Algorithms told me to buy it

To what extent do Amazon's recommendations influence the choice of its customers?

Student Name: Mihael Gelo
Student Number: 512149

Supervisor: João Gonçalves, MSc.

Master Media Studies. Media & Creative Industries
Erasmus School of History, Culture and Communication
Erasmus University Rotterdam, The Netherlands

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1. Introduction

E-commerce is becoming a booming form of retail business in the 21st century and is expected to further grow in the upcoming decade. According to the statistical data, the global e-commerce retail sales are marking continuous annual rise, the revenue of which being at $1.3 trillion (US dollars) in 2014. climbed up to $2.3 trillion in 2017. Furthermore, it is projected that this sum will reach annual revenue of $4.9 trillion in the year of 2021 (Statista, 2019). While the current trend captured by the data in this report is that *business to business* e-retail accounts for more sales than *business to consumer* e-retail, ordering products online and getting them delivered to their homes is arguably a luxury to which people are getting adjusted and are actively incorporating this routine into their daily lives. Based on the stated financial projections, this trend of online purchase of products and services by consumers will soon only increase in scope, creating a new society of buyers in which online shopping will be the new normal for all sorts of purchases.

Regarding this new society, there is an important issue to be addressed, the one concerning certain new influences on the choices of the consumers when shopping on the online platforms. In the e-retail environment, just like during the physical shopping that occurs in the retail stores, consumers' choice among many possible brands in the given category of products is affected by the previous influences such as friends' advice, online reviews, value of products, marketing communication, media and others. However, in the e-retail platforms, there is an additional influence on the choice of the consumer– algorithmic recommendations on the platform. The recommender systems of e-retail platforms are put in place to gather the data from the users, with the aim of precise algorithmic predictions regarding what these users may like in products and subsequent targeting of users with the recommendations of these products (Lü et al., 2012, p. 2).

With the growth of the e-retail in the following years and the focus of the major platforms on big data management, the importance should be given to these recommender systems and to the role that they play as the influencers of choice. Measuring the influence that they have on the consumers' decisions should enable the scientific community to understand current trends regarding the (lack of) critical assessment of these systems by the consumers. If the influence is high and the consumers indeed significantly rely on recommendations, this may open the door for

the discussion about the implications regarding the diversity of choice and the possibilities of brands' influence on the e-retail stores in order to manipulate the results.

Previous research, as it will be discussed later on, has already put some focus on the recommender systems and how people react to them (Adomavicius, Bockstedt, Curley and Zang, 2017; Logg, Minson and Moore, 2019; Senecal & Nantel, 2004), but no exploration which would focus specifically on a major significant e-retail platform was performed. Therefore, it is the aim of this thesis to explore the given and produce findings that will contribute to the scientific research and potentially open some new research paths. Following this discussion, Amazon was chosen as a suitable object of exploration. According to the statistical data, this e-commerce giant is the world's most valuable brand with the estimated value of $188 billion (Statista, 2019) and is projected to account for 50 percent of the entire US e-commerce retail market by 2021 (Statista, 2019). Amazon is therefore a significant e-retail platform that deserves to be an object of the upcoming exploration.

The above presented arguments lead to the following research question of this thesis to emerge:

To what extent do recommender systems influence the purchase choice of Amazon's customers?

Furthermore, to narrow this question, two aspects of the influence process are identified as important to explore. First, to measure the significance of Amazon's recommendations, their influence can be compared with other significant influences that affect Amazon's customers' purchase choice. Secondly, to delve deeper into the dynamics of the influencing process, it is important to introduce the phenomenon of persuasion into the research. In that sense, the significance of Amazon's recommendations influence can be evaluated by exploring whether those users who are more skeptical when confronted with recommendations and who understand Amazon's persuasion attempts will still significantly follow Amazon's recommendations while purchasing. The two sub questions for this research are therefore the following:

1. *How do Amazon's recommendations as an influence compare with other influences in affecting the purchase decisions of Amazon's customers?*
2. *To what extent Amazon's recommendations' influence differ depending on the users' persuasion knowledge and their degree of the elaboration of recommendations?*

2. Theoretical framework

In order to conceptualize influences and persuasion to answer the stated sub-questions of the research, the theoretical framework with the concepts addressing these phenomena needed to be found and incorporated in this research, serving as a backbone for the upcoming exploration. Before presenting these, however, the following chapter serves for brief presentation of recommender systems, the aim of it being the exploration of the logic behind their operating process.

2.1 Recommender systems

At the time of the writing of this thesis, Amazon was using the recommender system based on the item-based (also called *item-to-item*) collaborative filtering. While the special emphasis of this chapter will be put on this technique since it is the one that interests this research the most, it is nevertheless important to start by introducing the recommender systems and their operating logic in general.

Recommender systems are used by the online platforms to predict user's future likes and interests regarding the products and services based on the currently available data about users and their preferences (Lü et al., 2012, p. 2). Being mostly applied to e-commerce web sites, these systems are useful in tackling the issue of information overload, which may prove overwhelming for users of the certain website (Symeonidis, Ntempos & Manolopoulos, 2014, p. 7) as they have too many options to choose from. As explained by Symeonidis et al. (2014, p. 7), when generally faced with some problem, a person often relies on suggestions of those who have more experience regarding the given issue. In the case of an online environment, however, there are numerous possible suggestions which make it rather difficult for user to assess trustworthy ones from those that aren't. Therefore, the recommendation process in the online environment can be shifted from individual suggestions to collective logic, which is what recommendation algorithms do. As explained by Aggarwal, Tomar and Kathuria (2017, p. 65), these systems are beneficial to service providers, as well as to the users. On one hand, they reduce users' costs of transactions regarding the process of finding and selecting the items during the online shopping. On the other, they serve

to service providers as tool for selling more products and increasing the e-commerce revenue as they influence and improve the decision-making process of users.

There are two main techniques for generation of recommendations that the platforms use - content-based filtering and collaborative filtering.

2.1.1 Content-based and Collaborative filtering

In the content-based filtering, the recommendation of some item to the user is based on those content characteristics gathered from the items (such as products or media content) that were previously evaluated by that user. Namely, those items that are mostly related to the user's previously positively evaluated items are then recommended to that user (Isinkaye, Folajimi & Ojokoh, 2015, p. 264). To determine these positively evaluated items, the systems rely on the marked preferences which are voluntarily entered by user during sign-up into the given platform or they simply observe user's choice of items (Kembellec, Chartron & Saleh, 2014, p. 7).

While this technique uses similarity of content to produce recommendation, the next major technique- collaborative filtering, uses similarity of user profiles on the given platform to predict the content that could be most interesting to each user. The operating logic of collaborative filtering is therefore that "people who agreed in their evaluation of certain items in the past are likely to agree again in the future" (Aggarwal et al., 2017, p. 66). Furthermore, collaborative filtering is divided into two sub-techniques of filtering, the first one being the user-based collaborative filtering in which artificial intelligence groups user profiles on the platform based on the common items that they have positively evaluated in the past. Algorithms then look observe this newly formed group and look at other items that every individual in the group had previously positively evaluated. Algorithms than take all these items from profiles of individual users and send them as recommendations to the other users from the group who didn't interact with them yet. (Aggarwal et al., 2017).

Amazon, however, uses the second major collaborative technique- item-based filtering, which will be explained in the separate sub-chapter, as follows.

2.1.2 Amazon's technique- the item-based collaborative filtering

The item-based filtering technique was invented by Amazon.com in 1998 as a new method of collaborative filtering and as a replacement for the user-based technique (United States Patent,

1998). This new Amazon's technique proved to be rather influential, being adopted by the significant tech companies such as media giants Netflix and YouTube in the years following its introduction (Smith & Linden, 2017, p. 13). The incentive for creation of the item-based technique was due to the flaws of the user-based technique regarding their lack of sparsity and scalability. As explained by Sarwar, Karypis, Konstan and Riedl (2001, p. 287), many commercial platforms want recommender systems to evaluate larger sets of items (such as containing books or movies) where even the most active users realistically purchase less than 1% of the entire store's offer. In such settings, the previously explained user-based collaborative filtering may produce poor recommendations to the users, since the quantitative imbalance of offered and purchased (positively evaluated) content on the platform may result in inadequate groupings of user profiles. In addition to this argument, another issue with the user-based approach concerns the inability of its algorithm's computing to cope with the potential increase in number of both the users and the items on the given platform.

Therefore, instead of matching similar user profiles like user-based collaborative filtering would do, the item-based collaborative filtering matches positively evaluated user's items with similar items that are available on the platform. These similar items are then combined into lists which are sent as recommendations to each user. But unlike the content-based filtering which focuses only on previously evaluated content to produce similarity, the similarity between the two items in the item-based filtering is calculated by special formulas in which algorithms measure similarity index when they observe that some items are often being purchased together (Linden, Smith & York, 2003, p. 78). For instance, the person who orders a toothbrush on Amazon may get the recommendations for products such as toothpaste as algorithms measured the high similarity between these items due to the fact that many users purchased them together.

Now that the function of these algorithms is clearer, hopefully it is easier to deconstruct the meaning of their influence on the Amazon's buyers and to understand how these recommendations are set to influence the users by entering their consideration process. However, rather than being alone in this cognitive consideration set, they compete with other influences to remain there all the way until the purchase decision.

2.2 Decision-making process

While buying a certain product, there are many elements that may affect the final decision of a consumer regarding which brand it will choose. In this section, the aim is to specify these influences and categorize them logically, so that the clear structure of the influences can emerge and that it becomes feasible to identify what kind of proportion of this set is influenced by Amazon's recommender systems.

But before identifying these influences on the consumers, the theoretical concept of consideration set should be explained as it decreases the level of abstraction regarding what is it that leads to the consumer's choice.

2.2.1 Consideration set

Every purchase on Amazon is preceded by a certain psychological journey, characteristics of which vary from user to user. Before making a purchase, some users may want to make an extensive research regarding the brand and the product, while others may behave more impulsively. Some may be influenced by their family or peers when choosing a brand, why others may focus predominantly on price and quality aspects. There are even users who may come to the website not being prepared to buy a certain product, but then shifting their focus from the ones that they were originally planned to buy.

All these variables and their combinations shape person's consideration set - the cognitive frame in which external information and influences form a consumer's opinion or lead to an impulse, either of which finally culminates as a purchase decision (Shocker, Ben-Akiva, Boccara & Nedungadi, 1991; Brown & Wildt, 1992).

In the model of individual choice (Shocker et al., 1991, p. 182) suggest that the formation of the consideration set is one of the natural steps in the consumer's cognitive process of filtering all the possible information about purchase alternatives. In this sense, consideration set is the result of the narrowing of what is first the universal set (all possible options of purchase that individual could possibly encounter) and then the awareness set (all items that the person is aware of, whether they are stored in the long-term memory or are introduced immediately before the purchase). Based on this insight, it can therefore be concluded that the origins of items in person's awareness set may range from the brand advertisements seen years ago and stored deep in the memory to the

recommendations of Amazon.com seen less than a minute prior to the purchase. As pointed in the model, the awareness set evolves into a consideration set and it happens under the process of a purposeful construction. This means that the individual may have knowledge about many alternatives but uses only those which come to mind as relevant for a certain purpose such as acquiring a new product. The core characteristic of consideration set is that it is a dynamic place, meaning that here the person evaluates, adds and deletes purchasing options within working memory, eventually guiding itself up to the final decision. This very dynamic is the reason why the authors of the model also add the choice set as the one last funnel between the consideration set and final purchase decision: it is stated that the choice set is the extension of consideration set which consists of the smaller number of highly differentiated alternatives (Shocker et al., 1991, p. 183). However, authors note that the choice set can be observed as an inclusive part of the consideration set and that ultimately it is not necessary to separate the two.

Due to its sophisticated explanation of the decision-making process using concepts of universal set, awareness set and consideration set, the depicted model of individual choice was presented here so extensively. As for its acceptance within the scientific community, many authors have studied it and referred to it (Brown & Wildt, 1992; Eliaz & Spiegler, 2011; Hauser, 2014; Roberts and Lattin, 1991; Vroomen, Franses & Nierop, 2004) using it either as template for research or building additional theory on it or both. One additional explanation of consideration set is that it consists of brands that the consumer is willing to buy or would consider buying, considers them acceptable to purchase or did so the last time it was purchasing a product, or if it actually more actively considered to buy them the last time it was purchasing a product (Brown & Wildt, 1992, p. 238).

As for the expansion of the theoretical concept of consideration set, Roberts and Lattin (1991) most notably contributed with their model of criteria for brand's entry into the consideration set of a consumer. Using mathematical backbone, they explained that the entry of the brand into the consideration set is a result of a trade-off between perceived brand's utility and the mental storage and processing costs of the consumer. Essentially, they suggest, consideration is a consumer's cost-benefit evaluation. The benefit here is expressed in the maximum expected utility regarding the choice from the set, while the cost is determined by total cost of maintaining the consideration set, including the consumer's cost of search as well as the cost of mental processing and storage (Roberts & Lattin, 1991, p 431). Another notable model that uses consideration set as the

theoretical backbone is the model of consumer behavior where the consideration set is described as the result of both deliberate and unconscious screening process, used by consumers to reduce quantity of relevant alternatives (Eliaz & Spiegel, 2011, p.235). This last model is of particular use as it transcends static explanations of consideration set, introducing the marketing variable and examining the influence process, where marketers attempt to exploit the unconscious aspects of consumer's consideration set. As such, the model serves as adequate theoretical bridge between the phenomenon of decision-making and the phenomenon of persuasion. It will be further assessed in the *Persuasion* chapter of this thesis.

Hopefully, the argumentation and theoretical framework presented above proved successful in decreasing the level of abstraction as to what is meant by consumer's choice. Now it should become clearer that by assessing *To what extent Amazon's recommender systems influence the choice of its customers*, what is being observed is the significance of these recommendations' impact on consideration set and how they compare to the other influences in this set.

2.2.2 Influences

Other than the recommendations on the website, the influences on the consideration set of Amazon's users are seemingly countless as there are many variables that can affect the customers and lead them to the purchase decision. However, by delving into existing theories and findings from previous research, it is the aim of this subchapter to identify and frame certain notable categories of influences and label them. This way, by establishing legitimate influences they can be used in this research as comparators with the influence of Amazon's recommendations.

Naturally, the first influence category that was established for this research is *Amazon's recommendations*. Previous research already indicates that the online buyers put high amount of trust and follow recommendations when faced with the purchase decision. For instance, in the research of Senecal and Nantel (2004) performed on the online shoppers, it was established that "the recommender system was found to be the most influential recommendation source even if it was perceived as possessing less expertise than human experts and as being less trustworthy than other consumers" (Senecal & Nantel, 2004, p. 167). Recently, Logg, Minson and Moore (2019) came to the similar conclusion, further stressing about the trend of algorithmic appreciation and people's trust in recommender systems in the second decade of the 21st century. Furthermore, the experimental research performed by Adomavicius, Bockstedt, Curley and Zang (2017) on

economic behavior of online consumers when purchasing songs also concluded about the importance of this influence. It showed that recommender systems positively affect the consumers' willingness to pay for the product, further demonstrating in experiment that this effect existed even when the recommendations contained significant errors.

Second category of influence that will be used in this research was labeled *Word of mouth*. This category includes both impact of offline word-of-mouth and electronic word-of-mouth on purchase decision, meaning that it encompasses influences such as friends, as well as online critics' and costumers' reviews. It has been established so far that online customers tend to rely on other people's comments and opinions before making a decision, finding them a valuable source of information during the decision-making process (Ahmad, Vveinhardt & Ahmed, 2014, p. 402; Katawetawaraks & Wang, 2011; Lackermair, Kailer & Kanmaz, 2013). Furthermore, Shang, Pei and Jin (2017) found that the decision-making process can be influenced by social risk factor, meaning that the products or brands that are likely to cause disapproval from family and friends may inhibit purchase decision of the consumers.

Third relevant influence category for this research was labeled *Marketing communication*. Since global spending on advertising is constantly on the rise and is projected to account for $563.02 billion in 2019 (Statista, 2019), it is reasonable to expect that such significant expenditure is backed by empirical evidence of advertising's impact on consumer choice. Indeed, it is established that ads and branding strategies have impact on consumer's preference of brands in sectors such as luxury goods (Shukla, 2010), food industry (Ayanwale, Alimi & Ayanbimipe, 2005), telecommunications (Abideen & Saleem, 2011) and regarding health products (Pechmann & Catlin, 2016) as well as in general – backed by the more comprehensive research on advertising (Haider & Shakib, 2018; Kumar & Raju, 2013).

Finally, fourth established category of influence for this research was labeled *Perceived value*. This influence can also be described as price-quality ratio of the product or brand, meaning that the consumers assess what quality they get for the price that they pay. Previous research has showed that as the price of the product increases, the purchase decisions will generally decrease, but perceived quality of the product and brand may, nevertheless, compensate for the high price and result in the purchase decision (Albari & Safitri, 2018; Awan & Fatima, 2014; Beneke, Flynn, Greig & Mukaiwa, 2013).

Following the argumentation from within this chapter, four categories of influences on consumer's consideration set are established and will be further used in the operationalization of the thesis. These are:

1. *Amazon's recommendations* (personalized recommendations on Amazon.com)
2. *Word of mouth* (friends' opinion, critics' reviews, consumers' reviews)
3. *Marketing communication* (advertising and branding messages)
4. *Perceived value* (price-quality ratio)

2.3 Persuasion

Previously explained consideration set can be observed as a cognitive bubble that appears when the consumer initiates the decision-making process and is making a purchase choice. As this bubble appears, multiple experiences and messages that the consumer is experiencing at the given moment or have experienced in the past are activated in its brain and will eventually lead them to the purchase decision. These pieces of information are sent by multiple influences, the important of which were identified in the previous chapter.

However, in order to go further and assess the dynamic of the relationship between Amazon as a marketer and its user as a consumer, this chapters' aim is to explain the concept of persuasion. In the already mentioned model of consumer behavior (Eliaz & Spiegler, 2011), it is argued that the role of marketing is to overcome the consumer's resistance to new alternatives which result from the fact that the consumer will not perceive every available option as a relevant one for its consumption need. To overcome this problem (and enter the consideration set), marketers initiate persuasion attempts.

The goal of this chapter is to assess this persuasion as a certain phenomenon that occurs between the agent and the target. Since both these actors play an active role in the process of persuasion- agent as the one who initiates persuasion and target as the one who copes with persuasion, both of their actions have effect on the persuasion outcome. The two models that will be used to explain this are Elaboration likelihood model and Persuasion knowledge model.

2.3.1 Elaboration likelihood model

Elaboration likelihood model (ELM) created by Petty and Cacioppo (1986) seeks to explain the process of person's elaboration of information when they receive persuasive messages, focusing on how likely it is that the person will engage in active thinking about the message. The model does so by arguing about the existence of two possible cognitive routes through which this processing can occur (Tam & Ho, 2005, p. 274) – the central and the peripheral route, the engagement of which is determined by consumers' motivation and ability (Petty and Cacioppo, 1986, p. 129).

In this sense, motivation can be explained as the result of the amount of the involvement of consumer when they are being stimulated by a certain marketing message. High involvement occurs when the recipient is aroused by the information, strategy-limited low involvement is what happens when the recipient pays attention to non-brand advertising such as music, and attention-limited low involvement presumes lack of attention regarding the communicated message (Andrews, 1988, p.219). Therefore, low involvement is manifested in low motivation, and vice versa. The ability, second determinant of processing route can be explained as set of person's knowledge and past experiences regarding the communicated issue. If the person has in its past engaged considerably in thinking about the issue and already possesses major cognitive structure of preexisting information, this will certainly be useful for evaluation of new information, and should lead to high ability to elaborate the message (Petty & Cacioppo, 1981, p. 853).

Given all the stated, the persuasion process goes as follows: the central route of information processing is engaged if the message recipient has the high motivation and the ability to critically assess the received message and make more mindful effort to scrutinize all information relevant to the message. On the other hand, the recipients will engage in peripheral processing if they lack motivation or ability to process the detailed information, as they will rather rely on simple cues and make inferences based on the rule of the thumb (Petty & Cacioppo, 1986; Tam & Ho, 2005). Consequently, while the central route processing leads to formation of stronger, less volatile attitudes, those attitudes that are produced under the peripheral route aren't as accessible, persistent and resistant, nor can predict the behavior as successfully (Morris, Woo & Singh, 2005, p. 84). In each case, whichever variable (influencer) initiates a persuasion attempt on the consumer, it will result in one of the following three: the variable will serve to the consumer either as a persuasive

argument, as a peripheral cue, or it will lead to the questioning of the argument (Petty & Cacioppo, 1986, p. 192).

Despite getting some criticism such as for not emphasizing consumer's emotions but rather focusing solely on cognitive aspects (Morris, Woo & Singh, 2005, p. 84) as well as for not establishing more clearly the determinants of processing routes (Andrews, 1988), Elaboration likelihood model is possibly the most significant piece of theory regarding the phenomenon of persuasion. The model was used as a backbone of numerous researches examining persuasion in topics as diverse as restrained eating (Boyce & Kuijer, 2014), internet recruitment (Gregory, Meade & Thompson, 2013), communication about food risks (Frewer, Howard, Hedderley & Shepherd, 1997), social influence in counseling (McNeill & Stoltenberg, 1989) and others. More interestingly for the topic of this thesis, research incorporating Elaboration likelihood model was also performed in the online environment regarding themes such as web personalization (Tam & Ho, 2005), online shopping (Yang, 2015) and website design (Cyr, Head, Lim & Stibe, 2018).

Regarding this, one important finding from the previous research on Elaboration likelihood model is that in the online context, both central and peripheral route are engaged since a peripheral cue, for instance, appearance of the website, can also cause high involvement of the individual (San Jose-Cabezudo, Gutierrez-Arranz & Gutierrez-Cillan, 2009, p. 305).

To apply this specifically to online recommendations, Tam and Ho, also using Elaboration likelihood model, suggest that the recipient of the persuasive message may invoke the rule that the personalized recommendations are tailored for them and therefore can be trusted (2005, p. 275) which is precisely the characteristic of peripheral processing route. However, the authors also argue that the content quality of the message's arguments is the variable that engages central processing route.

Applying this logic to Amazon's recommender systems, the fact that they are personalized for each user may equally be observed as the persuasion type which triggers the peripheral route, meaning that it requires low elaboration, while the content of the information itself goes through the central route, meaning that it requires high elaboration. In order to address this theoretical concept in the case of Amazon, this thesis sets itself a task to explore the correlation of the amount of elaboration of Amazon's recommendations by its users and their influence on these users.

2.3.2 Persuasion knowledge model

In the theoretical section of this thesis, this special chapter on persuasion was introduced with the aim of clarifying the activity of influencing the consideration set of the consumer. While it is evaluated that the elaboration likelihood model is a strong basis for explaining this, another model of persuasion will be evaluated as it provides a bit different view on the process of persuasion and should therefore supplement the elaboration likelihood model.

Persuasion knowledge model (Friestad & Wright, 1994) seeks to explain how recipients cope with persuasive attempts. As such, it puts primary focus on the recipient's knowledge and awareness about the persuasion techniques as a variable that decides whether the sender's persuasion messages will produce wanted effect or not. Based on this model, the persuasion can be described as a conflict between the agent and the persuasion target in which they both possess certain persuasion knowledge. The agent's persuasion knowledge consists of the knowledge about the topic of persuasion and of the knowledge about the target's coping mechanisms, while the target's persuasion knowledge consists reciprocally of its own knowledge about the topic of persuasion, as well as of the knowledge about agent's persuasive techniques, based on the previous experience. The authors' arguments (Friestad & Wright, 1994, p. 8) further suggest that the outcome of a persuasive episode significantly depends on the persuasive competence, which is the value that the targets give to the agents based on agents' persuasive techniques. The persuasion competence consists of targets' perceived effectiveness of the agents (i.e. – do they provide psychological effects that strongly affect buying decisions), and of the targets' perceived appropriateness of the agents (i.e. – whether the persuasive techniques are normatively acceptable and moral). Furthermore, through certain research efforts, some conclusions were made regarding the influence categories that were introduced in the previous chapter, and that are relevant for this thesis. Regarding the perceived value as assessed by the consumer, which is essentially an evaluation of product's price and quality balance, Hardesty, Bearden and Carlson (2006, p. 6) established that the lower persuasion knowledge of the consumer correlates with the chances of that consumer being "more susceptible to surcharge" during the persuasive episode. As for the advertisements as an influence, research of Tutaj and Reijmersdal (2012) shows that the persuasion knowledge varies depending on whether the advertising content is subtle (such as sponsored articles) or prominent (such as banners) as well as that the consumers find the former as more informative and interesting, while the latter annoying and irritated. Tutaj and Reijmersdal therefore

conclude (2012, p. 15) that the higher the persuasion knowledge of the consumer for the ad is, the higher is its skepticism as well as its irritation by the ad.

Along with the elaboration likelihood model, the persuasion knowledge model provides a solid theoretical backbone for this research, as it decreases the level of abstraction regarding the concept of persuasion. Furthermore, it serves as the base for introducing certain variables in the research. It points to the questions regarding the assessment of the artificial intelligence by the consumers on Amazon.com, such as the sub-question which is interested to know whether the person's knowledge of artificial intelligence affect how likely they are to follow algorithmic recommendations. This will be further assessed in the continuation of the thesis.

2.4 Theory overview

Now that all the theoretical concepts are explained in their respective chapters and subchapters, it seems useful to present the big picture by outlining the backbone of this thesis and identifying what is being researched. This will be done in the following subchapter.

2.4.1 The outline of the theoretical framework

Prior to every purchase on the Amazon, the consumer is faced with the decision-making process in which they both consciously and unconsciously evaluate between various purchasing alternatives regarding brands and products. All the known alternatives to the consumer that it didn't categorically exclude from the purchase possibilities enter its consideration set - the consumer's cognitive bubble that is that is active from the initiation of the decision-making process up to the purchase choice.

The consideration set can be extremely dynamic, as various external influences compete to inject their agendas regarding positive reaction towards certain brands and products into it and influence the purchase decision. Notable of these influences are word of mouth, marketing communication, perceived value and, for the purposes of this thesis – Amazon's recommendations. The role of the mentioned influences, (especially the ones related to sales and marketing efforts) is to persuade the consumer to open the consideration set and let their agendas inside, and to keep them there all the way until the purchase decision.

The consumer will respond to these persuasion attempts by assessing the received information through central processing route if they are motivated and have cognitive ability to do so, or

through the peripheral processing route if they lack the motivation and ability. In the case of online recommendations, consumer will use both routes to assess different pieces of information. Central route will be used to evaluate the content and argument of the recommendation, while the peripheral route will be used as a cue that the recommendation was tailored for that specific user, and therefore is legitimate. Furthermore, the persuasion attempt can be observed as a process that takes place between the agent of persuasion and the target of persuasion, whereas both are equally aware of the persuasion that is taking place and are actively participating. This means that the success of the persuasion depends on whether the target evaluates that the agent is efficient in providing the rationale for the purchase of a product, as well as that the agent's techniques are morally and normatively appropriate.

Based on the presented, the aim of this thesis is to explore to what extent are Amazon's item-to-item recommendations successful as influencers in the consideration sets of the consumers based on what we know about their persuasive nature. To explore this, Amazon's recommendations' influence will be compared to other influences that have proved to be successful persuaders - already defined Amazon's recommendations, word of mouth, marketing communication and perceived value.

2.4.2 Hypotheses

Once the data for this research is gathered, the statistical operations and tests performed in IBM SPSS 24 software may produce interesting findings regarding the correlations of the variables. It was decided that five hypotheses will be tested in this thesis, three regarding the comparisons of Amazon's influence with other stated influences and two regarding the persuasion process, one focusing on elaboration and the other on persuasion knowledge. These hypotheses naturally follow the concepts and arguments that were presented in this section. The hypotheses concerning influences categories are the following:

> H1*: Recommendations have a higher influence on Amazon's costumers' choices than marketing communication.*
>
> H2*: Recommendations have a higher influence on Amazon's costumers' choices than word of mouth.*

H3*: Recommendations have a higher influence on Amazon's customers' choices than the perceived value of the product.*

The rationale for this kind of configuration of comparisons is because of the previous findings which show that recommender systems have the highest influence among recommendation sources even when they are perceived as possessing less expertise than human experts (Senecal & Nantel, 2004, p. 167). In addition to this, recommendation systems positively affect consumers' willingness to pay for products, even when the recommendations contain significant errors (Adomavicius et al., 2017). The recent research on algorithmic appreciation by Logg, Minson and Moore (2019) further showed that people prefer algorithmic judgment not only over the other people's judgment but also over their own judgment, and that this phenomenon concerns visual estimates and predictions of geopolitical and business events, popularity of songs and prediction of romantic attraction. All of this points to a conclusion that society is starting to rely and put more trust in artificial intelligence and the algorithmic recommendations, which can therefore also be expected for the recommender systems of Amazon.

Furthermore, to explore the persuasion attempts of Amazon and customers' responses to it, the two remaining hypotheses concern how their persuasion coping mechanisms affect the success of recommendations' influence on them. These hypotheses are stated below:

H4*: Higher elaboration of information regarding Amazon's recommender systems leads to lesser influence by these systems.*

H5*: Higher persuasion knowledge regarding Amazon's recommender systems leads to lesser influence by these systems*

The rationale for this kind of configuration of expected correlation is the fact that skeptical consumers- the ones who tend to have developed persuasion knowledge and who are more prone to critically assess persuasion attempts, tend to be harder to persuade (Aytekin, 2015., Obermiller & Spangerberg, 1998).

3. Methodology

3.1 Choice of method

While the influence of recommendations on the purchase decisions of Amazon's customers is certainly a topic that presumes prospects for qualitative research, to answer the research question *To what extent do recommender systems influence the purchase choice of Amazon's customers?* this thesis opted for the quantitative exploration.

As Bryman suggests (2012, p. 36), quantitative strategy emphasizes quantification in the collection and analysis of data, its approach to relationship between theory and research is deductive rather than inductive, and it finds ontological orientation in objectivism, rather than constructionism. It is precisely due to this deductive approach, quantifiability and objectivism that this method was chosen, since the mentioned characteristics were identified as the ones that could ensure the proper operationalization of the previously presented theoretical concepts. Namely, the reasoning was that by using the numerical scores in the form of Amazon's users' agreement level to the statements regarding both influences and persuasion, comparison of influences and correlation of persuasion coping mechanisms and Amazon's influence could be objectively tested.

Following this logic, a survey in the form of questionnaire was chosen as proper technique of data collection. A survey is a method in which quantifiable data about many people in a certain point of time is collected with aim of examining the connection between the several variables and of detecting possible existing patterns of association (Bryman, 2012, p. 60). Furthermore, survey is an appropriate method for the collection of standardized data that is used for testing the hypotheses which can be done by distributing the questionnaire (Kelley, Clark, Brown & Sitzia, 2003, p. 261).

Faced by the choice of whether to perform offline or online survey, the latter was chosen due to its overall better convenience starting from the fact that it enables global reach (Evans & Mathur, 2005, p. 196). Timewise, online method is more suitable as it gives respondents the opportunity to take as much time as they need and choose the moment when it is convenient for them to take the survey (Regmi, Waithka, Paudyal. Simkhada & van Teijlingen, 2016, p. 641). Also, online survey is cost-efficient as it excludes the costs of printing papers and it gives access to specific online communities that would be harder to reach and contact in offline environment (Wright, 2017);

such is the case of community of Amazon's shoppers. Naturally, the online method also has some disadvantages such as issues regarding difficulty of direct contact and access to some communities since e-mail addresses may not available or moderators could refuse to grant access to their communities (Wright, 2017). Some other issues, as noted by Evans and Mathur (2005, p. 201-202) include inability to provide clarifications of the survey and its questions to the participants during their filling-in process. Also, there may be some technical problems regarding internet connection or understanding of the internet protocols, also representativeness issues as well as privacy concerns.

Nevertheless, it is evaluated for this research that the advantages of online surveying outweigh the disadvantages, further so as the impact of the stated disadvantages can be minimized in the upcoming research. Namely, to circumvent the problem of direct contact, the response rate will be statistically improved by high quantity of posts of the survey on various groups on social media platforms. Next, to reduce the problems regarding the clarity of survey, instructions both at the beginning of the questionnaire and before each question are made as clear as possible and the e-mail address of the researcher is provided in case of any additional questions by participants. Regarding the privacy concerns, in the beginning of the questionnaire respondents are explicitly informed about the data handling and the nature of its use for the purposes of research at the Erasmus University. Participants are also directly asked to indicate their consent for participation, the action without which it isn't possible for them to proceed to fill in the survey. Lastly, the stated difficulties for participants regarding issues of the internet itself (such as lack of accessibility and disability to use Internet) can be neglected since this thesis explores users who actively visit the Amazon's website, meaning that it is expected that such problems don't apply to them.

3.2 Data collection

To reach the participants for the survey, the non-probability technique of sampling was engaged, meaning that non-randomized method was used and that the identification of suitable participants was up to researcher's judgement. While it is noted that this technique may have its shortcomings in the lack of generalizability, it is chosen as it is easy to apply, inexpensive and less complicated in comparison to randomized sampling methods (Showkat & Parveen, 2017). To further explain the sampling technique, among non-probability techniques, the mixed sampling technique containing elements of purposive sampling and snowball sampling was used. Purposive

sampling means that the selection of participants was aligned to the purpose of the research; hence the target were the communities of Amazon users, while the snowball technique means that people who respond to the survey are asked to further spread the survey (Showkat & Parveen, 2017), in this case to other Amazon's users that they know of.

Following this sampling strategy, in the period between May 13th and May 20th, the questionnaire was distributed across digital social media platforms; namely Twitter, Facebook, LinkedIn and Reddit. The targets were groups, posts, tweets and communities with the name, description or content which suggested that they could be an adequate place to reach Amazon's customers, such as the ones labeled "Amazon's users", "Amazon UK", "Amazon US", "Online shoppers" etc. Also, communities with interest in marketing and artificial intelligence were contacted as well as asked to help spread the survey.

To filter the responses once they were gathered, the main requirement for the entrance of the data into the analysis was that the participants are active Amazon's users, meaning that they have purchased something through Amazon during the last six months, and that they are older than 18. As for the further sample related aspects of the research, there weren't any noticeable limitations or focuses regarding demographics of the participants.

The termination of the survey on May 20th resulted in 266 recorded responses, However, 34 of those were by participants that only partially filled in the survey, which is why they were immediately excluded from the research. Furthermore, since 20 respondents answered that they didn't use Amazon to purchase something in the last six months, they weren't qualified to participate in the survey and were therefore also excluded. Once the data was imported into IBM SPSS 24 for analysis, it was further established that five respondents, despite consenting, indicated that they were younger than 18, so these were also excluded. Finally, after these reductions and data cleaning, the number of qualified participants for the analysis was 188.

Of those 188 respondents included in the analysis, 60.1% were men (n=113), 36.7% were women (n=69), 1.6% identified as other gender (n=3) and remaining 1.6% of survey takers preferred not to disclose their gender (n=3). Respondents were between 18 and 66 years old, with the average age being 29.62, median being 27 and mode being 23. Regarding the nationalities, the data set contained 29 nationalities from five continents (Europe, North and South America, Asia and Australia) with the significant 43.1% of participants being citizens of the United States of America (n=81). After the United States, the three next most represented countries were Croatia

with 11.7% (*n*=22), Germany with 9.3% (*n*=18) and United Kingdom with 9.0% of respondents (*n*=17). From the overall data set, as much as 91% of participants indicated that they had their own personal Amazon account (*n*=171) (while for the other 9%, it may be speculated that they use accounts from family, friends, share an account etc.). Regarding the purchase frequencies, close to half of all participants (45.2%) have used Amazon to buy something only 1 to 5 times in the last six months (*n*=85), while 16% of them have used it more than 20 times in the given time frame (*n*=30). As for the product categories, the most popular ones to order from Amazon amongst the participants were consumer electronics, media products (books, CD's and DVD's) as well as health and personal care items. For each of these, more than half of all participants indicated that they have ordered a product in the last six months that falls within them (consumer electronics = 63.3%, media products = 55.9%, health and personal care = 53.7%).

The aim of this chapter was to describe the sampling and sample of the research in order to present the characteristics of participants of this research. As observable, the data indicates that the participants of this research are mostly citizens of the European Union and The United States of America and that most of them have their own personal account on Amazon, the most popular products they order being consumer electronics, media products and health and personal care items. Also, the demographics indicates young population with the dominant gender being male, but not by significantly large extent.

Once the data have been gathered, the next step was to proceed to the analysis with the aim of addressing the hypotheses. Before continuing with the results of the analysis, however, the operationalization of the theoretical concepts needs to be presented. This was a crucial step in the construction of the survey which aimed to ensure the reliability of the research findings.

3.3 Operationalization

After the hypotheses for this research have been constructed, abstract concepts of influences on consideration set, elaboration likelihood model and persuasion knowledge needed to be concreted, shaped and presented to the participants of the study in a way that would ensure hypotheses to be answered properly. To do so, these concepts were measured with questions presented to the participants of the survey that included seven-point Likert-scale statements of agreement. Likert-scales are set as statements for which the respondents are asked to show the level of their agreement on a scale from "strong agreement" to "strong disagreement". Statements

are then grouped into factors using factor analysis, the statistical operation which reveals the dimension of participant's attitude about the issue that the research explores (Joshi, Kale, Chandel & Pal, 2015, p. 397).

As for the construction of these scales regarding the content of the statements, especially for the statements regarding influences, the primary inspiration for their creation was found in the book *Handbook of marketing scales: multi-item measures for marketing and consumer behavior research* (Bearden, Netemeyer & Haws, 2011). This is a collection of multi-item self-report measures used in consumer behavior and marketing research which has proved useful since it includes certain templates of questions regarding influences and purchase decisions. Furthermore, to construct the persuasion scales regarding concepts of persuasion knowledge, the article *How to measure persuasion knowledge* by Ham, Nelson and Das (2015) was used as it also provides certain useful templates.

In the following pages the operationalization of these concepts will be further presented starting with the influences and then moving on to persuasion.

3.3.1 Operationalization of Influences

As mentioned earlier, along with Amazon's recommendations, the proposed categories of influences on consideration set in this research were marketing communication, word of mouth and perceived value. These categories were introduced to ensure that the research indeed covers relevant influences on the consideration set and enables the comparison of these with the influence of Amazon's recommendations, all with the aim of answering the research sub-question *How do Amazon's recommendations as an influence compare with other influences in affecting the purchase decisions of Amazon's customers?*

Regarding *Marketing communication*, the scales were mostly focused on advertisements, as they measured to what extent respondents find them reliable, insightful and deceitful. Other than advertising, this category also included one scale about brand messages on social media as the respondents were asked to evaluate the information on products that they see there. Foundation for the operationalization of this influence were scales from *Public opinion towards advertising* (Bearden et al., 2011, p. 332) category of scales in the *Handbook of marketing scales.*

Regarding *Word of mouth*, the scales were set to investigate whether the respondents were more comfortable to buy a product when people have given them the opinion about it and whether they tend to seek advice from friends and take into consideration online reviews submitted by strangers. Foundation for the operationalization of this influence were scales from *Information seeking* (Bearden et al., 2011, p. 102) *Opinion seeking* (Bearden et al., 2011, p. 105), and *Tradition as a factor* (Bearden et al., 2011, p. 352) categories of scales in the *Handbook of marketing scales.*

Regarding *Perceived value* or price-quality ratio, the rationale of scales was to find out to what extent the Amazon's users tend to search for the lower prices and be aware of the alternatives before purchasing products. Foundation for the operationalization of this influence were scales from *Purchase decision involvement* (Bearden et al., 2011, p. 268) and *Price perception* (Bearden et al., 2011, p. 378) categories of scales in the *Handbook of marketing scales.*

Unlike for the presented influences, the scales that could refer to influence of Amazon's recommendations weren't abundant in the literature. Therefore, to create the scales for measuring Amazon's recommendations, the rationale was to be as specific as possible in order to get respondents to understand the statements and answer them properly, respecting clarity, focus and proper syntax. It was decided therefore that participants indicate whether they follow the Amazon website's recommendations when purchasing products and the logic behind the order of their appearance, as well as whether they self-perceive that they are influenced by them.

The categories mentioned above were constructed in such manner as means of preparation for the exploratory factor analysis, a statistical method whose purpose is to explain larger set of variables with smaller latent constructs (Henson & Roberts, 2006, p. 394), or in other words, to group scales into adequate categories.

3.3.2 Factor analysis of Influences

Before performing the factor analysis, two of the scales from the marketing communication were reversed ("Most advertising is intended to deceive rather than to inform" and "Most advertising makes false claims") as they differed from the rest of the variables in their original form due to their negatively constructed statement syntax. This means that the reversed logic of numbering was applied to them in SPSS (1=7, 2=6, 3=5, 4=4, 5=3, 6=2, 7=1) so that they could be numerically and logically aligned with the all other variables and produce meaning accordingly.

Finally, 18 seven-point Likert-scale based items regarding the influences were entered into the factor analysis using Principal Components extraction with Varimax rotation based on Eigenvalues (>1.00), +*KMO* = .79, χ^2 = 986.51, $p < .001$. The resultant model explained 63.7% of the variance in Influences. Factor loadings of individual items onto the four out of five factors proved to follow the logic pre-specified in the construction of the research. In that sense, the first four categories (factors) that resulted from the factor analysis were indeed *Amazon's recommendations* (α = .82, *M* = 15.24, *SD* = 6.00), *Marketing communication* (α = .79, *M* = 15.13, *SD* = 5.46), *Word of mouth* (α = .65, *M* = 16.43, *SD* = 3.05) and *Perceived value* (α = .63, *M* = 17.06, *SD* = 2.94). However, since the reliability analysis for the *Word of Mouth* indicated that the removal of one scale would improve the overall reliability of the factor (to α = .72, *M* = 5.76, *SD* = 1.02), that particular scale ("I seek advice from friends on which products I should buy") was indeed removed, leaving the factor with only two scales ("I feel more comfortable buying a product when people have given me their opinions on it" and "The online reviews submitted from strangers affect whether or not I will buy a certain product").

Additionally, factor analysis produced a fifth factor, the one that consisted of two scales, namely "I use brands that my family buys or has bought in the past" and "I am more likely to buy products that are on the discounts". However, due to the fact that this factor consisted of only two items for which the reliability was too low (α = .33) as well as the fact that no significant mutual meaning could be assigned to these two items, the factor was dropped out of the research and the two scales went back to the independent state. Therefore, the four factors that were set to be used in the analyses for influences were the same as the categories of influences specified before the data collection – *Amazon's recommendations*, *Marketing communication*, *Word of mouth* and *Perceived value*. Their factor analysis scores (rotated component matrix) can be viewed in Table 1 below.

Table 1: Influences on purchase of Amazon's customers: Item loadings on a four factor principal components solution.

	Amazon's recommendations	Marketing communication	Word of mouth	Perceived value
I (dis)agree with the following statement:				
- Amazon's recommendations affect my purchase choice	.800	.		
- I follow recommendations on Amazon when purchasing a product	.794		.	
- Amazon's recommendations work well in determining which products I may like	.761	.		
- I am more likely to follow the first result/recommendation of Amazon rather than second or third	.724			
- Most advertising is intended to deceive rather than to inform (Reversed)		.761		
- Advertising is reliable source of information about the quality and performance of products		.759		
- Most advertising makes falls claims (Reversed)		.708		
- Brand messages on social media give me essential information about products		.695		
- Ads give me essential information about products		.686		
- I feel more comfortable buying a product when people have given me their opinions on it			.770	
- I seek advice from my friends on which products I should buy			.690	
- The online reviews submitted from strangers affect whether I will buy a certain product or not			.663	
- I'm willing to make an extra effort to find lower prices				.776
- It is important for me to be aware of all the alternatives before buying an expensive item				.762
- I always check alternatives on Amazon.com to be sure I get the best value for money I spend				.670
Cronbach's alpha	.82	.79	.65	.63
Eigenvalue	4.25	2.34	1.77	1.40

3.3.2 Operationalization of Persuasion

To find a feasible way to answer the remaining two hypotheses of this thesis and accordingly to the research sub-question *To what extent Amazon's recommendations' influence differ depending on the users' persuasion knowledge and their degree of the elaboration of recommendations?*, it was important to operationalize the models of persuasion knowledge and elaboration likelihood.

The Likert scales whose focus was on measuring elaboration were seeking to investigate the amount to which respondents gave thought about the logic behind Amazon's recommendations or why Amazon would think that these would be appropriate for them. What was also measured here was the extent to which respondents assigned legitimacy to the recommendations because of the fact that they are personalized for each customer. The foundation for the constructed scales was found in the scale categories *Thinking potential* (Bearden et al., 2011, p. 34) and *Impulsiveness* (Bearden et al., 2011, p. 73) of the *Handbook of marketing* scales. Furthermore, literature on elaboration likelihood itself (Petty and Cacioppo, 1986; Tam & Ho, 2005) provided rationale to focus on measuring motivation and ability and on the concept of personalization while constructing scales.

Next, the concept of persuasion knowledge was operationalized with the aim to measure whether respondents are aware of the logic and of possible sales agendas behind Amazon's recommendations on the website. The foundation for these scales was the article *How to measure Persuasion knowledge* (Ham et al., 2015) from which the existing scales were mostly taken and slightly modified to fit in this research on Amazon. For instance, the scale "I can see through sales tricks and gimmicks used by salesmen" would be transformed into "I can see through sales tricks of Amazon to get costumers to buy certain products.

In the same manner as for the *Influences* variables, prior to the factor analysis, the three *Persuasion* scales were reversed using IBM SPSS 24 ("The fact that the recommendations on Amazon are personalized for me makes me think they are legitimate", "I don't give too much thought about the logic behind Amazon's recommendations" and "The order in which Amazon's recommendations appear on the website is legitimate because it was made to suit me personally") as they were the only ones among *Persuasion* scales that were set to indicate lack of skepticism and lack of evaluation of the incoming information, instead of the opposite.

3.3.3 Factor analysis of Persuasion

Following this, 8 seven-point Likert-scale based items regarding the persuasion (both Elaboration and Persuasion Knowledge) were entered to the factor analysis using Principal Components extraction with Varimax rotation based on Eigenvalues (>1.00), $+KMO = .58$, $\chi^2 = 294.7$, $p < .001$. The resultant model indicated three factors which cumulatively explained 65.4% of the variance. The first two factors were the expected ones, *Elaboration* ($\alpha = .65$, $M = 12.23$, $SD = 3.98$) and *Persuasion Knowledge* ($\alpha = .51$, $M = 15.29$, $SD = 3.06$), while the two additional scales regarding personalization ("The fact that the recommendations on Amazon are personalized for me makes me think they are legitimate" and "The order in which Amazon's recommendations appear on the website is legitimate because it was made to suit me personally") were matched together under the high reliability score ($\alpha = .81$, $M = 9.71$, $SD = 2.54$) and therefore formed a separate factor named *Personalization*. And since even without these items *Elaboration* factor contained three reliable scales, this separation didn't prove to harm the research process or make the H4 less possible to answer. On the contrary, it complemented the research with valuable finding - giving additional insight about the importance of personalization in the purchase process.

What did initially seem as a problem after the factor analysis was the fact that *Persuasion Knowledge* factor had not too strong reliability ($\alpha = .51$). Therefore, in order to answer the last hypothesis, H5, the decision was made to "break up" this factor and to answer H5 by addressing each of the three scales ("I understand how Amazon makes recommendations", " I'm aware that Amazon uses recommendations as means to sell more products" and "I can see through sales tricks used by Amazon to get consumers to buy certain products") separately.

Results of the factor analysis (rotated component matrix) for *Persuasion* scales can be found in the Table 2 below.

Table 2: Amazon customers' persuasion coping: Item loadings on a three-factor principal component solution.

ITEMS	Personalization	Elaboration	Persuasion Knowledge
I (dis)agree with the following statement:			
- The order in which Amazon's recommendations appear on the website is legitimate because it was made to suite me personally (Reversed)	.898		
- The fact that the recommendations on Amazon are personalized for me makes me think they are legitimate (Reversed)	.886		
- I often wonder about the logic behind the order of recommendations that appear on the Amazon		.803	
- I don't give too much thought about the logic behind Amazon's recommendations (Reversed)		.795	
- When seeing a recommendation for the product on Amazon, I try to evaluate why Amazon would think that this product is suitable for me		.679	
- I understand how Amazon makes recommendations			.753
- I can see through sales tricks used by Amazon to get consumers to buy certain products			.725
- I'm aware that Amazon uses recommendations as means to sell more products			.630
Cronbach's alpha	**.81**	**.65**	**.51**
Eigenvalue	2.01	1.75	1.48

3.4 Methodology overview

In this methodological section of the thesis, it was first argued that the survey in the form of questionnaire was found as most suitable method for this research due to its efficiency regarding time process, and as it is a less intrusive method. It was described how the survey was distributed across relevant social media channels and that the most respondents were from the United States and European Union.

And though issues of reliability and validity are hard to eliminate completely while constructing any research, it was the aim of this thesis to minimize these risks as much as possible. As mentioned, to ensure the reliability of research by making it objective rather than subjective while creating scales, the rationale for their construction was according to the existing scientifically acknowledged scales from *Handbook of marketing scales: multi-item measures for marketing and consumer behavior research* (Bearden et al., 2011) and from the systematic review of persuasion knowledge scales by Ham, Nelson and Das (2015). As for the validity of the research, the quantitative approach in the form of survey was chosen as it was suitable to explore both sub-questions of the thesis. Namely, comparison of influences seems objective when able to be numerically expressed, as well as persuasion coping, which is backed by the fact that persuasion knowledge is most commonly researched using survey as a method (Ham et al., 2015). To further assure validity of this research, participants were chosen among Amazon's users who are active on the platform and they were assured that they can leave the research at any point, minimizing the pressure put on them while filling in the questionnaire.

Finally, the results from the factor analysis were presented to indicate that the theoretical concept of consideration set including four relevant influences as well as concepts of elaboration likelihood model and persuasion knowledge were successfully operationalized and ready to be used in statistical tests in order to answer hypotheses. All the choices made regarding factors after the factor analysis were in accordance with the maximization of the reliability of the research.

In regards to this, it has been noted that while the hypotheses H1, H2, H3 and H4 will be answered using the factors that are aligned to the categories as specified prior to the factor analysis, the last hypothesis H5 will be addressed three times - individually by each of the three scales that were specified for the factor *Persuasion knowledge*.

4. Results

Once the theoretical concepts were operationalized, put into the measurable Likert scales and as the factor analysis produced factors, the data of the research was ready to provide answers to the hypotheses. To do so, statistical tests were performed in IBM SPSS 24. In this chapter, findings of these tests will be presented for each of the five hypotheses.

4.1 Influences

Since H1, H2 and H3 have all been set to compare the influence of Amazon's recommendations with certain other influence, once the normality test proved normal distribution, these hypotheses could be answered by performing the paired-samples t-test in SPSS, which, as noted by Field (2009, p. 324), is used to measure the difference between the means of two groups. Now, for each of the hypotheses the results of this test will be presented:

H1: *Recommendations have a higher influence on Amazon's customers' choices than marketing communication.*

To address this hypothesis, a paired-samples t-test was conducted to compare means of the factor *Amazon's recommendations* and factor *Marketing communication*. There was a significant difference in the scores for *Amazon's recommendations* (*M*=3.81, *SD*=1.27) and *Marketing communication* (*M*=3.03, *SD*=1.09) conditions; t (187) = 7.82, p = 0.000. These results suggest that people tend to be influenced more by Amazon's recommendations then by marketing communication when purchasing a product on Amazon; therefore, the hypothesis H1 can be confirmed.

H2: *Recommendations have a higher influence on Amazon's customers' choices than word of mouth.*

To address this hypothesis, a paired-samples t-test was conducted to compare means of the factor *Amazon's recommendations* and factor *Word of mouth*. There was a significant difference in the scores for *Amazon's recommendations* (*M*=3.81, *SD*=1.27) and *Word of mouth* (*M*=5.75, *SD*=1.02) conditions; t (187) = -20.5, p = .000. These results suggest that people tend to be less

influenced by Amazon's recommendations then by word of mouth when purchasing a product on Amazon; therefore, the hypothesis H2 can be rejected.

H3: *Recommendations have a higher influence on Amazon's customers' choices than the perceived value.*

To address this hypothesis, a paired-samples t-test was conducted to compare means of the factor *Amazon's recommendations* and factor *Perceived value*. There was a significant difference in the scores for *Amazon's recommendations* (*M*=3.81, *SD*=1.27) and *Perceived value* (*M*=5.69, *SD*=0.98) conditions; t (187) = -16.8, p = 0.000. These results suggest that people tend to be less influenced by Amazon's recommendations then by perceived value when purchasing a product on Amazon; therefore, the hypothesis H3 can be rejected.

To conclude, the results from the paired-samples t-test for the hypotheses regarding the influences on consideration set suggest that Amazon's recommendation influence is only higher than the influence of marketing communication. Furthermore, based on the means obtained from the t-tests, the hierarchy of influences looks as follows:

1. *Word of mouth* (*M*=5.75)
2. *Perceived value* (*M*=5.69)
3. *Amazon's recommendations* (*M*=3.81)
4. *Marketing communication (M*=3.03)

(for all combinations of comparisons $p<0.05$ with exception of the comparison of *Word of mouth* and *Perceived value*.)

4.2 Persuasion

While for the comparisons of influences the performing of the t-tests was sufficient to get the results, the hypotheses H4 and H5 required a more sophisticated test. Since these hypotheses contain both continuous independent and dependent variables, they are suitable to be answered using the linear regression, a statistical test in which one variable serves as a predictor and the other serves as outcome variable (Field, 2009, p. 198). In this thesis all the independent variables regarding *Persuasion* (factor *Elaboration*, three separate scales regarding factor *Persuasion knowledge* and factor *Personalization* which was to be assessed even though it was not specified in the hypotheses of the research in search for interesting findings) were tested in a single regression model to find correlation with dependent variable *Amazon's recommendations*.

After normality tests confirmed normal distribution of all variables, a regression model containing the five mentioned predictors proved to be significant, F=18.01, p=.000, R^2=.33. In the continuation of the chapter, the results for each of the variables will be assessed and their associated hypothesis addressed. This will also be done with the *Personalization* factor.

H4: *Higher elaboration of information regarding Amazon's recommender systems leads to lesser influence by these systems*

To answer this hypothesis, as discussed, a linear regression with the influence by *Amazon's recommendations*' score as criterium and *Elaboration* as one of the predictors was conducted. The elaboration amount showed to have a significant positive influence on being influenced by Amazon's recommendations while purchasing (β = .17, p = .007).

Since the results indeed point to the positive correlation between two variables rather than a negative one, the hypothesis H4 has to be rejected.

H5*: Higher persuasion knowledge regarding Amazon's recommender systems leads to lesser influence by these systems*

As mentioned earlier, due to the reliability issues of the factor *Persuasion knowledge*, the decision was made during the operationalization of the variables to address this last hypothesis in a different manner. Namely, the three variables (scales) that have previously formed the mentioned

factor (“I understand how Amazon makes recommendations”, “I’m aware that Amazon uses recommendations as means to sell more products” and “I can see through sales tricks and gimmicks used by Amazon”) will be now be presented in sub-hypotheses and be answered separately.

H5a: *Higher understanding of how Amazon makes recommendations leads to lesser influence by them*

To answer this sub-hypothesis, as mentioned earlier, a linear regression with the influence by *Amazon’s recommendations*’ score as criterium and understanding of their creation as one of the predictors was conducted. The understanding of Amazon’s recommendations’ creation showed no significant correlation on being influenced by Amazon’s recommendations while purchasing (β = .00, p = .995). The sub-hypotheses H5a therefore couldn’t be confirmed.

H5b*: The understanding of the fact that Amazon uses recommendations as sales instrument leads to lesser influence by them*

To address this sub-hypothesis, as mentioned earlier, a linear regression with the influence by *Amazon’s recommendations*’ score as criterium and understanding of the marketing aspect of the recommendations as one of the predictors was conducted. The understanding of marketing aspect of the recommendations showed no significant correlation on being influenced by Amazon’s recommendations while purchasing (β = .10, p = .113). The sub-hypothesis H5b therefore couldn’t be confirmed.

H5c*: Understanding of the sales tricks behind Amazon’s recommendations leads to lesser influence by them*

To address this sub-hypothesis, as discussed, a linear regression with the influence by *Amazon’s recommendations*’ score as criterium and understanding of the Amazon’s sales tricks as one of the predictors was conducted. The understanding of Amazon’s sales tricks had a significant negative correlation on being influenced by Amazon’s recommendations while purchasing (β = -.21, p = .002). Therefore, the sub-hypothesis H5c could be confirmed.

According to the *Persuasion knowledge* results presented above, while no significant correlation was found regarding first two variables, it was concluded that people indeed tend to be less influenced by Amazon’s recommendations if they understand Amazon’s sales tricks.

As previously mentioned, the factor analysis of *Persuasion* produced the third factor - *Personalization* next to *Elaboration* and *Persuasion knowledge* Despite the fact that it wasn't specified in the hypotheses, *Persuasion* was also analyzed in the same manner as *Elaboration* and *Persuasion knowledge*, assessing whether there is a positive correlation between the perception of recommendations as positive because they are personalized and being influenced by Amazon's recommendations.

Therefore, as discussed, a linear regression with the *Amazon's recommendations*' (influence) score as criterium and trust in them due to personalization as predictor was conducted. The trust in recommendations due to their personalizing nature had a significant positive correlation on being influenced by Amazon's recommendations while purchasing (β = .49, p = .000).

4.3. Findings and discussion

4.3.1 Influences

Concerning the impact on purchase decisions, this research shows that Amazon's recommendations' influence isn't higher when compared to the influence of customers' perceived value of the product (price-quality ratio) or to the word of mouth sources (opinion of other people, online reviews). Research also shows that Amazon's influence on purchase decisions tend to be higher when compared to the influence of marketing communication sources (ads, social media PR messages).

In the hierarchy of the four relevant influences on the purchase decisions of Amazon's customers, *Amazon's recommendations* took the third place, scoring lower than *Word of mouth*, contrary to what was expected based on the algorithmic appreciation trends (Logg et al., 2019, Senecal & Nantel, 2004) and lower than *Perceived value*, contrary to what previous research concluded about consumers' impulse and willingness to pay for the products as the results of them being suggested as recommendations (Adomavicius et al., 2017).

The reason behind these contradictions may be in two factors. First, two of these researches (Adomavicius et al., 2017; Logg et al., 2019) regarding recommendations didn't put whole focus on the e-retail but were either widespread in their exploration of recommender systems across platforms of many types or they focused predominantly on media products. Second, while Senecal & Nantel (2004) do focus on e-retail sector when exploring recommendations' influence, their

research was performed decade and a half ago, with the internet expansion happening later than that. In the meantime, the online buyers may have become more adjusted to the fact that algorithms are also marketers and salesmen, therefore gradually developing persuasion coping mechanisms in the online environment. Due to the stated factors- or to put it differently- due to the differences in findings of previous research and this one, it can be interpreted that people nowadays tend to be less influenced by the recommender systems in e-retail environment and more while choosing intangible products such as songs or videos.

4.3.2 Persuasion

Concerning the *Elaboration* aspect of Amazon's influence, research shows that contrary to the expected, the higher the elaboration of the recommendations by the person, the higher is the likelihood of that person to be influenced by them. Contrary was expected due to a fact that skepticism is often tied to a higher elaboration and better persuasion knowledge, both of which presume resistance to persuasion attempts (Aytekin, 2015., Obermiller & Spangerberg, 1998). To interpret this finding, one could conclude that the reason for such correlation is the trust in the recommendations by those who have high motivation and ability to critically evaluate them. This can be due to the personalized nature of the recommendations of each user, as another finding of this research suggests that those who trust recommendations for this very personalization tend to be indeed more influenced by them.

Concerning the *Persuasion knowledge* aspect of Amazon's influence, the only significant correlation found suggests that those who self-assess that they understand the Amazon's sales tricks and tend to be less influenced by recommendations, which was expected.

These two findings, regarding *Elaboration* and *Persuasion knowledge,* can also be interpreted together, as the elaboration and persuasion knowledge are both part of the persuasion coping mechanism of the consumer. In that sense, whether they recognize the personalization as the main feature and the advantage of Amazon's recommendations may determine their persuasion response. Those who recognize personalization as advantage and something positive may follow the recommendations and those who don't may evaluate them as sales trick of Amazon and therefore not be affected by them.

5. Conclusion

5.1. Reflection on the conducted research

Inspired by the observation of Amazon's rapid growth on the one hand and of the increased use of machine learning in online marketing on the other, the research question set to answer was *To what extent do recommender systems influence the purchase decisions of Amazon's customers?*

To explore this, the focus was primarily put on comparing the influence of Amazon's recommendations with other existing influences on costumers and secondarily, on exploring if there's a difference in how people evaluate and respond to Amazon's persuasion attempt depending on their elaboration of information and their persuasion knowledge.

Regarding the influences, the theoretical concept of consideration set provided insight into the buyer's decision-making process which starts with acknowledgement of the purchase alternatives and ends with the purchase decision, being on constant "attack" from the different influences. These relevant influences were then identified by the help of previous research and literature, so that their impact could be compared to Amazon's recommendations. As for the persuasion, the Elaboration likelihood model and Persuasion knowledge model showed that there is a dynamic process in persuasion as both the agent and the target participate and that every attempt of persuasion can lead to either high or low elaboration by the consumer based on its ability and motivation for elaboration.

The research was performed as an online questionnaire survey, the method which was chosen because of its convenience and because it was suitable for operationalization of hypotheses into the Likert-scaled statements that were presented to the respondents. After the data was gathered, four groups of influences emerged from the factor analysis, namely *Amazon's recommendations*, *Marketing Communication*, *Word of mouth* and *Perceived value*, just as was expected from the construction of the scales. As for the persuasion, factors *Elaboration*, *Persuasion Knowledge* and *Personalization* emerged from the factor analysis, but since the reliability of *Persuasion Knowledge* wasn't the strongest, the decision was made to analyze each of the statements in that factor individually rather than as a group.

To address the primary sub-question of this research *How do Amazon's recommendations as an influence compare with other influences in affecting the purchase decisions of Amazon's*

customers?, it can be concluded that, when compared to recommendations, only marketing communication has lesser influence on Amazon's customers' purchase decisions. Other relevant influences – value of the product (price-quality ratio) as perceived by customer and the word of mouth both proved to be stronger influences on purchase decisions.

As for the secondary sub-question *How Amazon's recommendations' influence differ depending on the users' persuasion knowledge and their degree of the elaboration of the recommendations?,* the results didn't show any statistically significant difference in influence between people with higher and lower understanding of the logic behind Amazon's recommendations and their sales-oriented nature. However, it was observed that people who tend to understand sales tricks of Amazon tend to be less influenced by the recommendations on the platform. Furthermore, regarding the elaboration, results indicate the interesting finding that people who tend to have higher motivation and ability to evaluate Amazon's recommendations tend to be more influenced by these results. Regarding persuasion, additional finding of the research showed that people who tend to trust recommendations' personalization nature are also more influenced by them, which indicates algorithmic appreciation.

The aim of the following subchapter is to provide rationale for the meaning of these results.

5.2. Implications for marketers and consumers

Following the findings of the research, the Amazon's marketers should acknowledge the fact that users who elaborate the recommendations more tend to follow them more. Marketers should therefore work on getting more people to elaborate the recommendations, for instance by finding a way to educate about them and further put emphasis on the process of personalization as rationale to trust them. Furthermore, the fact that conventional marketing communication such as advertising and PR communication scores the lowest in the hierarchy of influences on the purchase decisions is something that has implications for all marketers and should be taken into consideration. Since respondents tend to be more influenced by word of mouth than by advertising, contemporary marketers who offer quality products should put more emphasis on interpersonal marketing, finding a way to generate word of mouth campaigns and generally stimulate indirect communication in order to boost sales.

As stated in the introduction of the thesis, one of the motivations for making an inquiry into the topic of recommendations' influence was the fact that Amazon is becoming an ordinary way

of purchasing so it was needed to assess whether there's too much power in controlling which brands Amazon's consumers get by presenting recommendations. As it turns out, their power is not too high, since the customers significantly more rely on interpersonal influences and tend to seek for the alternatives whose quality would best justify the amount of their money spent. Therefore, it can be concluded that regarding the e-commerce's pivot Amazon, society is still not at the stage where the algorithmic appreciation would triumph over the traditional recommendation sources as people are still reluctant to trust artificial intelligence. Nevertheless, the educational efforts should be greeted, so that the people recognize both advantages and disadvantages of recommender systems.

Finally, the results of this study should serve as inspiration for scientific community to put effort in exploring the trust in recommender systems across various platforms not just in e-retail but also in media consumption, to see if there are differences in the hierarchy of influences which were used in this research. This way, it could be seen how these hierarchies look in various industries. Furthermore, while it is important that future research expands knowledge gathered from this research, it should also re-assess findings of this research by using different techniques and measures, as there are certainly shortcomings of this research design. This is further discussed in the following chapter.

5.3. Limitations and suggestions for further research

This research, like most others, has certain limitations regarding the choices made in its construction which may have affected the results in the certain manner. Since the limitations of this research naturally presume further research to be performed, both limitations and suggestions for further research will be presented together in this chapter.

The first limitation arises from the fact that certain scales presented to the respondents were self-perceptive in nature, meaning that participants had evaluated by themselves whether they think specific influences affect their purchasing habits and whether they elaborate information coming from recommendations and understand persuasion. The next survey attempt could put complete focus of researcher's assessment of Amazon's users regarding these phenomena, rather than partly relying on their self-perception and self-assessment. Furthermore, zooming out of the survey as a method, one should acknowledge its shortcomings regarding the questionability of the honesty of participants' responses, which is why the experiment may prove as another way to

answer the research questions of this research. For instance, it would be interesting to compare results regarding categories of influences on purchase decisions from this research with the ones obtained from the experiment research, especially to see whether marketing communication would also score as low when compared with other stated influences. Since marketing messages are notorious for their subconscious impact on consumers, it may be the case that the agreement statements presented in this research regarding marketing communication didn't suffice in reaching the real conclusion regarding its impact.

Zooming out furthermore, there are limitations in quantitative research itself. For instance, while categories of *Marketing Communication*, *Word of mouth* and *Perceived value* certainly have their relevance in the existing literature which made them a choice for this study, they are indeed the only ones on which this research has focused. Exploratory aspect of qualitative research on this topic, which could be performed in the form of content analysis and interviews, may provide additional insight into the aspects of influences and persuasion, further complementing the findings of this thesis.

6. References

Abideen, Z.U., & Saleem, S. (2011). Effective advertising and its influence on consumer buying behavior. *European Journal of Business and Management, 3*(3), 55-65

Adomavicius, G., Bockstedt, J.C., Curley, S.P., & Zhangc. J. (2018). Effects of online recommendations on consumers' willingness to pay. *Information Systems Research, 29*(1), 84-102. doi:10.1287/isre.2017.0703

Aggarwal, P., Tomar, V., & Kathuria, A. (2017). Comparing content based and collaborative filtering in recommender systems. *International Journal of New Technology and Research, 3*(4), 65-67.

Ahmad, N., Vveinhardt, J., & Ahmed, R.R. (2014). Impact of word of mouth on consumer buying decision. *European Journal of Business and Management, 6*(31), 394-403.

Albari & Safitri, I. (2018). The influence of product price on consumers' purchasing decisions. *Review of Integrative Business and Economics Research, 7*(2), 328-337.

Andrews, C. (1988). Motivation, ability, and opportunity to process information: Conceptual and Experimental Manipulation Issues. *Advances in Consumer Research, 15*, 219-225.

Awan, A.G., & Fatima, A. (2014). Impact of marketing strategies on youth purchasing behavior: A case study of mobile phone industry. *British Journal of Marketing Studies, 2*(4), 72-80.

Ayanwale, A.B., Alimi, T., & Ayanbimipe, M.A. (2005) The influence of advertising on consumer brand preference. *Journal of Social Sciences, 10*(1), 9-16.

Aytekin, P. (2015). Persuasion knowledge and ad skepticism. *International Journal of Research in Social Sciences, 4*(10), 8-14.

Beneke, J., Flynn, R., Tamsin, G., & Mukaiwa, M. (2013). The influence of perceived product quality, relative price and risk on customer value and willingness to buy: a study of private label merchandise. *Journal of Product & Brand Management, 22*(3), 218-228. doi:10.1108/JPBM-02-2013-0262

Bearden, W.O., Netemeyer, R. G., & Haws, K. L. (2011). *Handbook of marketing scales: Multi-item measures for marketing and consumer behavior research.* Thousand Oaks, California: SAGE.

Boyce, J.A., & Kuijer, R.G. (2014). Focusing on media body ideal images triggers food intake among restrained eaters: A test of restraint theory and the elaboration likelihood model. *Eating Behaviors, 15*, 262–270. doi:10.1016/j.eatbeh.2014.03.003

Brown, J.J., & Wildt, A.R. (1992). Consideration Set Measurement. *Journal of the Academy of Marketing Science, 20*(3), 235-243. doi:10.1007/BF02723410

Bryman, A. (2012). *Social research methods*. New York, United States: Oxford University Press Inc.

Cabezudo, S.J., Gutierrez-Arranz, A.M., & Gutierrez C. (2009). The combined influence of central and peripheral routes in the online persuasion process. *Cyberpsychology, Behavior and Social Networking, 12*(3), 299-308. doi:10.1089/cpb.2008.0188

Cyr, D., Head, M., Lim, E., & Stibe, A. (2018). Using the elaboration likelihood model to examine online persuasion through website design. *Information & Management, 55*, 807–821. doi:10.1016/j.im.2018.03.009

Eliaz, K., & Spiegler, R. (2011). Consideration sets and competitive marketing. *Review of Economic Studies, 78*, 235–262. doi:10.1093/restud/rdq016

Evans, J.R., & Mathur, A. (2019). The value of online surveys. *Internet Research, 15*(2), 195-219. doi:10.1108/10662240510590360

Field, A. (2009). *Discovering Statistics Using SPSS*. London, United Kingdom: SAGE Ltd.

Frewer, L.J., Howard, C., Hedderley, D., & Shepherd, R. (1997). The Elaboration Likelihood Model and communication about food risks. *Risk Analysis, 17*(6), 759-769. doi:10.1111/j.1539-6924.1997.tb01281.x

Friestad, M., & Wright, P. (1994). The persuasion knowledge model: How people cope with persuasion attempts. *Journal of Consumer Research, 21*(1), 1-31. doi:10.1086/209380

Gregory, C.K., Meade, A.W., & Thompson, L.F. (2013). Understanding internet recruitment via signaling theory and the elaboration likelihood model. *Computers in Human Behavior, 29*, 1949–1959. doi:10.1016/j.chb.2013.04.013

Haider, T., & Shakib, S. (2018). A study of the influences of advertisement on consumer buying behavior. *Business Studies Journal, 9*(1), 1-13.

Ham, C.D., Nelson, M.R., & Das, S. (2015). How to measure Persuasion knowledge. *International Journal of Advertising, 34*(1), 17-53.

Hauser, J.R. (2014). Consideration-set heuristics. *Journal of Business Research, 67*, 1688-1699.

doi:10.1016/j.jbusres.2014.02.015

Henson, R.K., & Roberts, J.K. (2006). Use of exploratory factor analysis in published research: Common errors and some comment on improved practice. *Educational and Psychological Measurement, 66*(3), 393-416.

Isinkaye, F.O., Folajimi, Y.O., & Ojokoh, B.A. (2015). Recommender systems: Principles, methods and evaluation. *Egyptian Informatics Journal, 16*, 261–273. doi:10.1016/j.eij.2015.06.005

Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology, 7*(4), 396-403. doi:10.9734/BJAST/2015/14975

Katawetawaraks, C., & Wang, C.L. (2011) Online shopper behavior: Influences of online shopping decision, *Asian Journal of Business Research, 1*(2), 66-74.

Kelley, K., Clark, B., Brown, W., & Sitzia, J. (2003). Methodology matters: Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care, 15(3), 261-266.*

Kumar, D.P., & Raju, K.W. (2013). The role of advertising in consumer decision making. *Journal of Business and Management, 14*(4), 37-45.

Lackermair, G., Kailer, D., & Kanmaz, K. (2013). Importance of online product reviews from a consumer's perspective. *Advances in Economics and Business, 1*(1), 1-5. doi:10.13189/aeb.2013.010101

Logg, J.M., Mison, J.A., & Moore, D.A. (2019). Algorithm appreciation: People prefer algorithmic to human judgment. *Organizational Behavior and Human Decision Processes, 151,* 90–103. doi:10.1016/j.obhdp.2018.12.005

Lü, L., Medo, M., Yeung, C.H., Zhang, Y., Zhang, Z., Zhou, T. (2012). Recommender systems. *Physics Reports, 519*, 1-49. DOI: 10.1016/j.physrep.2012.02.006

McNeill, B.W., & Stoltenberg, C.D. (1989). Reconceptualizing social influence in counseling: The Elaboration Likelihood Model. *Journal of Counseling Psychology, 36*(1), 24-33.

Morris, J.D., Woo, C.M., & Singh, A.J. (2005). Elaboration likelihood model: A missing intrinsic emotional implication. *Journal of Targeting, Measurement and Analysis for Marketing, 14*(1), 79–98. doi:10.1057/palgrave.jt.5740171

Obermiller, C., & Spangenberg, E.R. (1998). Development of a scale to assess consumer skepticism toward advertising, *Journal of Consumer Psychology, 7*(2), 159–186.

Pechmann, C., & Catlin, J.R. (2016). The effects of advertising and other marketing communication on health-related consumer behaviors. *Current Opinion in Psychology, 10*, 44-49. doi:10.1016/j.copsyc.2015.12.008

Petty, R.E., & Cacioppo, J.T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology,* 19, 123-205. doi:10.1016/S0065-2601(08)60214-2

Petty, R.E., Cacioppo, J.T. & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology 41*(5), 847-855. doi:10.1037/0022-3514.41.5.84

Regmi, P.R., Waithaka, E., Paudyal, A., Simkhada, P., & van Teijlingen (2016). Guide to the design and application of online questionnaire surveys. *Nepal Journal of Epidemiology, 6*(4), 640-644.

Roberts, J.H., & Lattin, J.M. (1991). Development and testing of a model of consideration set composition. *Journal of Marketing Research, 28*(4), 429-440.

Sarwar, B., Karypis, G., Konstan, J. A., & Riedl, J. (2001). Item-based collaborative filtering recommendation algorithms. In Proceedings of the 10th International Conference on World Wide Web, WWW 2001 (pp. 285-295). (WWW '01). New York, NY, USA: Association for Computing Machinery, Inc. doi:10.1145/371920.372071

Senecala, S., & Nantel, J. (2004). The influence of online product recommendations on consumers' online choices. *Journal of Retailing, 80*, 159–169. doi:10.1016/j.jretai.2004.04.001

Shang, Q., Pei, G., & Jing, J. (2017) My friends have a word for it: Event-related potentials evidence of how social risk inhibits purchase intention. *Neuroscience Letters, 640*, 70-75. doi:10.1016/j.neulet.2017.02.023

Shocker, A.D., Ben-Akiva, M., Boccara, B., & Nedungadi, P. (1991). Consideration set influences on consumer decision-making and choice: Issues, models, and suggestions. *Marketing Letters, 2*(3), 181-197.

Showkat, N., & Parveen, H. (2017). Non-probability and probability sampling. *E-PG Pathshala*, 1-9. Retrieved from https://www.researchgate.net/

Shukla, P. (2010). Impact of interpersonal influences, brand origin and brand image on luxury purchase intentions: Measuring inter-functional interactions and a cross-national comparison. *Journal of World Business, 46*, 242–252. doi:10.1016/j.jwb.2010.11.002

Statista (2019). *Brand value of the 25 most valuable brands in 2019 (in million U.S. dollars).* Retrieved from https://www.statista.com/

Statista (2019). *Global advertising spending from 2010 to 2019 (in billion U.S. dollars).* Retrieved from https://www.statista.com/

Statista (2019). *Projected retail e-commerce GMV share of Amazon in the United States from 2016 to 2021.* Retrieved from https://www.statista.com/

Statista (2019). *Retail e-commerce sales worldwide from 2014 to 2021 (in billion U.S. dollars).* Retrieved from https://www.statista.com/

Symeonidis, P., Ntempos, D., & Manolopoulos, Y. (2014). *Recommender systems for location-based social networks.* New York: Springer-Verlag. doi:10.1007/978-1-4939-0286-6

Tam, K.Y., & Ho, S.Y. (2005). Web Personalization as a persuasion strategy: An Elaboration Likelihood Model perspective. *Information Systems Research, 16*(3), 271-291. doi:10.1287/isre.1050.0058

Tutaj, K., & Reijmersdal, E.A. Effects of online advertising format and persuasion knowledge on audience reaction. *Journal of Marketing Communications 18*(1), 5-18. doi: 10.1080/13527266.2011.620765

Vroomen, B., Franses, P.H., & Nierop, E. (2004). Modeling consideration sets and brand choice using artificial neural networks. *European Journal of Operational Research, 154*, 206-217.

Wright, K.B. (2017). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication, 10*(3). doi:10.1111/j.1083-6101.2005.tb00259.x

Yang, S.F. (2015). An eye-tracking study of the Elaboration Likelihood Model in online shopping. *Electronic Commerce Research and Applications, 14*, 233–240. doi:10.1016/j.elerap.2014.11.007

7. APPENDIX - Survey

Hi there, dear participant! My name is Mihael Gelo.
As a student of Media studies on the Erasmus University of Rotterdam in The Netherlands, I'm doing a research project about Amazon's recommendations and their influence on purchase decisions.
Recommendations appear on Amazon's website as information about products that could be potentially interesting to the users based on their previous activity (search, purchases, ratings and likes) as well as the activity of other users.
The data from your answers will be kept confidential and used ONLY FOR THE PURPOSES OF MY MASTER THESIS.

This survey should last 5-8 minutes. While I would really appreciate you reaching the end of the questionnaire (so that your response counts as legitimate), bear in mind that you can leave this survey at any point.
By filling in this questionnaire you're helping me get my masters' degree, therefore I'm very thankful for your time :)
For any questions you might have, feel free to contact me via email: 512149mg@student.eur.nl
Before we start, please tick the following box to give your consent to participate.

To start, I would like to determine whether you are an active customer of Amazon e-commerce service. Did you use Amazon to purchase something within the last six months?
Yes
No

Do you have your own account on Amazon?
Yes
No

Approximately, how many times did you purchase something through Amazon in the last six months?

1 - 5 times

6 - 10 times

11- 20 times

More than 20 times

How old are you? (Please input the number that corresponds to your age)

_____

What is your gender?

Male

Female

Other

Prefer not to say

What is your nationality?

Choose from the list of countries

In which country do you currently reside?

Choose from the list of countries

In the following questions, please indicate how strongly you disagree or agree with each of the following statements by placing a check mark in one of the spaces on the scale.

Advertising is reliable source of information about the quality and performance of products

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

Ads give me essential information about products

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

Brand messages on social media give me essential information about products

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

Most advertising is intended to deceive rather than to inform

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

Most advertising makes false claims

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I use brands that my family buys or has bought in the past

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I feel more comfortable buying a product when people have given me their opinions on it

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I seek advice from my friends on which products I should buy

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

The online reviews submitted from strangers affect whether I will buy a certain product or not

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

In the following questions, please indicate how strongly you disagree or agree with each of the following statements by placing a check mark in one of the spaces on the scale.

I'm willing to make an extra effort to find lower prices

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I always check alternatives on Amazon.com to be sure I get the best value for money I spend

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I am more likely to buy products that are on the discounts

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

It is important for me to be aware of all the alternatives before buying an expensive item

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I follow recommendations on Amazon when purchasing a product

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

Amazon's recommendations work well in determining which products I may like

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree
Strongly agree

Amazon's recommendations affect my purchase choice
Strongly Disagree
Disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Agree
Strongly agree

I am more likely to follow the first result/recommendation of Amazon rather than second or third
Strongly Disagree
Disagree
Somewhat disagree
Neither agree nor disagree
Somewhat agree
Agree
Strongly agree

Before our decision to buy a certain product, we're all influenced by certain factors. Please try to think about how the following ones affect you and then rank them from 1 to 5. (1 being the factor that influences your purchase choice the most)

Amazon's recommendations
Family/friends
Online reviews of products
Marketing (brands' messages, advertisements etc.)
Value (price-quality ratio) of products

You're near the end of the survey.

In the following questions, please indicate how strongly you disagree or agree with each of the following statements by placing a check mark in one of the spaces on the scale.

I understand how Amazon makes recommendations

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I'm aware that Amazon uses recommendations as means to sell more products

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I can see through sales tricks used by Amazon to get consumers to buy certain products

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

When seeing a recommendation for the product on Amazon, I try to evaluate why Amazon would think that this product is suitable for me

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

The fact that the recommendations on Amazon are personalized for me makes me think they are legitimate

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I don't give too much thought about the logic behind Amazon's recommendations

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

I often wonder about the logic behind the order of recommendations that appear on the Amazon

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

*The order in which Amazon's recommendations appear on the website is legitimate because it was made to suite me personall*y

Strongly Disagree

Disagree

Somewhat disagree

Neither agree nor disagree

Somewhat agree

Agree

Strongly agree

Finally, before finishing the questionnaire, I'd like you to indicate which categories of products did you purchase on Amazon in the last six months.

(Choose as many options as applicable)

Media products (books, CD's, DVD's, software)

Consumer electronics

Clothing

Beauty products

Food and groceries

Health and personal care items

Industrial and scientific supplies

Kitchen items

Jewelry / Watches

Lawn and garden items

Musical instruments

Sporting goods

Tools

Automotive items

Toys and games

---None of the above---