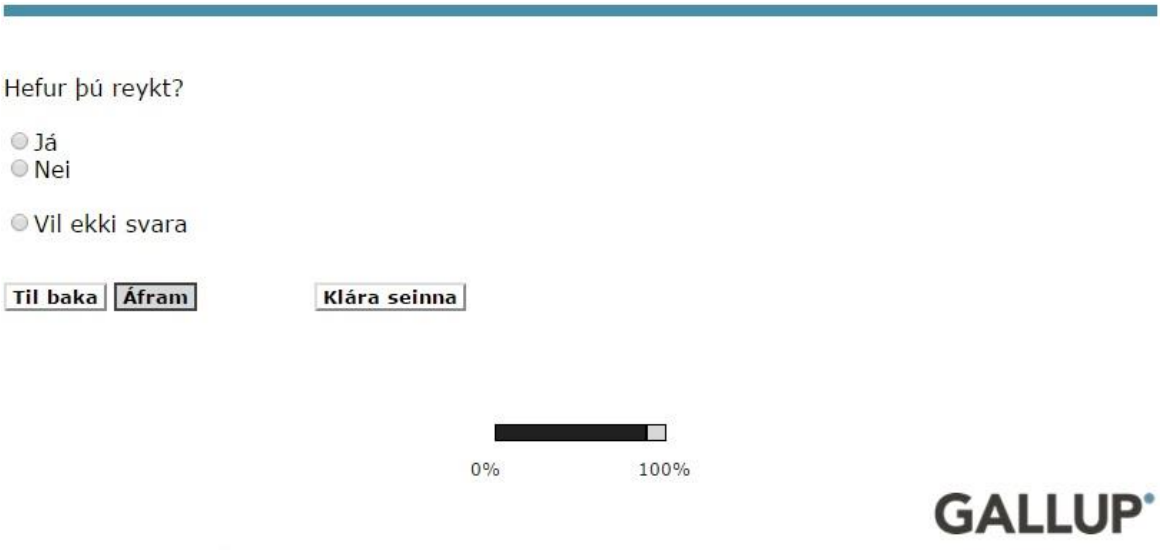

Figure 22. Online Survey - Have you smoked?

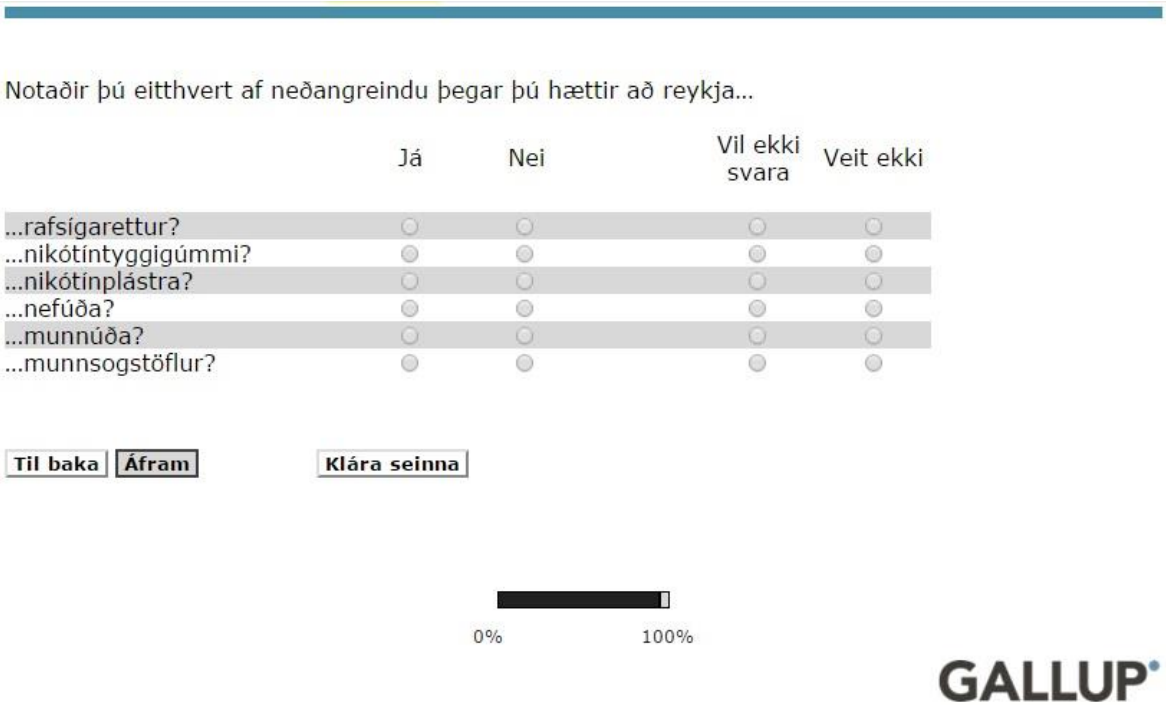

Figure 23. Online Survey - Did you use the following while quitting smoking?

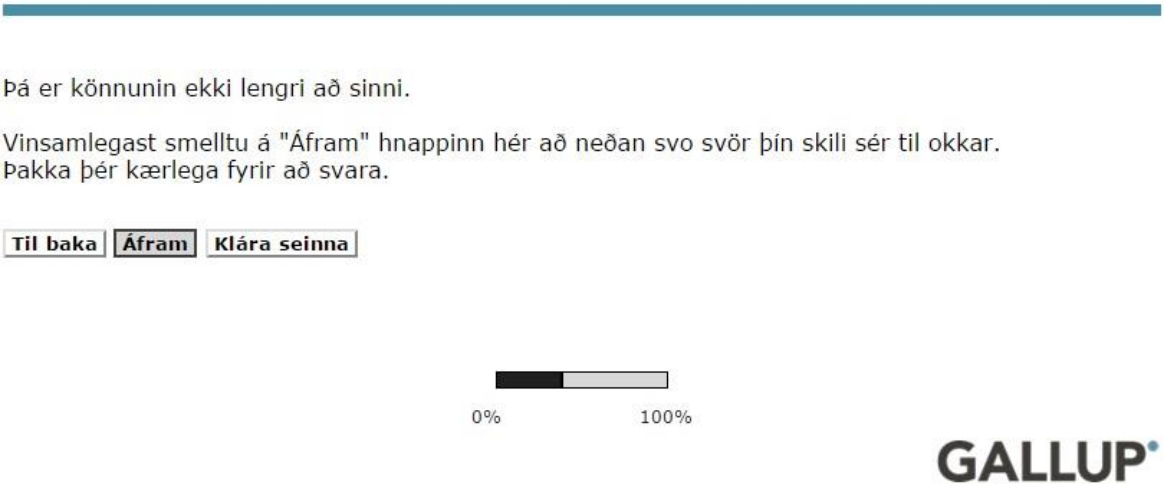

Figure 24. Online Survey - Thank you for participating

11.1. Tables and figures from SPSS

Table 3. Gender of participants

Kyn

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Karlar	415	50.5	50.5	50.5
Konur	407	49.5	49.5	100.0
Total	822	100.0	100.0	

Note: „Kyn“ is Icelandic for Gender. Karlar = Males. Konur = Females.

Table 4. Gender, Group and Smoking Habit Cross-tabulation

Hópur * Kyn * Reykir þú? Crosstabulation

Count

			Kyn		
Reykir þú?			Karlar	Konur	Total
Já	Hópur	Introduction 1 RA	88	106	194
		Introduction 2 CO	96	90	186
		Introduction 3 CG	109	103	212
	Total		293	299	592
Nei	Hópur	Introduction 1 RA	46	33	79
		Introduction 2 CO	31	37	68
		Introduction 3 CG	41	36	77
	Total		118	106	224
Vil ekki svara	Hópur	Introduction 1 RA	0	1	1
		Introduction 2 CO	2	0	2
		Introduction 3 CG	2	1	3
	Total		4	2	6

Note: „Reykir þú“ is Icelandic for „do you smoke?“. Já = Yes, Nei = No, Vil ekki svara = Do not want to answer. Kyn = Gender, Karlar = Males, Konur = Females.

Table 5. How interested are you in trying e-cigarettes?

Hversu mikinn eða lítinn áhuga hefur þú á að prófa rafsígarettur?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gríðarlega mikinn áhuga	45	5.5	7.6	7.6
	Mjög mikinn áhuga	63	7.7	10.6	18.2
	Frekar mikinn áhuga	78	9.5	13.2	31.4
	Hvorki né	116	14.1	19.6	51.0
	Frekar lítinn áhuga	64	7.8	10.8	61.8
	Mjög lítinn áhuga	42	5.1	7.1	68.9
	Engan áhuga	135	16.4	22.8	91.7
	Vil ekki svara	46	5.6	7.8	99.5
	Veit ekki	3	.4	.5	100.0
	Total	592	72.0	100.0	
Missing	System	230	28.0		
Total		822	100.0		

Note: „Gríðarlega mikinn áhuga“ is Icelandic for Vastly Interested. Mjög mikinn áhuga = Very interested; Frekar mikinn áhuga = Somewhat interested; Hvorki né = Neither; Frekar lítinn áhuga = Somewhat uninterested; Mjög lítinn áhuga = Very uninterested; Engan áhuga = Vastly Uninterested.

Table 6. Age of Participants

Aldur

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21	8	1.0	1.0	1.0
	22	5	.6	.6	1.6
	23	6	.7	.7	2.3
	24	3	.4	.4	2.7
	25	3	.4	.4	3.0
	26	5	.6	.6	3.6
	27	9	1.1	1.1	4.7
	28	9	1.1	1.1	5.8
	29	4	.5	.5	6.3
	30	9	1.1	1.1	7.4
	31	11	1.3	1.3	8.8
	32	12	1.5	1.5	10.2
	33	7	.9	.9	11.1
	34	15	1.8	1.8	12.9
	35	20	2.4	2.4	15.3
	36	17	2.1	2.1	17.4
	37	13	1.6	1.6	19.0
	38	19	2.3	2.3	21.3
	39	11	1.3	1.3	22.6
	40	16	1.9	1.9	24.6
	41	8	1.0	1.0	25.5
	42	12	1.5	1.5	27.0
	43	14	1.7	1.7	28.7
	44	10	1.2	1.2	29.9
	45	14	1.7	1.7	31.6
	46	23	2.8	2.8	34.4
	47	21	2.6	2.6	37.0
	48	18	2.2	2.2	39.2
	49	17	2.1	2.1	41.2
	50	22	2.7	2.7	43.9
	51	19	2.3	2.3	46.2
	52	29	3.5	3.5	49.8
	53	18	2.2	2.2	51.9
	54	24	2.9	2.9	54.9
	55	25	3.0	3.0	57.9
	56	29	3.5	3.5	61.4
	57	15	1.8	1.8	63.3
	58	19	2.3	2.3	65.6

59	22	2.7	2.7	68.2
60	26	3.2	3.2	71.4
61	36	4.4	4.4	75.8
62	23	2.8	2.8	78.6
63	23	2.8	2.8	81.4
64	21	2.6	2.6	83.9
65	22	2.7	2.7	86.6
66	22	2.7	2.7	89.3
67	12	1.5	1.5	90.8
68	12	1.5	1.5	92.2
69	12	1.5	1.5	93.7
70	15	1.8	1.8	95.5
71	8	1.0	1.0	96.5
72	6	.7	.7	97.2
73	4	.5	.5	97.7
74	4	.5	.5	98.2
75	2	.2	.2	98.4
76	4	.5	.5	98.9
77	5	.6	.6	99.5
78	1	.1	.1	99.6
79	1	.1	.1	99.8
81	1	.1	.1	99.9
83	1	.1	.1	100.0
Total	822	100.0	100.0	

Note: „Aldur“ is Icelandic for Age.

Table 7. Smokers' Age Groups

Hópur * Age Groups * Reykir þú? Crosstabulation

Count

Reykir þú?			Age Groups			Total
			21-46 years	47-58 years	59-83 years	
Já	Hópur	Introduction 1 RA	67	63	64	194
		Introduction 2 CO	51	62	73	186
		Introduction 3 CG	77	63	72	212
	Total		195	188	209	592
Nei	Hópur	Introduction 1 RA	27	29	23	79
		Introduction 2 CO	30	17	21	68
		Introduction 3 CG	29	21	27	77
	Total		86	67	71	224
Vil ekki svara	Hópur	Introduction 1 RA	1	0	0	1
		Introduction 2 CO	0	1	1	2
		Introduction 3 CG	1	0	2	3
	Total		2	1	3	6

Table 8. Ever use of e-cigarettes among smokers

Have you ever tried E-Cigarettes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	199	23.1	36.5	36.5
	No	346	40.1	63.5	100.0
	Total	545	63.2	100.0	
Missing	System	317	36.8		
Total		862	100.0		

Table 9. Interest in trying e-cigarettes among smokers

E-Cigarette Interest Reverse Coding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vastly Uninterested	135	15.7	24.9	24.9
	Very Uninterested	42	4.9	7.7	32.6
	Somewhat Uninterested	64	7.4	11.8	44.4
	Neither	116	13.5	21.4	65.7
	Somewhat Interested	78	9.0	14.4	80.1
	Very Interested	63	7.3	11.6	91.7
	Vastly Interested	45	5.2	8.3	100.0
	Total	543	63.0	100.0	
Missing	System	319	37.0		
Total		862	100.0		

Table 10. Perceived advantage of e-cigarettes over NRTs among smokers

Perceived Efficacy of E-Cigarettes over NRTs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Way Worse	33	3.8	9.3	9.3
	Worse	21	2.4	5.9	15.2
	A Little Worse	8	.9	2.2	17.4
	Every bit as good	99	11.5	27.8	45.2
	A Little Better	46	5.3	12.9	58.1
	Better	76	8.8	21.3	79.5
	Way Better	73	8.5	20.5	100.0
	Total	356	41.3	100.0	
Missing	System	506	58.7		
Total		862	100.0		

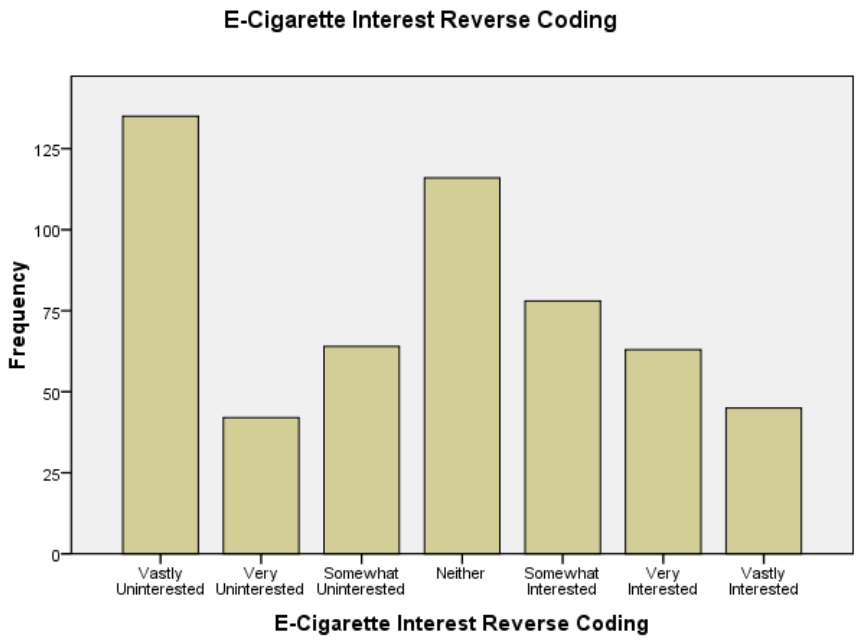

Figure 25. Interest in trying e-cigarettes among smokers

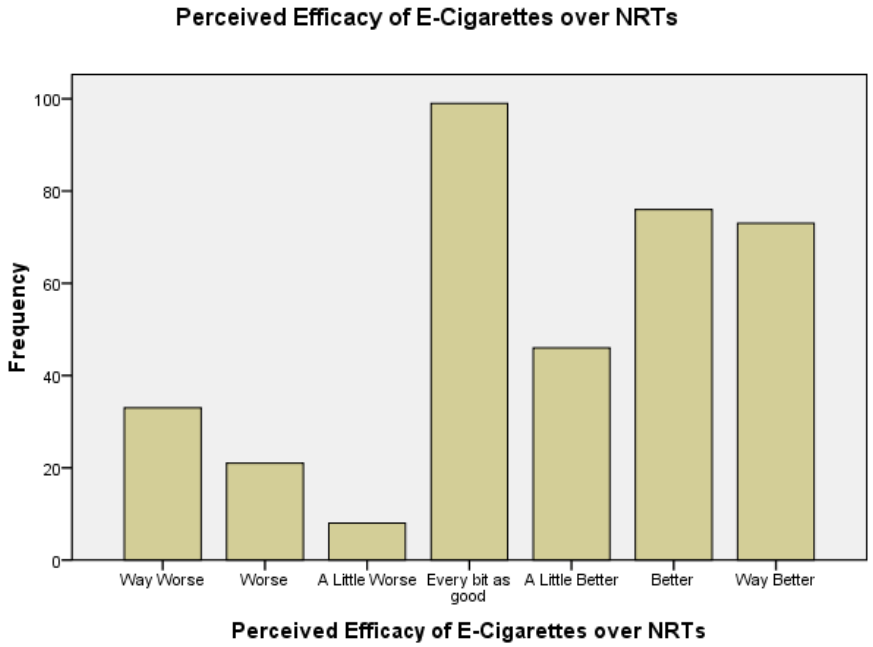

Figure 26. Perceived advantage of e-cigarettes over NRTs

Table 11. Ever use of nicotine chewing gum among smokers

Have you ever tried Nicotine Chewing Gum?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	344	39.9	63.1	63.1
	No	201	23.3	36.9	100.0
	Total	545	63.2	100.0	
Missing	System	317	36.8		
Total		862	100.0		

Table 12. Ever use of nicotine patches among smokers

Have you ever tried Nicotine Patches?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	199	23.1	36.5	36.5
	No	346	40.1	63.5	100.0
	Total	545	63.2	100.0	
Missing	System	317	36.8		
Total		862	100.0		

Table 13. Ever use of nicotine nasal spray among smokers

Have you ever tried Nicotine Nasal Spray?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	48	5.6	8.8	8.8
	No	496	57.5	91.2	100.0
	Total	544	63.1	100.0	
Missing	System	318	36.9		
Total		862	100.0		

Table 14. Ever use of nicotine inhalers among smokers

Have you ever tried Nicotine Inhaler?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	76	8.8	14.0	14.0
	No	467	54.2	86.0	100.0
	Total	543	63.0	100.0	
Missing	System	319	37.0		
Total		862	100.0		

Table 15. Ever use of nicotine lozenges among smokers

Have you ever tried Nicotine Lozenges?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	76	8.8	14.0	14.0
	No	467	54.2	86.0	100.0
	Total	543	63.0	100.0	
Missing	System	319	37.0		
Total		862	100.0		

Table 16. Use of e-cigarettes while quitting smoking

Did you use E-Cigarettes when Quitting to smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	2.7	10.8	10.8
	No	190	22.0	89.2	100.0
	Total	213	24.7	100.0	
Missing	System	649	75.3		
Total		862	100.0		

Table 17. Use of nicotine chewing gum while quitting smoking

Did you use Nicotine Chewing gum when quitting to smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	54	6.3	25.4	25.4
	No	159	18.4	74.6	100.0
	Total	213	24.7	100.0	
Missing	System	649	75.3		
Total		862	100.0		

Table 18. Use of nicotine patches while quitting smoking

Did you use Nicotine Patches when quitting to smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	1.2	4.7	4.7
	No	203	23.5	95.3	100.0
	Total	213	24.7	100.0	
Missing	System	649	75.3		
Total		862	100.0		

Table 19. Use of nicotine nasal spray while quitting smoking

Did you use Nicotine Nasal Spray when quitting to smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	.6	2.3	2.3
	No	208	24.1	97.7	100.0
	Total	213	24.7	100.0	
Missing	System	649	75.3		
Total		862	100.0		

Table 20. Use of nicotine inhalers while quitting smoking

Did you use Nicotine Inhalers when quitting to smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	1.4	5.6	5.6
	No	201	23.3	94.4	100.0
	Total	213	24.7	100.0	
Missing	System	649	75.3		
Total		862	100.0		

Table 21. Use of nicotine lozenges while quitting smoking

Did you use Nicotine Lozenges when quitting to smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	.8	3.3	3.3
	No	206	23.9	96.7	100.0
	Total	213	24.7	100.0	
Missing	System	649	75.3		
Total		862	100.0		

Table 22. Interest in trying e-cigarettes among smokers

E-Cigarette Interest Reverse Coding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vastly Uninterested	135	15.7	24.9	24.9
	Very Uninterested	42	4.9	7.7	32.6
	Somewhat Uninterested	64	7.4	11.8	44.4
	Neither	116	13.5	21.4	65.7
	Somewhat Interested	78	9.0	14.4	80.1
	Very Interested	63	7.3	11.6	91.7
	Vastly Interested	45	5.2	8.3	100.0
	Total	543	63.0	100.0	
Missing	System	319	37.0		
Total		862	100.0		

Table 23. Perceived advantage of e-cigarettes over NRTs

Perceived Efficacy of E-Cigarettes over NRTs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Way Worse	33	3.8	9.3	9.3
	Worse	21	2.4	5.9	15.2
	A Little Worse	8	.9	2.2	17.4
	Every bit as good	99	11.5	27.8	45.2
	A Little Better	46	5.3	12.9	58.1
	Better	76	8.8	21.3	79.5
	Way Better	73	8.5	20.5	100.0
	Total	356	41.3	100.0	
Missing	System	506	58.7		
Total		862	100.0		

Table 24. Descriptive means of introduction groups on e-cigarette interest

Descriptives

E-Cigarette Interest Reverse Coding

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Introduction 1 RA	175	3.83	2.033	.154	3.53	4.13	1	7
Introduction 2 CO	170	3.40	1.962	.151	3.10	3.70	1	7
Introduction 3 CG	198	3.59	1.901	.135	3.32	3.85	1	7
Total	543	3.61	1.967	.084	3.44	3.77	1	7

Table 25. Levene's test of homogeneity between introduction groups

Test of Homogeneity of Variances

E-Cigarette Interest Reverse Coding

Levene Statistic	df1	df2	Sig.
.602	2	540	.548

Table 26. Analysis of variance between introduction groups on e-cigarette interest

ANOVA

E-Cigarette Interest Reverse Coding

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.964	2	7.982	2.071	.127
Within Groups	2081.698	540	3.855		
Total	2097.661	542			

Table 27. Descriptive means of age groups on e-cigarette interest

Descriptives

E-Cigarette Interest Reverse Coding

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
21-46 years	177	4.02	2.007	.151	3.72	4.31	1	7
47-58 years	174	3.64	1.923	.146	3.36	3.93	1	7
59-83 years	192	3.19	1.895	.137	2.92	3.46	1	7
Total	543	3.61	1.967	.084	3.44	3.77	1	7

Table 28. Levene's test of homogeneity between age groups

Test of Homogeneity of Variances

E-Cigarette Interest Reverse Coding

Levene Statistic	df1	df2	Sig.
.043	2	540	.958

Table 29. Analysis of variance between age groups on e-cigarette interest

ANOVA

E-Cigarette Interest Reverse Coding

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	62.934	2	31.467	8.351	.000
Within Groups	2034.727	540	3.768		
Total	2097.661	542			

Table 30. Post hoc tests between age groups on e-cigarette interest

Multiple Comparisons

Dependent Variable:E-Cigarette Interest Reverse Coding

	(I) Age Groups	(J) Age Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	21-46 years	47-58 years	.373	.207	.170	-.11	.86
		59-83 years	.824*	.202	.000	.35	1.30
	47-58 years	21-46 years	-.373	.207	.170	-.86	.11
		59-83 years	.451	.203	.069	-.03	.93
	59-83 years	21-46 years	-.824*	.202	.000	-1.30	-.35
		47-58 years	-.451	.203	.069	-.93	.03
Games-Howell	21-46 years	47-58 years	.373	.210	.178	-.12	.87
		59-83 years	.824*	.204	.000	.35	1.30
	47-58 years	21-46 years	-.373	.210	.178	-.87	.12
		59-83 years	.451	.200	.064	-.02	.92
	59-83 years	21-46 years	-.824*	.204	.000	-1.30	-.35
		47-58 years	-.451	.200	.064	-.92	.02
Dunnett t (>control)[a]	21-46 years	59-83 years	.824*	.202	.000	.44	
	47-58 years	59-83 years	.451*	.203	.025	.06	

*. The mean difference is significant at the 0.05 level.

a. Dunnett t-tests treat one group as a control, and compare all other groups against it.

Table 31. Descriptive means of e-cigarette advantage between age groups

Descriptives

Perceived Efficacy of E-Cigarettes over NRTs

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
21-46 years	140	4.86	1.619	.137	4.59	5.13	1	7
47-58 years	115	4.98	1.896	.177	4.63	5.33	1	7
59-83 years	101	4.34	1.986	.198	3.94	4.73	1	7
Total	356	4.75	1.834	.097	4.56	4.94	1	7

Table 32. Analysis of variance between age groups on e-cigarette advantage

ANOVA

Perceived Efficacy of E-Cigarettes over NRTs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.306	2	12.653	3.821	.023
Within Groups	1168.941	353	3.311		
Total	1194.247	355			

Table 33. Post hoc tests between age groups on e-cigarette advantage

Multiple Comparisons

Dependent Variable:Perceived Efficacy of E-Cigarettes over NRTs

	(I) Age Groups	(J) Age Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	21-46 years	47-58 years	-.118	.229	.863	-.66	.42
		59-83 years	.528	.238	.069	-.03	1.09
	47-58 years	21-46 years	.118	.229	.863	-.42	.66
		59-83 years	.646*	.248	.026	.06	1.23
	59-83 years	21-46 years	-.528	.238	.069	-1.09	.03
		47-58 years	-.646*	.248	.026	-1.23	-.06
Games-Howell	21-46 years	47-58 years	-.118	.224	.857	-.65	.41
		59-83 years	.528	.240	.075	-.04	1.10
	47-58 years	21-46 years	.118	.224	.857	-.41	.65
		59-83 years	.646*	.265	.041	.02	1.27
	59-83 years	21-46 years	-.528	.240	.075	-1.10	.04
		47-58 years	-.646*	.265	.041	-1.27	-.02
Dunnett t (>control)[a]	21-46 years	59-83 years	.528*	.238	.025	.07	
	47-58 years	59-83 years	.646*	.248	.009	.17	

*. The mean difference is significant at the 0.05 level.

a. Dunnett t-tests treat one group as a control, and compare all other groups against it.

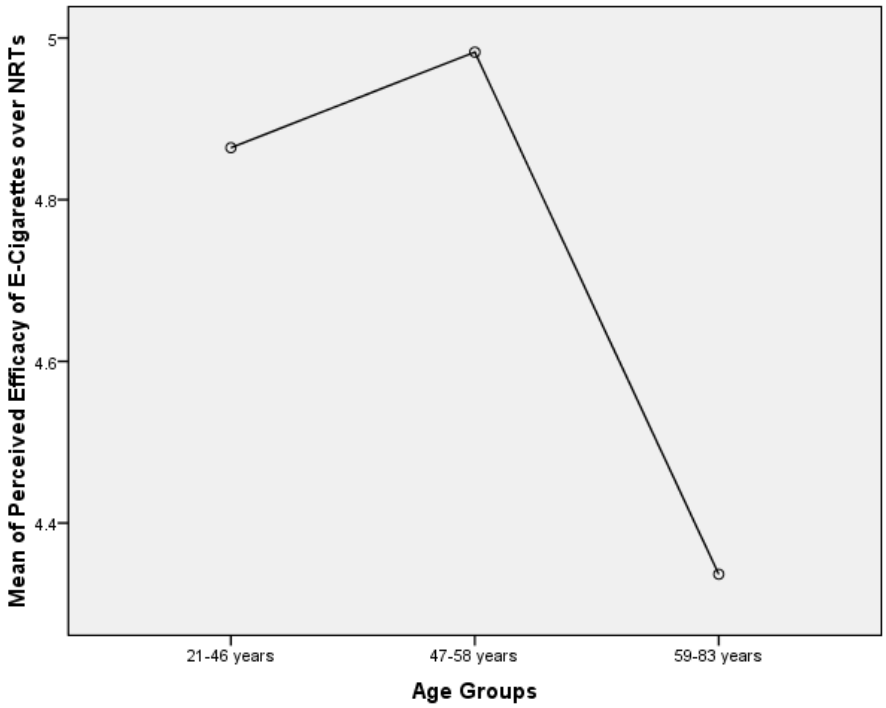

Figure 27. Difference between age groups on e-cigarette perceived advantage over NRTs

Table 34. Introduction groups and gender between subjects factors

Between-Subjects Factors

		Value Label	N
Hópur	1	Introduction 1 RA	175
	2	Introduction 2 CO	170
	3	Introduction 3 CG	198
Kyn	1	Karlar	270
	2	Konur	273

Table 35. Descriptive means of the interaction between introduction groups and gender on e-cigarette interest

Descriptive Statistics

Dependent Variable:E-Cigarette Interest Reverse Coding

Hópur	Kyn	Mean	Std. Deviation	N
Introduction 1 RA	Karlar	3.38	2.015	79
	Konur	4.20	1.982	96
	Total	3.83	2.033	175
Introduction 2 CO	Karlar	3.10	1.971	88
	Konur	3.72	1.913	82
	Total	3.40	1.962	170
Introduction 3 CG	Karlar	3.39	1.976	103
	Konur	3.80	1.802	95
	Total	3.59	1.901	198
Total	Karlar	3.29	1.983	270
	Konur	3.92	1.905	273
	Total	3.61	1.967	543

Table 36. Interaction effect between introduction groups and gender on e-cigarette interest

Tests of Between-Subjects Effects

Dependent Variable:E-Cigarette Interest Reverse Coding

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	69.520[a]	5	13.904	3.681	.003
Intercept	6969.374	1	6969.374	1845.312	.000
IntroGroup	12.259	2	6.130	1.623	.198
Gender	51.020	1	51.020	13.509	.000
IntroGroup * Gender	3.823	2	1.911	.506	.603
Error	2028.142	537	3.777		
Total	9158.000	543			
Corrected Total	2097.661	542			

a. R Squared = .033 (Adjusted R Squared = .024)

Table 37. Interaction effect of introduction groups and gender on e-cigarette advantage

Tests of Between-Subjects Effects

Dependent Variable:Perceived Efficacy of E-Cigarettes over NRTs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	18.705[a]	5	3.741	1.114	.353
Intercept	7905.929	1	7905.929	2353.871	.000
IntroGroup	12.507	2	6.254	1.862	.157
Gender	4.183	1	4.183	1.246	.265
IntroGroup * Gender	.143	2	.072	.021	.979
Error	1175.542	350	3.359		
Total	9236.000	356			
Corrected Total	1194.247	355			

a. R Squared = .016 (Adjusted R Squared = .002)

Table 38. Introduction groups and e-cigarette ever use between-subjects factors

Between-Subjects Factors

		Value Label	N
Hópur	1	Introduction 1 RA	115
	2	Introduction 2 CO	109
	3	Introduction 3 CG	132
Have you ever tried E-Cigarettes?	1	Yes	172
	2	No	184

Table 39. Means of e-cigarette ever use within introduction groups on e-cigarette advantage

Descriptive Statistics

Dependent Variable:Perceived Efficacy of E-Cigarettes over NRTs

Hópur	Have you ever tried E-Cigarettes?	Mean	Std. Deviation	N
Introduction 1 RA	Yes	5.50	1.513	60
	No	4.53	1.794	55
	Total	5.03	1.716	115
Introduction 2 CO	Yes	5.17	1.917	48
	No	4.31	1.858	61
	Total	4.69	1.923	109
Introduction 3 CG	Yes	5.06	1.612	64
	No	4.09	1.930	68
	Total	4.56	1.842	132
Total	Yes	5.24	1.671	172
	No	4.29	1.864	184
	Total	4.75	1.834	356

Table 40. Interaction effect of introduction groups and e-cigarette ever use on their advantage

Tests of Between-Subjects Effects

Dependent Variable:Perceived Efficacy of E-Cigarettes over NRTs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	92.569[a]	5	18.514	5.882	.000
Intercept	8018.805	1	8018.805	2547.551	.000
IntroGroup	11.909	2	5.954	1.892	.152
TriedEcigRECODED	76.677	1	76.677	24.360	.000
IntroGroup * TriedEcigRECODED	.262	2	.131	.042	.959
Error	1101.678	350	3.148		
Total	9236.000	356			
Corrected Total	1194.247	355			

a. R Squared = .078 (Adjusted R Squared = .064)