

Protection of digital privacy

Consumer's perception and behaviour regarding online personal data



Master thesis

S.R. Bhoendie

321252

September 29, 2016

Erasmus University Rotterdam

Erasmus School of Economics

Economics and Business:

Marketing

Table of Contents

Abstract.....	4
Keywords	4
1. Introduction.....	5
1.1 Motivation	5
1.2 Research question	6
1.3 Theory foundation	6
1.4 Paper lay-out	6
2. Conceptual development: the research model and hypotheses.....	7
2.1 The privacy paradox	7
2.2 Product trust	12
2.3 Procedural fairness	13
2.4 Risk preference.....	14
2.5 (Product/Service) Customization.....	15
2.6 Rewards	17
2.7 Perceived uncertainty	18
2.8 Perceived benefits	20
3. Implementation.....	22
3.1 Table of constructs.....	22
3.2 Context	22
3.3 Survey Design	22
4. Empirical Execution	24
4.1 Descriptive Statistics.....	24
4.1.1 Demographics.....	24
4.1.2 Central tendency and variability	24
4.1.3 Validity	25
4.2 Correlation Analysis	26
4.3 Hypothesis testing.....	27
5. Results	31
5.1 Ordinal regression.....	31
5.2 Relationship product trust on perceived uncertainty and willingness to share	35
5.3 Relationship risk preference on perceived uncertainty and willingness to share.....	36
5.4 Relationship procedural fairness on perceived uncertainty and willingness to share ...	36
5.5 Relationship customization on perceived benefits and willingness to share	36

5.6 Relationship rewards on perceived benefits and willingness to share	36
5.7 Relationship perceived uncertainty on willingness to share	37
5.8 Relationship perceived benefits on willingness to share	37
5.9 Mediating effects	37
6. Conclusion	39
6.1 General Conclusion	39
6.2 Managerial implications	40
References	41
Appendix	48

Abstract

The main purpose of this thesis is to identify factors influencing customer's attitudes towards sharing personal information online. The established literature about privacy mentions the privacy calculus as an important theory regarding customer's willingness to share. This theory maintains that the perceived benefits should be of greater value than the perceived uncertainty. Building upon this theory, a conceptual model was built on the trade-off between consumer's perceived uncertainty and perceived benefits in sharing their private information. Antecedents of these two factors, such as product trust, risk preference, procedural fairness, customization and rewards were acknowledged by extensive literature review as their antecedents. The main results of this research are as follows. Risk preference and procedural fairness are respectively internal and external factors that impacts customer's perception when deciding to share personal information. Accordingly, customization and rewards are also found to influence customer's perception of sharing personal information. Another important observation that while perceived uncertainty was shown to impact willingness to share significantly, perceived benefits did not. As a result, the privacy calculus could not be established within the model. Partial mediating effects were found as well for perceived uncertainty, which shows that relationship between risk preference and willingness to share can be explained to a degree by perceived uncertainty.

Keywords

Digital privacy, online, information sharing, personal, customization, risk, uncertainty, rewards

1. Introduction

1.1 Motivation

Digital privacy is currently a much discussed topic in modern society of advanced technology. First of all, gaining personal data from customer has become an indispensable tool for economic transactions. In marketing, current systems such as CRM (Customer Relationship Management) make it possible to provide customized products or service to satisfy individual customer's wants and needs. To enable this, individual customer data needs to be collected for consumer segmenting and targeting. (Peppers & Rogers, 1997; Ferguson, 2000). Secondly, personal information from customers can enrich customer-firm relationships, which firms are eager to attain as this will lead to higher customer retention, loyalty and return-on-investments (Phelps, Nowak & Ferrell, 2000). However, despite of all the aforementioned benefits, collecting personal information does raise concerns among customers as most of the time they have no sight on the when, where and how their personal information is being handled once it is given away (Malholtra, Kim & Agarwal, 2004). Boyd (2010) has written about present-day networked individuals and she stated: "in networked publics, interactions are often public by default and private by effort". A recent example has been the WhatsApp update in August 2016, where account information can be shared with Facebook for ad targeting (Fox-Brewster, 2016). WhatsApp is a popular app for the smartphone that can be used to send chat messages and was acquired in 2014 by Facebook at \$19 billion dollars. This means that new privacy policies has been added to WhatsApp and that the sharing function has been automatically turned on in the app settings without any pop-up to inform the users. This leads to unaware WhatsApp customers sharing their private information. While these practices might seem improper, they are still legal procedures (Regidi, 2016).

Another example that shows how digital privacy has raised concerns among customers is when whistle blower Edward Snowden publicly leaked documents about how the Central Intelligence Agency (CIA) and similar agencies in other countries have access to individuals' chat logs, personal data, mobile network and shared and social media content for espionage purposes (Kleinman, 2013). While this is not the focus of this paper, customer's awareness on privacy has increased. A poll conducted by PEW Research Center in late 2014 after the Snowden affaire has shown that up to 91% of respondents 18 years and older agree to strongly agree with the notion that they have lost control over how personal information is collected and used by companies. However, in commercial settings this risk is also weighed against benefits, as a majority of people mention that they would like to share some of their personal information with a company in order to make full usage of online services (Rainie, 2015).

It would therefore be interesting to acknowledge this phenomenon from the customer's point of view as there are both perceived benefits and risks accompanied with personal information sharing. In literature, there is extensive research about the privacy paradox, privacy concerns, customization and risk in the online environment. However there is not much known about how perceived benefits and perceived uncertainty of personal information in the online environment affects customer's willingness to share private data. This thesis will try to bridge this gap by discerning relationships between antecedents of perceived uncertainty and benefits and ascertain whether and how they can influence customer's disposition towards sharing their personal information

1.2 Research question

The research question of this paper is as follows:

"What factors influence customer's willingness to share personal information online and what is the underlying mechanism?"

1.3 Theory foundation

The main theory that applies to the research is the privacy calculus, which essentially explains that benefits (i.e. customization) from handing in personal information should overwhelm the costs associated with information sharing (i.e. privacy concerns) for rational agents to trade personal information (Laufer & Wolfe, 1977; Milne & Gordon, 1993; Stone & Stone, 1990). Also, theories regarding customer's attitude and (risk) perception are important when regarding customer's persuasion towards personal information sharing.

1.4 Paper lay-out

The layout of the paper is arranged as follows. The theoretical framework of the paper is established in Section 2, where the corresponding hypotheses are formed as well. Then, in Section 3, the implementation of the research will be laid-out. Section 4 explains the empirical execution and mainly describe the statistics of the data. In Section 5 the results will be discussed and explained with aid from the performed tests and Section 6, also the last section, will consist of the final conclusion and managerial implications.

2. Conceptual development: the research model and hypotheses

2.1 The privacy paradox

The main purpose of this research is to establish the factors that influence customer's perception regarding private information sharing. As customers are now becoming more competent with e-commerce (i.e. transacting via the Internet), there are consequently also more opportunities for firms to increase business and customer relationships by collecting customer's personal data (Phelps, Nowak & Ferrell, 2000). This raises considerable privacy concerns among customers as most of them do not know how the information is handled once it is given away (Malhotra, Kim & Agarwal, 2004). In this thesis, the customer's privacy definition in relation to personal information sharing in an online setting is maintained as "the individual right of humans to determine, when, how, and to what extent information is collected about them during the course of the digital business transaction; the right to be aware and to control the beginning of any interaction or data gathering process; and the right to choose when, how, and to what extent their personal information is made available to others" (Katsikas, Lopez & Pernul, 2005, p.6). While privacy is greatly valued among customers, there are some inconsistencies noticeable regarding privacy attitudes and actual behaviour (Spiekermann, Grossklags & Berendt, 2001). This phenomenon is also known as the privacy paradox, meaning that in spite of privacy concerns among individuals, people are still willing to give up personal information in exchange for small, short-term benefits and are less likely to take extra precaution measurements for privacy protection (Acquisti & Grossklags, 2005). The underlying mechanism thereupon was established in previous (offline) research as the 'privacy calculus' (Laufer & Wolfe, 1977; Milne & Gordon, 1993; Stone & Stone, 1990) and is the trade-off between the benefits of sharing personal information (such as the degree of delivered personalization of product or service) against the costs, which is the utilization of "consumer privacy concerns, previous privacy invasion experience, and consumer-rated importance of information transparency and privacy policies" (Awad & Krishnan, 2006, p. 18). For example, Amazon.com offers potential benefits based on personalization, such as anniversary date reminders and customized options for merchandise (Chellappa & Sin, 2005). One potential risk when giving out personal data includes fraud and mainly identity theft. Ideally, the individual's perceived benefits of sharing personal information should be valued greater than the perceived costs to positively affect customer's willingness to share personal information to second and third parties. Applying this to the utility maximization theory, which assumes consumers to be rational agents who will always choose the best possible alternative based on their preferences (Aleskerov, Bouyssou & Monjardet, 2007), the derived consumer utility function would then be:

$$U(X)=Benefit - Cost$$

As mentioned before, the benefit derived from personal data sharing is the delivered personalization and the cost is a function of multiple factors regarding privacy concerns.

Hoffman, Novak and Peralta (1999) have shown that factors such as acknowledging customer's data ownership rights, providing clear opt-in and opt-out policies concerning information exchange will positively affect customer's willingness to share personal information. These factors are part of procedural fairness, as they enable customers to have transparency and control in the treatment of their personal data by other parties. Procedural fairness is common within privacy literature, considering its strong influence on customer's attitude towards personal information sharing. Extensive research has shown that clear communication about private information being handled in a fair and secure way, will increase customer's willingness to allow collection of their personal data (Culnan & Armstrong, 1999). Procedural fairness is therefore used as a variable in the conceptual model, as it is a dominant factor that influences customer's perception towards (personal) information sharing.

Parallel to procedural fairness, there is another inherent factor that maintains a meaningful role in consumer's willingness to share: (product/service) trust. Trust is an important determinant of risk, as studies have shown that having trust in the product/service/brand increases information sharing, establishes new affiliations and ensures worthwhile communication (Fukuyama, 1995; Lewis & Weigert, 1985; Dwyer, Hiltz & Passerini, 2007). Similar to the privacy calculus, there is also a trade-off relationship discernible in risk between benefits and costs, with trust as base condition. In other words, the more trust a person has in the product, the less perceived risk (i.e. lower perceived costs) he derives from sharing his personal information (Metzger, 2004). The strong influencing role of trust causes it to be an important driver of consumer behaviour and therefore determines this variable as an important factor, which is used in the conceptual model as an antecedent of perceived uncertainty.

As mentioned before, the factor risk is always involved when measuring perceived uncertainty. In the context of customer's willingness to share personal data, the individual's risk preference is an essential determinant that has to be assessed. The risk preference of an individual is either risk-seeking or risk-averse according to the prospect theory by Kahneman and Tversky (1979). This choice model shows the trade-off between benefit and cost, where in uncertain situations (e.g. gambling), the benefit is the potential gain (i.e. winning money) an individual derives and cost is the potential loss (i.e. losing money) the individual can expect within the situation. In general, for risk-seeking individuals the potential gains outweigh the potential losses, while risk-averse individuals would rather not have any potential loss and therefore favour not losing at all over any potential gains. It is thus important to note that models

of risk taking under uncertainty are highly influenced by people's attitude towards risk itself (Zaleskiewicz, 2001). This infers that there are different mechanisms underlying people's attitude towards risk such as their individual features or personality traits and their own inclination towards security or acquisition (Lopes, 1987). For example, people who desire safety will most likely be risk-averse, while others might be more ambitious and wish to gain as much as possible, making them more risk-seeking individuals. As sharing of personal information is subject to uncertainty as well and the main conceptual model portrays customer's disposition towards personal information sharing, individual risk preference is an important determinant to detect people's attitude towards risk and how this might influence their willingness to share.

Procedural fairness, (product/service) trust and risk preference are found to be the three most notable factors within literature regarding privacy issues, with regards to the customer's viewing point and are therefore used as the antecedents which measure perceived uncertainty. During the review of additional literature, more factors can be distinguished which can influence perceived uncertainty, such as customer's satisfaction and perceived quality (Reimann, Lünemann, & Chase, 2008). However, it is possible to trace these factors back to each mentioned antecedent in the model. For example, customer's satisfaction and perceived quality can be related to trust and procedural fairness, as they are closely associated in the sense that trust and procedural fairness can lead to satisfaction and higher quality perception.

In addition to perceived uncertainty, there are also the perceived benefits that individuals enjoy when contributing their personal information. For example, personalization and customization of product and services has a positive influence on individuals' personal information sharing as these enhance customer's experience (Mittal & Lassar, 1996). Kobsa and Teltzrow (2004) found that communicating and showing personal benefits online will lead to increased customer's willingness to hand over their private data (Hann, Hui, Lee & Png, 2002). For instance, when a person makes an account on a shopping website (e.g. Amazon.com), their personal preferences are immediately incorporated into their account, which can lead to website lay-out changes to personal taste, or showing recommended offers. This is generally done for customer's convenience, efficiency and experience and is often obliged (Hui, Tan & Goh, 2006). Therefore, personalization, also known as (product/service) customization, is an indispensable variable regarding perceived benefits, particularly in the online context as the growth of e-commerce enables them offer their products and services through the Web as well. More importantly, the Web provides customers with more choices enabling variety and customization within products/services instead of traditional mass produced standardized products/services (Schafer, Konstan & Riedl, 2001).

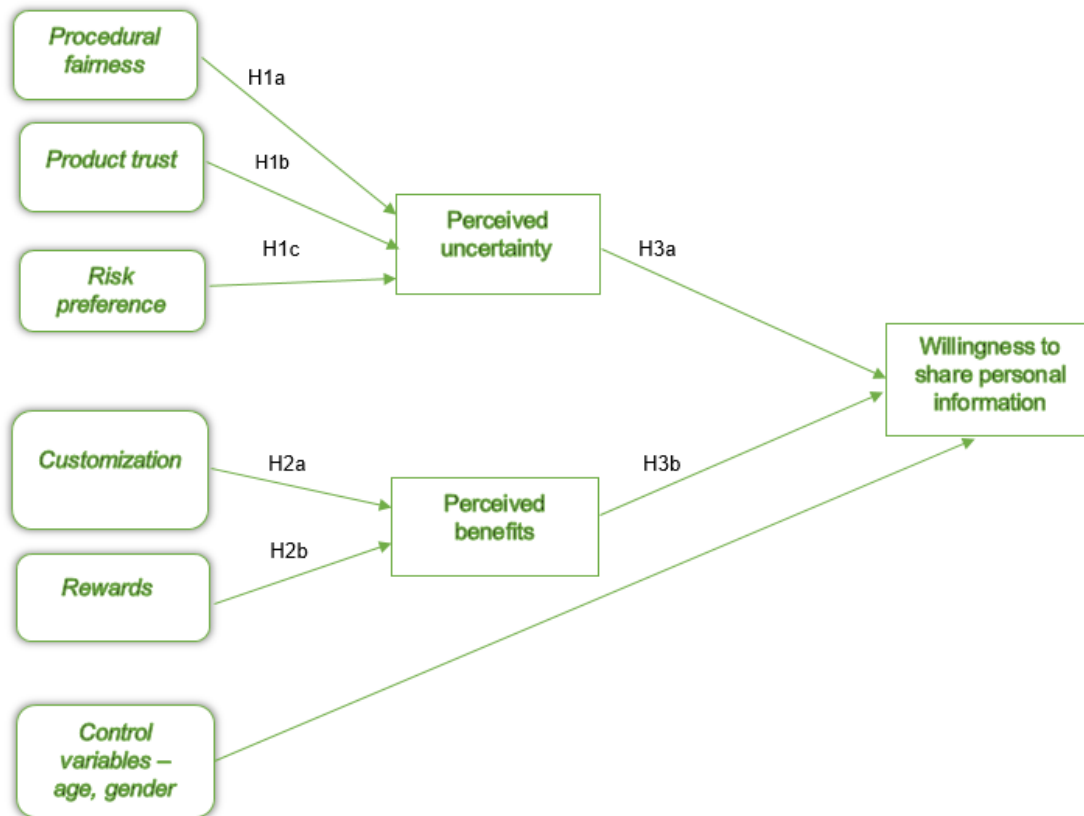
Another possible benefit people gain from sharing their personal information is the prospect of a reward. As mentioned before in the privacy paradox, people are willing to share their personal information in exchange for relatively small rewards, such as money or convenience (Hann, Hui, Lee & Png, 2007). This is inconsistent with the notion of customers being rational agents and choosing the best alternative which will maximize their utility (Awad & Krishnan, 2006). Acquisti (2004) argues that people are not always rational agents as there are certain factors that negatively influence rationality and therefore causes a discrepancy between behaviour and attitude. While there has been extensive literature stating that rewards can influence an individual's willingness to share personal data, there is also known literature that states otherwise (Andrade, Kaltcheva & Weitz, 2002). As stated by Andrade et al. (2002), the offer of a reward is acknowledged as either not adequate enough compensation or as a suspicious "bait" that subtracts their personal information. It is therefore interesting to acknowledge whether the variable reward has a positive or negative impact in this particular conceptual model, because of the opposing views within literature.

Correspondingly, two antecedents are used to describe perceived benefits within the conceptual model: Product/service customization and rewards. There are other perceived benefits mentioned in research such as convenience, efficiency and switching costs, nonetheless these factors are similar to customization or rewards, as convenience and efficiency can be rewarding to the customer and lower searching costs can be established in terms of customization options (Hui, Tan & Goh, 2006). As a result of this similarity, the decision is made to use only these two antecedents as explaining variables for perceived benefits.

As willingness to share private information is the dependent variable, the conceptual model is developed of antecedents that are inherent to perceived uncertainty and benefits, which in turn will explain customer's willingness towards sharing their personal data.

Based on the literature review and the derived hypotheses, the following conceptual model is developed (**Figure 1**).

Figure 1: Conceptual model



The relationships between tested variables are between (a) the antecedents and independent variables – product trust, procedural fairness, risk preference on perceived uncertainty and customization, rewards on perceived benefits – (b) the antecedents on the dependent variables – product trust, procedural fairness, risk preference, customization and rewards on willingness to share – (c) the independent variables on the dependent variables – perceived uncertainty and perceived benefits on willingness to share – and lastly (d) all variables included into one model to find mediating effects. The main findings will include whether the derived hypotheses are supported or not and the expectation is to find mediating effects, as the mentioned variables are considered to impact each other.

In the following sections each of these antecedents of the used descriptors (i.e. perceived uncertainty and perceived benefits) is explained in more detail.

2.2 Product trust

Trust is essentially about one party (i.e. trustor) depending on the other party (i.e. trustee) to take important actions on their behalf, without any interference in the form of monitoring and controlling that other party (Mayer, Davis & Schoorman, 1995). Particularly in an online context, trust is an important factor for vendors, as customers have to deal with a lot more uncertainty, dependency and risk in the environment (Kautoten & Karjaluoto, 2008). It is therefore important to notice that trust has an integrated role in online transactions, because this ensures customers' confidence and influences whether they entrust their personal information to another entity (i.e. firm), without having full knowledge of the consequences (Katsikas, Lopez & Pernul, 2005). In other words, trust serves as a mediator between parties to eventually decrease transactional uncertainty (Bstieler, 2005). However, trust is not always warranted, as the Internet is a place with numerous hidden threats (e.g. hackers), which causes customers to find it challenging to grant or earn trust. For example, in case of providing sensitive information within the internet banking context, people are hesitant to give out banking or insurance information because of existing online threats potentially stealing their information (Suh & Han, 2000). When specifically mentioning product trust, the definition used for this thesis is by Reid, Pullins and Plank (1999) and described as the notion that the product or service will fulfil its purpose as acknowledged by the customer. This assumes, as mentioned earlier by Bstieler (2005), that when customers believe they can trust the product, this will reduce their perceived uncertainty in the transactional environment.

The company's reputation is also an important factor that affects product trust. In online services for instance, information asymmetry is a recurrent dispute as the consumer cannot physically utilize the product/service, hence is placed in a liable situation. Opposed to this, the service provider knows what it is getting (i.e. money) and is ultimately in a less risky situation.

Therefore, it can be assumed that when customers have trust in the product or reputation of the firm, they are more willing to relinquish control and dependency. As a consequence, product trust brings about more reassurance for the customer (i.e. trustor) in terms of reliability and integrity of the firm (i.e. trustee) (Morgan & Hunt, 1994) and thus, decreases perceived uncertainty. Following this, the derivation is that trust serves as a precedent for perceived uncertainty and that it reduces the degree of uncertainty. Consequently, the first hypothesis is as follows:

H1a) Increased consumer trust in the product leads to reduced perceived uncertainty

Product trust is one of the factors of perceived uncertainty chosen in the conceptual model. Similar to trust, procedural fairness is also a factor of perceived uncertainty that influences the

reliability and integrity of the firm. The relation of trust and procedural fairness is therefore parallel and works in the same direction regarding perceived uncertainty, as explained thoroughly in the following paragraph.

2.3 Procedural fairness

Procedural fairness is about an entity, such as a firm, engaging in fair information sharing procedures and communicating in a transparent manner to the customer (Culnan & Armstrong, 1999). Van den Bos, Wilke and Lind (1998) found that the degree of trustworthiness of an entity is determinative for the customer's need of procedural fairness information, which means that the more trust the customer has in an organization, the less of a need he has for procedural fairness information. This explains the parallel relationship and the same direction trust and procedural fairness adhere with respect to perceived uncertainty, which is mentioned in the previous paragraph. Leventhal (1976) describes each condition that should be met when establishing procedural fairness: first the collected information should be complete and susceptible to additional information and influence from the customer's perspective, second the usage of information should be handled responsibly by the decision-maker and third customers should have a considerable amount of influence over the outcome of this information. Subsequently this means that customers are not against unfavourable outcomes per se, but do however expect to have a voice in the procedure where they have a central role.

Customers value apologies in case of an unfavourable outcome as well, which leads to the assumption that if an organization makes a mistake and apologizes for it, customers' positive perception of procedural fairness is still maintained (Goodwin & Ross, 1992). The valuable role of procedural fairness is understood by organizations as well, albeit it can sometimes be misused as an "impression management strategy" (De Cremer & Tyler, 2007), which means that despite the decision-maker's supposed agreeance to customer interference throughout the process, in reality the decision-maker follows its own interest independently from customer's voice. When this is the case, procedural fairness is not seen as meaningful and therefore will not drive customer's behaviour towards personal information exchange. Nevertheless, when procedural fairness does have a meaningful role, it is a crucial factor in deciding customer's attitude towards cooperating with another entity.

Procedural fairness is thus about the conducted approach of asking private information. When this is done in a safe, responsible and transparent manner, customers are more likely to adjust their perception of uncertainty in a positive way. Procedural fairness has a parallel relationship to product trust and is thus also an antecedent. Therefore we can establish the following hypothesis:

H1b) Increased procedural fairness leads to a decrease in perceived uncertainty

Both trust and procedural fairness can lead to positive effects regarding perceived uncertainty. However, uncertainty cannot be measured without establishing the individual's risk perception. In the following paragraph risk perception and risk preference, will be explained further.

2.4 Risk preference

Risk is an important factor that influences the customer's choice. In general, economic behaviour can be predicted by assessing a customer's disposition towards risk (Dohmen, Huffman, Schupp, Falk, Sunde & Wagner, 2011). Risk preference is about an individual's assessment of the potential benefits of a particular event against its costs. Risk preference measurement takes into account risk perception as well, which is about one's perception regarding the uncertainty and negative effects of a particular event (Bentlin, Slovic, & Sevenson, 1993). The prospect theory is here fundamental as it states that the choices made in an event with high risk and uncertainty (e.g. gambling) are highly relative and circumstantial, where guarantees outweigh probabilities (Kahneman & Tversky, 1979). Hence, based on situations where perceived uncertainty is high, there are two types of people that can be distinguished: risk-seeking and risk-averse individuals.

The difference between a risk-seeking and risk-averse individual can be explained by the expected utility theory with a simplistic gamble example (Kahneman & Tversky, 1979). As an example, there is a gambling opportunity in which the individual has two choices:

- A. 50/50 chance to win \$1,000 or \$0
- B. Win \$450 for sure

According to the expected utility theory, for risk-seeking individuals the potential benefits should outweigh the costs. In this example it is seen that choice A has an expected net income of \$500 while choice B has an expected net income of \$450. As $500 > 450$, one can safely assume that the risk-seeking individual will go for choice A. Opposed to this, the risk-averse customers will be more inclined to choose certainty and therefore pick choice B. This is simplistic example of the prospect theory as there are conditions possible where the expected utility theory is violated. However, it does show the basic assumption enough to distinguish between risk-seeking vs risk-averse individuals.

Whether a person is risk-seeking or risk-averse is also dependent on demographics such as gender, age, height and parental heritage (Dohmen et al., 2011) Gardner and Steinberg (2005) are one of the many researchers who have shown that there is a distinction in risk-

taking behaviour across different age-groups. They have established that adolescents are more likely to engage in risk-seeking behaviour than their older counterparts (i.e. adults) because they are in general more vulnerable towards peer pressure. Other literature focuses on the role of gender in risk preference. Byrnes, Miller and Schaffer (1999) have done an extensive review by doing a meta-analysis of 150 studies comparing the role of gender in different types of risky circumstances. The main evidence within the studies are unanimous and show that men are more inclined to engage in risk-seeking behaviour than women. The most probable underlying motivation for this comes from an evolutionary perspective, where males could have multiple partners without much attachment, while the women were much more attached due to having to bear children and taking care of them (Wilson & Daly, 1985). Men also have higher testosterone levels, which makes them more likely to have sensation-seeking personality traits and more inclined to take risks (Zuckerman, Eysenck & Eysenck, 1978; Arnett, 1994).

When measuring risk preference, acknowledging whether a person is risk-seeking or risk-averse is often not enough information because their behaviour depends on the context. In general however, risk-seeking individuals will adapt better to situations with high perceived risks and risk-averse individuals will adapt better to situations with low perceived risk.

Summarizing, significant literature has shown the differences between risk-seeking and risk-averse individuals. The derivation is therefore that the more risk-seeking a person is, the more likely he would be willing to take risks in uncertain situations and vice versa for a risk-averse person. Whether a person is risk-seeking or risk-averse is important when measuring their disposition towards perceived uncertainty and is therefore identified as an antecedent as well. Based on all this, we can establish the following hypothesis:

H1c) People who are more tolerant in risk are likely to have lower perceived uncertainty

Risk preference is the third and last antecedent regarding perceived uncertainty. Other factors or controlled variables which might influence perceived uncertainty are possible, but as mentioned in paragraph 2.1, these are the most notable factors found in privacy literature and therefore are used in the conceptual model.

2.5 (Product/Service) Customization

Personal information exchange is believed to be more plausible when certain benefits are received in return (Awad & Krishnan, 2006). One of these benefits is (product/service) customization and is described by Chellappa and Sin (2005, p.181) as “the ability to proactively tailor products and product purchasing experiences to tastes of individual consumers based upon their personal and preference information.” With customer profiling, a firm can establish

the wants and needs of a particular customer segment and match their products and services accordingly (Raghu, Kannan, Rao & Whinston, 2001). Prior research has already established how the Internet facilitates numerous customized offerings and communications (Alba, Lynch, Weitz, Janiszewski, Lutz, Sawyer & Wood, 1997). Customer Relationship Management (CRM) systems in particular enable organizations to discover, understand, sort and order data based on customer preferences, prior sales items and customer profile (Ferguson, 2000). Hence, new technologies online make it easier now for firms to accommodate to individual wants and needs with one-to-one marketing (Peppers & Rogers, 1997) without having the economical restraints (Ariely & Simonson, 2003) as before when mass production and customization was the norm. Important to note about one-to-one marketing is the difference between personalization and customization; personalization is firm-initiated and considers the marketing tactics delivered by the firm which are suitable for an individual customer based on their personal data, while customization, which is customer-centric, focuses on how the customer himself can have an influence on the delivered marketing tactics (Arora et al., 2008). Considering the research question of this thesis is customer-centric, customization is used as the explained variable in the conceptual model.

Recent research has also supported the notion that the option of online customization is valued by the customer by means of the derived enhanced convenience, experience and usage (Chellappa & Sin, 2005). In a corporal example, Adidas decided to launch a new product-line where customers could design their own Adidas shoes, which was an immense success and led to greater customer satisfaction (Berger & Piller, 2003). Furthermore, it was established that customers valued the co-designed shoes more than the standardized versions. Moreover, customization is a form of differentiation and ensures the uniqueness of the product or service at hand. Customization features are provided in different ways such as in choice modelling, where the customer can numerically rate each attribute based on importance after which algorithms can help customized recommendations being shown, which leads to a decrease in customer exertion and can lower their searching costs (Häubl, Dellaert, Murray & Trifts, 2004).

In short, customers appreciate customization as one-to-one marketing directly responds to their wants and needs and enables them to enjoy their (online) activities and experience. Customization is therefore an antecedent of perceived benefits. The fitting hypothesis will then be:

H2a) Customized product or service leads to increased perceived benefits

As mentioned before, customization is customer-centric and drives customer's behaviour because of its beneficial features. One factor that also stands out when discussing beneficial

drivers of customer's behaviour is the possibility of gaining or winning a reward in exchange for something. In the next paragraph, the option of having a reward is explained as being part of perceived benefits.

2.6 Rewards

As previously stated, the privacy paradox is repeatedly noticeable among customers (Spiekermann et al., 2001). Despite of growing privacy concerns with the growth of e-commerce, there has been evidence that customers are surprisingly willing to give up privacy for (future) convenience, or willing to exchange private information for relatively small (financial) rewards (Hann, Hui, Lee & Png, 2007; Acquisti, 2004). As Acquisti (2004) argued this most likely has to do with bounded rationality, incomplete information and immediate gratification, which can pose a significant influence on individuals causing them to act irrational, leading to a mismatch between behaviour and attitude. For example, empirical field studies have also shown that people are more likely to disclose personal information when they receive a monetary reward in compensation (Hui, Teo & Lee, 2007). In addition to this, acquiring promotional information (i.e. coupons) or receiving rewards that lead to personal innovativeness (e.g. attending free workshops) can also influence customer's propensity to share personal information (Xu, Luo, Carroll & Rosson, 2009). The underlying reason for this can be found in persuasion literature. Katz (1960) has established that consumer behaviour is motivated by goals, such as maximization of concrete rewards. This means that individuals are persuaded to take action when they picture a concrete reward in exchange. In the elaboration likelihood model (Petty & Cacioppo, 1984) there is a distinguished difference in the amount of effort people dedicate to processing messages. In the central route, people are more inclined to critically examine the situation at hand, thus are more likely to be sceptical when receiving a reward in return for personal information. In the peripheral route however, people are less motivated to critically assess the situation and focus exclusively on attractive cues (i.e. the prospect of a reward), which makes them more likely to accept the offer of a reward, without much thought. As personal data collection (and therefore privacy) is now an actual and popular topic in the online environment, it is feasible for most people to take the peripheral route as too much information and constant confrontation can lead to demotivation to think critically about the problem at hand. This could be a reason why relatively small rewards can precariously convince customers to share personal information. The central route is possible within customers as well, as suggested in other literature where gaining rewards in return for sharing private information is seen as "suspicious" and more of a forceful, blackmailing method to extract valuable information (Andrade, Kaltcheva & Weitz, 2002).

In other words, there is an apparent dichotomy within customers regarding the exchange of rewards for personal information. While some studies claim that there has been evidence that rewards will positively influence consumer behaviour, there have also been contrasting views. The main view however is that in spite of privacy concerns, customers often give up personal information in return for relatively small rewards, whether this is in the form of a discount, personal or financial matter. This is based on persuasion strategies where concrete rewards are goals that drive customer's behaviour. Rewards is therefore also an antecedent of perceived benefits. This leads to the following hypothesis:

H2b) Rewards lead to an increase in perceived benefits

These aforementioned five factors are all the identified antecedents occurring in the conceptual model. As stated, each of these are either part of customer's perceived uncertainty or perceived benefits. In the following paragraphs these independent variables will be shown as having a relationship towards willingness to share personal information.

2.7 Perceived uncertainty

In this particular context about sharing private information, perceived uncertainty is the customer's perception about the likelihood of harmful things that can happen once personal information is provided. There are different dimensions of perceived uncertainty (see **Figure 2**): physical risk, social risk, performance risk, financial risk, time risk, psychological risk, overall risk and privacy risk (Cunningham, 1967; Featherman & Pavlou, 2003).

In the context of sharing personal information, the common measurement of uncertainty would be privacy risk, which is "potential loss of control over personal information, such as when information about you is used without your knowledge or permission" (Feathermann & Pavlou, 2003, p. 455). However, since perceived uncertainty is a multidimensional construct, each dimension has an equal chance of influencing the adoption process. Trade-offs are also possible within these dimensions, for example purchasing a Tesla car probably leads to a decrease in performance risk (i.e. self-driving abilities) and social risk (i.e. enhanced status) but can also increase financial risk (i.e. purchasing the Tesla brand is a heavy financial investment) and privacy risk (i.e. usage of personal information to adjust car options).

Figure 2: Dimensions of Perceived Risk (uncertainty)

Description and definition of perceived risk facets	
Perceived Risk Facet	Description—Definition
1. Performance risk	“The possibility of the product malfunctioning and not performing as it was designed and advertised and therefore failing to deliver the desired benefits.” (Grewal et al., 1994)
2. Financial risk	“The potential monetary outlay associated with the initial purchase price as well as the subsequent maintenance cost of the product” (Grewal et al., 1994). The current financial services research context expands this facet to include the recurring potential for financial loss due to fraud.
3. Time risk	Consumers may lose time when making a bad purchasing decision by wasting time researching and making the purchase, learning how to use a product or service only to have to replace it if it does not perform to expectations.
4. Psychological risk	The risk that the selection or performance of the producer will have a negative effect on the consumer’s peace of mind or self-perception (Mitchell, 1992). Potential loss of self-esteem (ego loss) from the frustration of not achieving a buying goal.
5. Social risk	Potential loss of status in one’s social group as a result of adopting a product or service, looking foolish or untrendy.
6. Privacy risk	Potential loss of control over personal information, such as when information about you is used without your knowledge or permission. The extreme case is where a consumer is “spoofed” meaning a criminal uses their identity to perform fraudulent transactions.
7. Overall risk	A general measure of perceived risk when all criteria are evaluated together.

In online settings however, the degree of uncertainty is dependent on the extent of customer’s (online) privacy concerns. Perceived uncertainty arises when the decision-making environment creates customer’s feelings of discomfort, anxiety and concern (Zaltman & Wallendorf, 1983; Taylor, 1974, Engel, Blackwell & Miniard, 1986). In addition to that, online services often come across information asymmetry as the consumer cannot physically utilize the product/service, hence is placed in a liable situation (Dwyer, Hiltz and Passerini, 2007). Research has shown that most online customers want to protect their ‘information privacy’, meaning that they want to control “how, when, and to what extent information about the self will be released to another person (Westin, 1967) or to an organization” (Buchanan & Joinson, 2007, p.157). Demographic differences are also noticeable when it comes to privacy concerns. Comparatively, younger adults are more pragmatic about handing in their private information, while adults over 45 years are either highly concerned or not in the least concerned about their privacy (Sheehan, 2002).

When customers are not in control and depend on others to handle their private information, they are exposed to uncertainty which makes them less likely to be willing to give out their personal data. However, when the antecedents of perceived uncertainty – product trust, procedural fairness, risk preference – are such that they have a decreasing influence on perceived uncertainty, this will ultimately lead to customers being more open to private

information sharing. As perceived uncertainty serves as a predictor for willingness to share personal information, the hypothesis is:

H3a) Increased perceived uncertainty leads to a decrease in willingness to share personal information

Lastly, perceived benefits is one of the descriptors suggested to have a positive influence on willingness to share information. In the next paragraph this will be explained further.

2.8 Perceived benefits

Perceived benefits determines the likelihood that customers believe they will gain a better service/experience/product online when they choose to share their personal information. Chellappa and Sin (2005) show how customization can positively influence the customer's willingness to share personal information. This positive influence is derived from the customer's viewpoint where five perceived benefits that mass customization offers are identified: utilitarian value, uniqueness value and self-expressive value are about the product assessment and hedonic value and creative achievement value are about the process assessment (Merle, Chandon, Roux & Alizon, 2010). **Figure 3** (Merle et. al. 2010) gives a complete overview of each of these values.

Figure 3: Perceived benefits of mass customization definitions

Perceived benefit	Definition
Mass-customized product value	
Utilitarian value	Value acquired from the closeness of fit between product characteristics and individual preferences
Uniqueness value	Value acquired from the opportunity to assert personal uniqueness using the customized product
Self-expressiveness value	Value derived from the opportunity to possess a product that is a reflection of personality
Codesign process value*	
Hedonic value	Value acquired from the experience's capacity to meet needs related to enjoyment, fun, or pleasure
Creative achievement value	Value acquired from the feeling of accomplishment related to the creative task of codesigning

*For mass customization strategies that imply an elicitation process using a configuration tool.

It is imperative to realise that not only perceived benefits will decide whether a customer will share information, considering both perceived benefits and perceived uncertainty are subject to trade-off mechanisms, as explained in the privacy paradox (see paragraph 2.1). In other words, while each of the individual variable are suggested to influence the willingness to share personal information, the benefits should still outweigh the costs. In other words,

perceived benefits should be of greater value to customers than the reduction of their perceived uncertainty (Laufer & Wolfe, 1977; Milne & Gordon, 1993; Stone & Stone, 1990). As stated afore, customers derive value from good management of their personal information such as when it is used to enhance customer's online experience and when customized services are tailored to individual preferences (Sutanto, Palme, Tang & Phang, 2013).

As a result of the proposition that benefits gained – such as customization and rewards – will motivate customers to share their personal information, it is suggested that perceived benefits serves as an predictor for willingness to share personal information. The next hypothesis is therefore easily derived:

H3b) Perceived benefits will lead to an increase in willingness to share personal information

This is also the last hypothesis that will be tested. In the following part 3, the methodology and implementation of the conceptual model will be performed.

3. Implementation

3.1 Table of constructs

The measurement for the variables within the conceptual model are done on different scales, based on findings in literature sources. **Table 1** in the **Appendix** gives an overview of each construct, the items that will measure the construct, the scale, source and variable type. In the adjusted version, shown in **Table 2** of the **Appendix**, the scale changes are provided that were made in the survey.

3.2 Context

As most of the expected respondents will be students, the survey is based on a scenario that is applicable to students. On the other hand, it should not be too student-specific, as that will exclude other respondents. Housing property is a well-defined subject that is applicable to all respondents and, considering most students most likely cannot afford to buy a house yet, the focus is on renting house property. Important to note is that in the survey every construct – and its corresponding questions - is pre-announced by a section describing a particular situation. It is then up to the respondent to fill in their judgement of the hypothetical situation by answering the conforming scale questions.

3.3 Survey Design

Because this was a voluntary survey, the time of filling in the questions was taken into account and therefore I chose to have three questions for each section. In the testing phase during the development of the survey, there were 34 questions and the test persons needed an average time of 15 minutes to fill everything in. This meant that some of the construct questions had to be omitted or else the survey would take too long as the average attention span for respondents taking voluntary (unpaid) surveys is under ten minutes. It was not hard to omit questions because some of them were similar in measurement and only different in wording. This meant that questions that were understood to be equivalent to others were taken out. Out of the initial 34 questions plus 2 questions regarding respondents' demographics, 26 of them were kept in the final survey. A critical adjustment is also made regarding the Likert scale. As seen in the Table of constructs (**Appendix Table 1**) the constructs taken from literature are measured on different points (4,5,7) of Likert scales.

To be consequent throughout the whole survey and to not make it confusing for the respondents, the 5-point Likert scale was used for all questions (excluding the first two questions that are about respondents' demographics). First, thesistools.com was used as survey website and later enquetetools.nl as well to make the questions available to the respondent panel. The final survey can be found in the **Appendix Figure 5**.

4. Empirical Execution

In this part, the collected data (distributed through social media and paid respondent panel) is executed and analysed. This fourth section of the paper will firstly explain the demographic features of the experiment, thereafter the descriptives of the used variables will be explained. The following part will then describe the used method to test the hypotheses and provides an elaboration of the test's mathematical model.

4.1 Descriptive Statistics

4.1.1 Demographics

The first count of all collected respondents was 123. However, after deleting test subjects, and non-completed surveys, the total amount was 112 respondents. Age and gender were the asked demographic features of each respondent. In percentages, 6,3% of respondents were 20 years or younger, 33,9% were between 21 and 44 years and the remaining 59,8% of respondents were 45 years and older. With regards to gender, 49,1% of the respondents were female and 42,9% were male (**Table 4**).

These variables are kept constant throughout the experiment to see whether they have an influence on the relationship between independent and dependent variables. In other words, these two demographic features serve as control variables.

Table 4: Demographics – age, gender

		Frequency	% of respondents
Age	Younger than or 20 years	7	6,3
	Between 21 and 44 years	38	33,9
	45 years or older	67	59,8
Gender	Female	55	49,1
	Male	48	41,2

4.1.2 Central tendency and variability

All used variables were measured on a 5-point Likert-scale which explains the ordinal nature of the data. Because the possible answers ranged from strongly disagree (1) to strongly agree (5), it is not always obvious to interpret the numeric results from the output. In this case however, a series of items was used to measure one particular variable each (three items for one construct) and therefore the variables can be assumed as Likert scale data, which means

that the data can be analysed at the interval measurement scale (Clason & Dormody, 1994; Boone & Boone, 2012). It is therefore possible to derive the mean, standard deviation and variance of each variable. Note that the average of the items was used to calculate the descriptive statistics for each construct. This is shown in **Table 6** below:

Table 6: Descriptive statistics – mean, standard deviation and variance

	N	Mean	St. Deviation	Variance
Product Trust	112	3,571	0,667	0,445
Risk Preference	112	2,694	0,745	0,555
Procedural Fairness	112	3,691	0,871	0,758
Customization	112	3,396	0,768	0,590
Rewards	112	3,173	0,940	0,883
Perceived Benefit	112	3,432	0,782	0,612
Perceived Uncertainty	112	3,564	0,815	0,665
Willing to Share	112	2,705	0,748	0,560

These descriptives can be interpreted as follows: the tendency of answers on each construct on average is between “disagree”, “neutral” and “agree” (values between 2,6935 and 3,6905) which means that on average no extreme answers were noticeable for each construct. For reverse items (risk preference and willingness to share), answers are on average between “disagree” and “neutral”, which is plausible because of negatively keyed terms. This is not a favourable outcome, because it is difficult to identify effects and relationships when the answers are indifferent.

4.1.3 Validity

To measure internal consistency of each of the variables, the Cronbach’s Alpha (CA) is used as important guidance. For a variable to be accepted as internally consistent, which means that all related items should measure the same construct, the CA should be equal or higher than 0.7 (Bland & Altman, 1997). **Table 5** shows the CA for all used variables. There was one variable – product trust – that first had a very low CA of 0,478. This is probably because from the three items, only one item clearly states “trustworthy” while the other two items indirectly address trust, but could be interpreted by the respondent as either context-

dependent (for q5: I believe this product/service has the right features listed) or indicating individual preference (q3: I believe this product will not fully meet my needs). In the original scale five items are used while in this survey only three items were used. However, when deleting one item (q3) and keeping the remaining two items (q4 and q5) Cronbach's Alpha is significantly higher and thus reliable to measure product trust.

Table 5: Cronbach's alpha

Variable	Number of items	Cronbach's α
Product trust	2	0,717
Risk Preference	3	0,727
Procedural Fairness	3	0,749
Customization	3	0,833
Rewards	3	0,869
Perceived Benefits	3	0,827
Perceived Uncertainty	3	0,833
Willingness to share	3	0,700

4.2 Correlation Analysis

For measuring correlation between variables, the Pearson r is used. This can be found in the **Table 7**. Important takeaways within this table are the significant values for risk (-0,567**) and procedural fairness (0,318**) on perceived uncertainty as well as for customization (0,361**) and rewards (0,457**) on perceived benefits. Perceived uncertainty also has a significant influence on willingness to share (-0,508**), contrary to perceived benefits which does not have significant correlation with willingness to share. An important observation as well is the high, significant correlation of product trust with perceived benefits (0,383**) while the correlation between product trust and perceived uncertainty is insignificant. This is an interesting observation, as product trust was established to be an antecedent of perceived trust in the conceptual model. It seems however that trust is better suited as an antecedent of perceived benefits.

Table 7: Correlation Matrix

		Product Trust	Risk Preference	Procedural Fairness	Customization	Rewards	Perceived Benefit	Perceived Uncertainty	Willingness to Share
Product trust	r	1	,192*	,162	,281**	,162	,383**	-,039	,145
	p-value (2-tailed)		,042	,087	,003	,088	,000	,688	,128
	N		112	112	112	112	112	112	112
Risk preference	r		1	-,240*	,032	-,007	,141	-,567**	,582*
	p-value (2-tailed)			,011	,737	,944	,137	,000	,000
	N			112	112	112	112	112	112
Procedural	r			1	,356**	,185	,173	-,318**	,227*
	p-value (2-tailed)				,000	,051	,068	,001	,016
	N				112	112	112	112	112
Customization	r				1	,314**	,361**	-,029	,092
	p-value (2-tailed)					,001	,000	,758	,337
	N					112	112	112	112
Rewards	r					1	,457**	-,078	,140
	p-value (2-tailed)						,000	,412	,141
	N						112	112	112
Perceived Benefit	r						1	-,155	,159
	p-value (2-tailed)							,103	,093
	N							112	112
Perceived Uncertainty	r							1	-,508*
	p-value (2-tailed)								,000
	N								112
Willingness to Share	r								1
	p-value (2-tailed)								
	N								

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

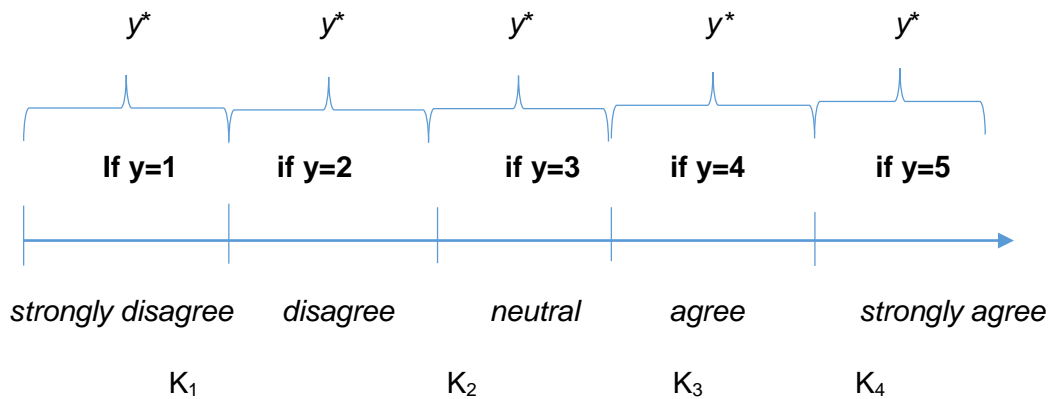
4.3 Hypothesis testing

As the dependent variable is ordinal (willingness to share) and the independent variables are categorical, the proper test to use is the ordinal regression.

For ordinal regression, it is important to establish the variable types first. To perform an ordinal (logit) regression, the dependent variable is to be ordinal (consistent with Likert-type data) regardless of the independent variables types. Ordinal regression builds on the linear regression, with categorical data containing inner sequences. The dependent variable is often a latent variable in ordered models, which means that this variable is indirectly measured and observed by customer's choice and behaviour (Daykin & Moffatt, 2002). To interpret the meaning of this ordinal regression, the following derivations are made:

Let y^* be the latent dependent variable in the conceptual model; y^* would therefore be the variable "willingness to share". It measures the underlying attitude of an individual towards wanting to share personal information. The direct observable(s) that explain y^* is called x , which is a vector of explanatory variables, in this case that would be the independent variables such as product trust (x_1) or customization (x_4). The regular y stands for the observed Likert

value for the dependent variable (1-5), given that $y=J$, if $K_{J-1} < y^* < \infty$. For each variable there are K_{j-1} responses possible (because of normal assumption of utility, u , which will be explained later). In a 5-point Likert scale this means that there are K_1 (*strongly disagree*), K_2 (*disagree*), K_3 (*neutral*), K_4 (*agree*) responses possible. As this is ordinal data with even sequences the best visualization for this can be made by simply drawing a line from left to right.



Keeping this in mind, y^* should fall between K_j and K_{j-1} if regular y should take any of the values of 2 to 4 on the Likert scale. If y is 1, then the y^* should be between $-\infty$ and K_1 . Lastly, if y is 5, y^* should have a value between K_4 and $+\infty$. This can be seen in the following example:

y	Value of y^*
1	$-\infty \leq y^* \leq K_1$
2	$K_1 \leq y^* \leq K_2$
3	$K_2 \leq y^* \leq K_3$
4	$K_3 \leq y^* \leq K_4$
5	$K_4 \leq y^* \leq +\infty$

For interpreting the ordered model, the probabilities of each response is needed. To do so, the following equation is used first:

$$y^* = x'\beta + u, \quad u: N(0,1)$$

Where β stands for the corresponding coefficient for a given explanatory x and u stands for utility which represents a numeric value to customer's preference for that particular x compared to all other x 's, which is assumed to be normally distributed with a mean of zero and a variance of one (**Figure 5a**). For example, the β for perceived uncertainty is -1,340 (seen later in paragraph 5, the Results section) which means that perceived uncertainty has a

negative effect on willingness to share. However, it is not allowed to interpret this beta coefficient as one does with the linear regression, for example “one unit of perceived uncertainty lowers willingness to share with 1,340 units”, as this is not a logical interpretation within ordinal data. The right interpretation to show the negatively significant effect in this case would therefore be: “perceived uncertainty has a negative effect on willingness to share information”. Only the direction of the relationship is thus important considering there is no meaningful numeric interpretation for the coefficients.

The reason why it is important to find y^* is to eventually derive the probability for each observed value. The following formulas show how to find the right proportion under the normality assumption:

$$P[y = 1] = P[y^* \leq k_1] = \Phi(k_1 - x'\beta)$$

$$P[y = 2] = P[k_1 < y^* \leq k_2] = P[y^* \leq k_2] - P[y^* \leq k_1] = \Phi(k_2 - x'\beta) - \Phi(k_1 - x'\beta)$$

$$P[y = 3] = P[k_2 < y^* \leq k_3] = P[y^* \leq k_3] - P[y^* \leq k_2] = \Phi(k_3 - x'\beta) - \Phi(k_2 - x'\beta)$$

$$P[y = 4] = P[k_3 < y^* \leq k_4] = P[y^* \leq k_4] - P[y^* \leq k_3] = \Phi(k_4 - x'\beta) - \Phi(k_3 - x'\beta)$$

$$P[y = 5] = 1 - P[y = 1] - P[y = 2] - P[y = 3] - P[y = 4] = 1 - P[y^* \leq k_4] = 1 - \Phi(k_4 - x'\beta)$$

For example, to measure the probability that respondents have $y=4$ on average, the needed proportion to measure is indicated by the yellow colour (**Figure 5b**). Important to note that with probabilities the maximum value is always 1, therefore the last category can be inferred by subtracting all other probabilities from 1, as seen with $P[y=5]$. The outcomes with the highest probabilities are the observed value of y 's that are most likely to be chosen.

Figure 5a: Normally distributed y^*

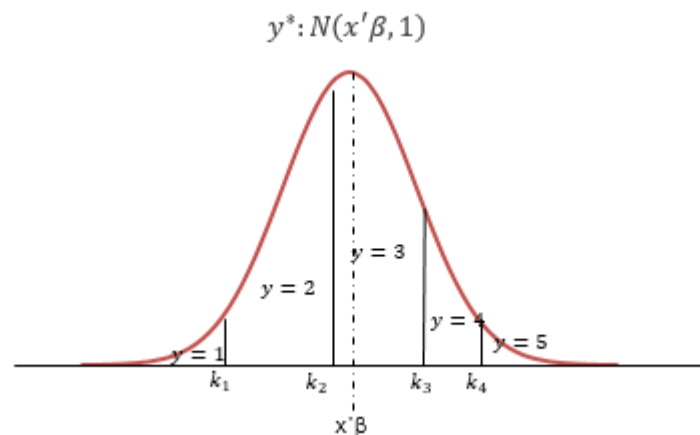
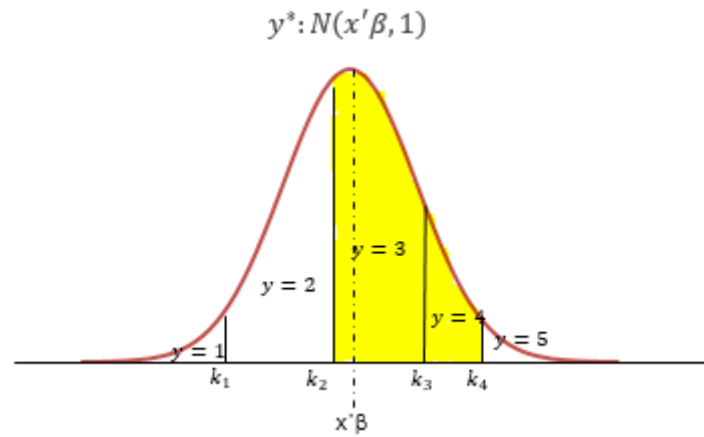


Figure 5b: Proportion of $y=4$



From: "Analyzing ordered responses: A review of the ordered probit model". By A. Daykin and P. Moffatt, 2002, *Understanding Statistics: Statistical Issues in Psychology, Education, and the Social Sciences* 1(3), p. 161.

5. Results

5.1 Ordinal regression

In this section the results of the tests will be discussed as well as the notion whether they support the aforementioned hypotheses. Note that a 95% confidence interval is used for the hypotheses which means that $\alpha = 0,05$, hence the significance level should be lower than 0,05 to support a particular hypothesis. In **Tables 8-12** the corresponding tests are shown with the estimates and significance levels. Ordinal logit regression is used to simplify the tests and because the results do not differ much from the ordinal probit regression

Six ordinal regression tests in total are performed in order to find relationships between variables. The first two regression models examine the relationships between antecedents and independent variables. For the first regression model the antecedents product trust, risk preference and procedural fairness are used as independent variables and perceived uncertainty is used as the dependent variable in order to establish any relationships between these variables. The following equation is applicable to the first regression model:

$$\text{Perceived Uncertainty} = f(\text{Product trust}, \text{Risk preference}, \text{Procedural fairness})$$

Table 8: Ordinal Regression 1 - antecedents of perceived uncertainty

Perceived Uncertainty	Variables	Estimate	Standard Error	Significance level	Significance level including control variables
Threshold	1	-7,982	1,755	,000	,000
	2	-4,685	1,423	,001	,002
	3	-2,196	1,360	,106	,092
	4	,177	1,359	,897	,842
Location	Product trust	-,082	,284	,772	,820
	Risk preference	-1,462	,291	,000	,000
	Procedural fairness	-,454	,223	,042	,049

The most noteworthy observation from the first regression model is that product trust does not have a significant influence on perceived uncertainty. Risk preference has a negative significant influence, which means that the more risk tolerant an individual is, the lower perceived uncertainty he derives from the situation. The same notion is applicable for procedural fairness, where a higher degree for procedural fairness results in a decrease in customer's perceived uncertainty.

The second regression model focuses on the antecedents customization and rewards in relation to perceived benefits. In this test, the antecedents function as independent variables as well with perceived benefits as the dependent variable. **Table 9** shows that both customization and rewards have a positive significant effect on perceived benefits, which means that both variables result in an increase in customer's perceived benefits. Customization and rewards are explained as a function of perceived benefits:

$$\text{Perceived Benefits} = f(\text{Customization}, \text{Rewards})$$

Table 9: Ordinal Regression 2 - antecedents of perceived benefit

Perceived Benefit	Variables	Estimate	Standard Error	Significance level	Significance level including control variables
Threshold	1	1,749	,968	,071	,222
	2	3,126	,952	,001	,021
	3	5,911	1,081	,000	,000
	4	8,850	1,260	,000	,000
Location	Customization	,804	,261	,002	,001
	Rewards	,743	,216	,001	,001

The third regression and fourth model will cover the relationship between perceived benefit (independent variable 1) on willingness to share (dependent variable) and perceived uncertainty (independent variable 2) on willingness to share (dependent variable). **Table 10** shows the negative significant effect of perceived uncertainty and the insignificant effect that perceived benefits has on willingness to share. As a result, perceived uncertainty decreases customer's willingness to share, while perceived benefits does not influence customer's willingness to share at all. In the model willingness to share is understood to be a function of both perceived uncertainty and perceived benefits.

Willingness to share personal information=f (Perceived Uncertainty, Perceived Benefits)

Table 10: Ordinal Regression 3 + 4 - perceived benefit and perceived uncertainty on willingness to share

Willingness to share	Variables	Estimate	Standard Error	Significance level	Significance level including control variables
Threshold	1	-6,414	1,407	,000	,001
	2	-3,436	1,298	,008	,120
	3	-1,038	1,269	,413	,949
	4	1,428	1,562	,361	,199
Location	Perceived Benefit	,268	,240	,264	,222
	Perceived Uncertainty	-1,340	,261	,000	,000

The fifth regression model shows the relationship between all antecedents (independent variables) and willingness to share (dependent variable). As seen in Table 11, the majority of antecedents were found to have insignificant effects when standard alpha of 5% is used. However, when raising alpha to 10% procedural fairness is found to have a significant effect on willingness to share as well. The positive significant relationship of risk preference indicates that the more risk tolerant a person is, the more willing he is to share personal information. The prospect of rewards also increases customer's willingness to share, however it has a smaller estimate and therefore is less of influence than risk preference. In this model willingness to share is understood to be a function of all five antecedents:

Willingness to share personal information=f (Product trust, Risk Preference, Procedural Fairness, Customization, Rewards)

Table 11: Ordinal Regression 5 - antecedents on dependent variable

Willingness to share	Variables	Estimate	Standard Error	Significance level	Significance level including control variables
Threshold	1	2,208	1,501	,141	,227
	2	5,677	1,582	,000	,002
	3	8,389	1,703	,000	,000
	4	11,073	1,982	,000	,000
Location	Product trust	-,324	,314	,302	,243
	Risk preference	2,062	,340	,000	,000
	Procedural fairness	,393	,252	,118	,064
	Customization	,273	,293	,351	,347
	Rewards	,438	,220	,046	,021

The sixth and last regression model is performed to establish whether there are any mediating effects, with the independent variables perceived benefits and perceived uncertainty serving as possible mediators. To examine any mediating effects (Baron & Kenny, 1986), the first step is to acknowledge whether the beta coefficient of each antecedent is significant in relation to the dependent variable, willingness to share. This is the first criteria in order to determine the mediator. As seen in the aforementioned Table 11, risk preference and rewards are the only two antecedents that meet criteria one. The second criteria is that the antecedent variable has a significant influence on the 'mediating' variables perceived uncertainty (in case of risk preference) and perceived benefits (in case of rewards). Both antecedents meet the second criteria as well. The third criteria when searching for mediating effects is that the supposed mediators (perceived uncertainty and perceived benefits) need to have a significant effect on the dependent variable, willingness to share. The results suggest that perceived benefits does not significantly influence willingness to share and therefore it cannot function as a mediator. Perceived uncertainty however does have a significant influence on willingness to share and therefore meets the third criteria. For the fourth and last criteria, both risk preference and perceived uncertainty are used in the ordinal regression model as independent variables and willingness to share as dependent variable. In order for perceived uncertainty to

be a full mediator, the relationship with willingness to share should be significant while the relationship between risk preference and willingness to share should be nonsignificant. The results show that both risk preference and perceived uncertainty are significant which indicates partial mediation. Section 5.9 will explain these findings in more depth.

Table 12: Ordinal Regression 6 – partial mediating effect found

Willingness to share	Variables	Estimate	Standard Error	Significance level	Significance level including control variables
Threshold	1	-1,142	1,643	,487	,614
	2	2,268	1,653	,170	,182
	3	4,975	1,716	,004	,007
	4	7,604	1,947	,000	,000
	Risk preference	-,704	,288	,014	,014
	Perceived Uncertainty	1,622	,347	,000	,000

5.2 Relationship product trust on perceived uncertainty and willingness to share

In the analysis, product trust was found to not have a significant effect on both perceived uncertainty ($0,820 > \alpha$) and willingness to share ($0,243 > \alpha$). This observation could already be predicted from the correlation matrix, where the correlation between these variables showed a non-significant effect. A provocative observation was however that product trust does have a positively significant correlation and effect on perceived benefit. The most reasonable explanation therefore is that product trust is acknowledged by the respondents as an antecedent of benefits instead of uncertainty, while in the conceptual model product trust was thought to serve as a determinant of risk (uncertainty). The probable reason why product trust does not have a significant influence on willingness to share is because although there is a positive significant effect on perceived benefits, in turn perceived benefits does not have a significant effect on willingness to share (see section 5.7). This seemingly explains why there is no apparent relationship between product trust and willingness to share, as a result of no causal relationship being available.

5.3 Relationship risk preference on perceived uncertainty and willingness to share

There is a significant effect of risk preference ($0,000 < \alpha$) on perceived uncertainty as well as willingness to share. This supports the hypothesis that people who have more risk tolerance, will derive lower perceived uncertainty. This effect is one of the strongest in the entire model and explains the importance of risk perception on individual's disposition towards personal information sharing. In other words, increased perceived uncertainty lowers his willingness to share personal information, while this is vice versa for a risk-seeking individual.

5.4 Relationship procedural fairness on perceived uncertainty and willingness to share

Procedural fairness was found to have a significant effect on perceived uncertainty, even when controlling for other variables ($0,049 < \alpha$), but not on willingness to share ($0,064 > \alpha$). However, when increasing alpha to 10%, with control variables added, procedural fairness does seem to have a significant effect on willingness to share ($0,064 < \alpha=0,1$). A reason for the insignificant results on willingness to share for the 5% alpha level can be that response rate for neutral (3) is fairly high, for procedural fairness 39,3% scores in threshold 3 and for willingness to share this is 33,9%. This might make it difficult to discern any relationships between these two variables.

5.5 Relationship customization on perceived benefits and willingness to share

Significant for perceived benefits, not on willingness to share. Customization is found to be significant for perceived benefits ($0,001 < \alpha$) with control variables included, which means that customization such as adapting (online) features to personal preference is accepted as beneficial for most individuals. However, customization does not have a significant relationship with willingness to share ($0,347 < \alpha$) which for the most part has to do with it being an antecedent of perceived benefits, which in turn has an insignificant relationship as well with willingness to share. Also, while most individuals appreciate customization and give this a high rating, their willingness to share is quite low in rating, meaning that there is no causal link detectable.

5.6 Relationship rewards on perceived benefits and willingness to share

Rewards is one of the antecedents that has established a significant effect on both perceived benefits ($0,001 < \alpha$) as well as willingness to share ($0,046 < \alpha$) in which the effect is even stronger when control variables are included ($0,021 < \alpha$). Consequently, rewards can be acknowledged as a strong motivator for persuasion which positively influence customer's perceived benefits and willingness to share.

5.7 Relationship perceived uncertainty on willingness to share

Perceived uncertainty has a strong effect ($0,000 < \alpha$) on the dependent variable, willingness to share (personal information). This explains the logical relationship also found in literature that if customers believe there is some uncertainty involved, they are less likely to share their personal information.

5.8 Relationship perceived benefits on willingness to share

An important finding in this model is that perceived benefits has no influence on willingness to share ($0,222 > \alpha$). This means that perceived benefits alone cannot explain willingness to share. In this research a possible explanation for the insignificant results could be that up to 50,1% has (on average) given an neutral answer (3) on questions regarding perceived benefits. As mentioned before, questions linked to willingness to share also have a large proportion of neutral answers (33,9%), which means that it is hard to discern any causal relationship between these two variables.

5.9 Mediating effects

In the ordinal regression model, Table 11 ascertained that the first criteria for establishing mediating effects was met with regards to antecedents risk preference ($0,000 < \alpha$) and rewards ($0,021 < \alpha$) as they have a significant influence on willingness to share. The second criteria is to establish whether each antecedent has a significant influence on the 'mediator' variable, which in this case is perceived uncertainty for risk preference and perceived benefits for rewards. **Table 8** and **9** show that there is a significant relationship for perceived uncertainty ($0,000 < \alpha$) and perceived benefits ($0,001 < \alpha$). Both variables therefore meet the second criteria. In the third criteria the 'mediator' variable should also have a significant influence on the dependent variable, Table 10 showed that perceived benefits was found to be insignificant in relation to willingness to share ($0,246 > \alpha$) and therefore could not be a mediator. This is in contrast to perceived uncertainty which did significantly influence willingness to share ($0,000 < \alpha$) and thus met the third criteria. The last criteria maintains that in order to discern a full mediating effect, both antecedent (i.e. risk preference) and mediator (i.e. perceived uncertainty) should be included as independent variables in the model, where only the mediator should have a significant effect on the dependent variable, willingness to share. This is only partly true as **Table 12** shows that both risk preference ($0,000 < \alpha$) and perceived uncertainty ($0,014 < \alpha$) are significant. Partial mediation is therefore assumed, which means that perceived uncertainty explains the relationship between risk preference and willingness to share to a certain extent. This is opposed to full mediation, where perceived uncertainty explains the whole relationship between risk preference and willingness to share. The reason for partial mediation is most likely resolved by the comprehensive nature of perceived

uncertainty, that consists of more determinants involving risk which are not captured within this model.

Additionally, the absence of any other mediating effects is mainly impacted by the insignificant effects in the model regarding the criteria that had to be met, such as product trust on perceived uncertainty and perceived benefits on willingness to share and three out of five antecedents that do not have an influence on willingness to share. This is not an ideal situation where interacting effects can be established. Therefore, the conceptual model can unfortunately not be established as a strong exemplary which can explain what factors influence willingness to share.

Consequently, the ordinal regression tests shows which of the hypotheses that were established in part 3 of the thesis are supported and which ones are not. An overview is seen in **Table 13**.

Table 13: Hypotheses

H1a	Increased consumer trust in the product leads to reduced perceived uncertainty	Not supported
H1b	Increased procedural fairness leads to a decrease in perceived uncertainty	Supported
H1c	People who are more tolerant in risk are likely to have lower perceived uncertainty	Supported
H2a	Customized product or service leads to increased perceived benefits	Supported
H2b	Rewards lead to an increase in perceived benefits	Supported
H3a	Increased perceived uncertainty leads to a decrease in willingness to share personal information	Supported
H3b	Perceived benefits will lead to an increase in willingness to share personal information	Not supported
	Mediating effects	Supported - partially

6. Conclusion

6.1 General Conclusion

The main purpose of this thesis is to find prominent factors influencing customer's willingness to share personal information online. Extensive established literature has already focused on the trade-off effect of benefits versus costs, also known as the 'privacy calculus' within online information sharing, which means that, as rational agents, individuals will share their private data when they perceive the benefits gained from sharing that data to be greater than the costs that come with sharing that information. Another subject prominent within literature is the 'privacy paradox' which mentions that notwithstanding privacy concerns, customers are often willing to share personal information in exchange for relatively small accolades. While there is considerable literature explaining privacy concerns and personalization benefits for customers online, there has not been literature yet that explains the effect of customer's perceived uncertainty and benefits with its corresponding antecedents on willingness to share their privacy. With this research the aim is to contribute to the knowledge in this field, with the customer in the leading role.

While examining previous literature on digital privacy as well as literature explaining customer's perception (on risk and benefits) a conceptual model was refined, which aims to explain the factors influencing perceived uncertainty and perceived benefits. For perceived uncertainty the conspicuous factors found within literature were product trust, risk preference and procedural fairness while for perceived benefits these were customization and rewards. The main purpose of this thesis is to establish whether these variables have an effect on customer's willingness to share. The main results from the research are as follows. Perceived uncertainty influences willingness to share personal information, with risk preference and procedural fairness as the inherent factors of perceived uncertainty. In other words, whether a person is risk-seeking or risk averse has an effect on perceived uncertainty, with more risk-tolerant individuals deriving lower perceived uncertainty and risk-averse individuals deriving higher perceived uncertainty. Procedural fairness also influences perceived uncertainty, which corresponds with the general assumption that when procedural fairness is higher, perceived uncertainty will be lower. Together these antecedents are part of perceived uncertainty, which consequently negatively effects willingness to share: when perceived uncertainty is high, the willingness to share is expected to be low. In case of perceived benefits, both customization and rewards are inherent factors to perceived benefits. A customized product online will positively influence customer's perceived benefits as well as the anticipation of a reward, whether this is monetary or non-monetary. These results confirm the findings within the

literature. One particular observation with regards to personal information sharing is that receiving rewards has a positive influence on both customer's perceived benefits and willingness to share, which ultimately supports the 'privacy paradox'.

In contrast, perceived benefits was found to not have an effect on willingness to share. This is not in accordance with findings in literature. Three out of five antecedents were found to have insignificant effects on the dependent variable, with only one partially mediated relationship observable in the conceptual model. These findings show that perceived uncertainty can independently intervene between the relationship of risk preference and willingness to share. In other words, an in- or decrease in perceived uncertainty can cause an even stronger impact of individual's risk preference on customer's willingness to share personal information.

Concluding, the conceptual model was inadequate to fully establish the factors influencing customer's disposition towards sharing personal information. Nevertheless, there are important findings that are in sync with the literature. This concludes that while the conceptual model is not a mediating model, it does however explain certain factors influencing willingness to share, such as perceived uncertainty and supports the 'privacy paradox' assumption found within literature.

6.2 Managerial implications

As found in the results, perceived uncertainty has a strong effect on willingness to share information. Risk preference and procedural fairness should therefore be taken into account when a firm wants to persuade a customer towards sharing personal information. While risk preference is individual-specific and difficult to change externally, having transparent policies and communicating this in a good manner to the customer can lead to better response from customers, as they would like to be involved in the process of personal information sharing. Important to note as well is that customer's willingness to share information is impacted by the amount of uncertainty perceived, which means that firms should maintain reasonable protocols with regards to uncertainty to ensure customers safety.

It is also beneficial for the firm to give the customer an offering in exchange of their personal information, as there has been evidence that customers find this a moderate compensation for their trouble. Also, customers derive great advantage from customization features as part of their online experience. While this research does not observe a causal link between perceived benefits and willingness to share, it is however a good incentive for a firm to consider what stimulates customers' online experience and how to implement this in their online activities as this can be helpful for customer satisfaction.

References

- Acquisti, A., & Grossklags, J. (2005). Privacy and rationality in individual decision making. *IEEE Security & Privacy*, 2(2005), 24-30.
- Alba, J. W., & Chattopadhyay, A. (1985). Effects of context and part-category cues on recall of competing brands. *Journal of Marketing Research*, 340-349.
- Aleskerov, F., Bouyssou, D., & Monjardet, B. (2007). *Utility maximization, choice and preference* (Vol. 16). Springer Science & Business Media.
- Aljazzaf, Z. M., Perry, M., & Capretz, M. A. (2010, September). Online trust: Definition and principles. In *Computing in the Global Information Technology (ICCGI), 2010 Fifth International Multi-Conference on* (pp. 163-168). IEEE.
- Ariely, D., & Simonson, I. (2003). Buying, bidding, playing, or competing? Value assessment and decision dynamics in online auctions. *Journal of Consumer psychology*, 13(1), 113-123.
- Arora, N., Dreze, X., Ghose, A., Hess, J. D., Iyengar, R., Jing, B., & Sajeesh, S. (2008). Putting one-to-one marketing to work: Personalization, customization, and choice. *Marketing Letters*, 19(3-4), 305-321.
- Arnett, J. (1994). Sensation seeking: A new conceptualization and a new scale. *Personality and individual differences*, 16(2), 289-296.
- Awad, N. F., & Krishnan, M. S. (2006). The personalization privacy paradox: an empirical evaluation of information transparency and the willingness to be profiled online for personalization. *MIS quarterly*, 13-28.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Barwise, P., & Strong, C. (2002). Permission-based mobile advertising. *Journal of interactive Marketing*, 16(1), 14-24.
- Benthin, A., Slovic, P., & Severson, H. (1993). A psychometric study of adolescent risk perception. *Journal of adolescence*, 16(2), 153.
- Berendt, B., & Teltzrow, M. (2005). Addressing users' privacy concerns for improving personalization quality: Towards an integration of user studies and algorithm evaluation. In *Intelligent Techniques for Web Personalization* (pp. 69-88). Springer Berlin Heidelberg.
- Berger, C., & Piller, F. (2003). Customers as co-designers. *MANUFACTURING ENGINEER-LONDON*, 82(4), 42-45.
- Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *Bmj*, 314(7080), 572.
- Boone, H. N., & Boone, D. A. (2012). Analyzing Likert data. *Journal of extension*, 50(2), 1-5.
- boyd, d. (2010) 'Social networking sites as networked publics: affordances, dynamics, implications', in Z. Papacharissi (ed.) *A networked self*, New York: Routledge.

- Bstieler, L. (2005). The moderating effect of environmental uncertainty on new product development and time efficiency. *Journal of Product Innovation Management*, 22(3), 267-284.
- Buchanan, T., Paine, C., Joinson, A. N., & Reips, U. D. (2007). Development of measures of online privacy concern and protection for use on the Internet. *Journal of the American Society for Information Science and Technology*, 58(2), 157-165.
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological bulletin*, 125(3), 367.
- Chellappa, R. K., & Sin, R. G. (2005). Personalization versus privacy: An empirical examination of the online consumer's dilemma. *Information Technology and Management*, 6(2-3), 181-202.
- Chen, Y. H., & Barnes, S. (2007). Initial trust and online buyer behaviour. *Industrial management & data systems*, 107(1), 21-36.
- Clason, D. L., & Dormody, T. J. (1994). Analyzing data measured by individual Likert-type items. *Journal of Agricultural Education*, 35, 4.
- Culnan, M. J., & Armstrong, P. K. (1999). Information privacy concerns, procedural fairness, and impersonal trust: An empirical investigation. *Organization science*, 10(1), 104-115.
- Cunningham, S. M. (1967). The major dimensions of perceived risk. *Risk taking and information handling in consumer behavior*, 1, 82-111.
- Daykin, A. R., & Moffatt, P. G. (2002). Analyzing ordered responses: A review of the ordered probit model. *Understanding Statistics: Statistical Issues in Psychology, Education, and the Social Sciences*, 1(3), 157-166.
- De Cremer, D., & Tyler, T. R. (2007). The effects of trust in authority and procedural fairness on cooperation. *Journal of Applied Psychology*, 92(3), 639.
- Dinev, T., & Hart, P. (2006). An extended privacy calculus model for e-commerce transactions. *Information Systems Research*, 17(1), 61-80.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. G. (2011). Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, 9(3), 522-550.
- Dwyer, C., Hiltz, S., & Passerini, K. (2007). Trust and privacy concern within social networking sites: A comparison of Facebook and MySpace. *AMCIS 2007 proceedings*, 339.
- Engel, J. F., Blackwell, R. D., & Miniard, P. W. (1986). *Consumer behavior*. New York: Dryden.
- Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International journal of human-computer studies*, 59(4), 451-474.
- Ferguson, C. (2000). 'Shaking the conceptual foundations, 'too: integrating research and technology support for the next generation of information service. *College & Research Libraries*, 61(4), 300-311.
- Fox-Brewster, T. (2016, August 25). You Have 30 Days To Stop WhatsApp Sharing Your Data With Facebook. Retrieved from:

<http://www.forbes.com/sites/thomasbrewster/2016/08/25/whatsapp-facebook-share-your-number-and-usage-data/#6e8eae4a3bee>

- Fromme, K., Stroot, E. A., & Kaplan, D. (1993). Comprehensive effects of alcohol: Development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment*, 5(1), 19.
- Fukuyama, F. (1995). *Trust: The social virtues and the creation of prosperity*(No. D10 301 c. 1/c. 2). New York: Free press.
- Gardner, M., & Steinberg, L. (2005). Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: an experimental study. *Developmental psychology*, 41(4), 625.
- Gurvey, B., & Lin, J. (2000). The age factor: how internet use varies from teens to seniors. *Advertising Age*, 71(16), 22.
- Goldberg, J., & Fischhoff, B. (2000). The long-term risks in the short-term benefits: Perceptions of potentially addictive activities. *Health Psychology*, 19(3), 299.
- Goodwin, C., & Ross, I. (1992). Consumer responses to service failures: influence of procedural and interactional fairness perceptions. *Journal of Business research*, 25(2), 149-163.
- Graeff, T. R., & Harmon, S. (2002). Collecting and using personal data: Consumers' awareness and concerns. *Journal of Consumer Marketing*, 19(4), 302-318.
- Hann, I. H., Hui, K. L., Lee, T., & Png, I. (2002). Online information privacy: Measuring the cost-benefit trade-off. *ICIS 2002 Proceedings*, 1.
- Häubl, G., Dellaert, B. G., Murray, K. B., & Trifts, V. (2004). Buyer behavior in personalized shopping environments. In *Designing personalized user experiences in eCommerce* (pp. 207-229). Springer Netherlands.
- Hoffman, D. L., Novak, T. P., & Peralta, M. (1999). Building consumer trust online. *Communications of the ACM*, 42(4), 80-85.
- Huang, K. T., Lee, Y. W., & Wang, R. Y. (1998). *Quality information and knowledge*. Prentice Hall PTR.
- Hui, K. L., Tan, B. C., & Goh, C. Y. (2006). Online information disclosure: Motivators and measurements. *ACM Transactions on Internet Technology (TOIT)*, 6(4), 415-441.
- Hui, K. L., Teo, H. H., & Lee, S. Y. T. (2007). The value of privacy assurance: an exploratory field experiment. *Mis Quarterly*, 19-33.
- Jarvenpaa, S. L., Tractinsky, N., & Saarinen, L. (1999). Consumer trust in an internet store: a cross-cultural validation. *Journal of Computer-Mediated Communication*, 5(2), 0-0.
- Jøsang, A., Ismail, R., & Boyd, C. (2007). A survey of trust and reputation systems for online service provision. *Decision support systems*, 43(2), 618-644.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.

- Katsikas, S. K., Lopez, J., & Pernul, G. (2005, November). Trust, privacy and security in e-business: Requirements and solutions. In *Panhellenic Conference on Informatics* (pp. 548-558). Springer Berlin Heidelberg.
- Katz, D. (1960). The functional approach to the study of attitudes. *Public opinion quarterly*, 24(2), 163-204.
- Kautonen, T., & Karjaluoto, H. (2008). Trust and New Technologies. *Marketing and Management in Internet and Mobile Media* (eds.). Cheltenham. Edward Elgar Publishing.
- Kleinman (2013, June 10). What does Prism tell us about privacy protection? Retrieved from: <http://www.bbc.com/news/technology-22839609>
- Kobsa, A., & Teltzrow, M. (2004, May). Contextualized communication of privacy practices and personalization benefits: Impacts on users' data sharing and purchase behavior. In *International Workshop on Privacy Enhancing Technologies* (pp. 329-343). Springer Berlin Heidelberg.
- Koller, M. (1988). Risk as a determinant of trust. *Basic and Applied Social Psychology*, 9(4), 265-276.
- Laufer, R. S., & Wolfe, M. (1977). Privacy as a concept and a social issue: A multidimensional developmental theory. *Journal of social Issues*, 33(3), 22-42.
- Lazar, J., & Preece, J. (2002). *Social considerations in online communities: Usability, sociability, and success factors*. na.
- Leventhal, G. S. (1976). The distribution of rewards and resources in groups and organizations. *Advances in experimental social psychology*, 9, 91-131.
- Lewis, J. D., & Weigert, A. (1985). Trust as a social reality. *Social forces*, 63(4), 967-985.
- Lopes, L. L. (1987). Between hope and fear: The psychology of risk. *Advances in experimental social psychology*, 20, 255-295.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of management review*, 20(3), 709-734.
- Maguire, M. (2001). Methods to support human-centred design. *International journal of human-computer studies*, 55(4), 587-634.
- Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information systems research*, 15(4), 336-355.
- Mangalindan, M. (2003). Playing the Search Engine Game'. *The Wall Street Journal*, R1.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of management review*, 20(3), 709-734.
- McKnight, D. H., & Chervany, N. L. (2001). Trust and distrust definitions: One bite at a time. In *Trust in Cyber-societies* (pp. 27-54). Springer Berlin Heidelberg.
- McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information systems research*, 13(3), 334-359.

- Merle, A., Chandon, J. L., Roux, E., & Alizon, F. (2010). Perceived value of the Mass-Customized product and mass customization experience for individual consumers. *Production and Operations Management*, 19(5), 503-514.
- Metzger, M. J. (2004). Privacy, trust, and disclosure: Exploring barriers to electronic commerce. *Journal of Computer-Mediated Communication*, 9(4), 00-00.
- Milne, G. R., & Gordon, M. E. (1993). Direct mail privacy-efficiency trade-offs within an implied social contract framework. *Journal of Public Policy & Marketing*, 206-215.
- Mittal, B., & Lassar, W. M. (1996). The role of personalization in service encounters. *Journal of retailing*, 72(1), 95-109.
- Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *The journal of marketing*, 20-38.
- Okazaki, S., Li, H., & Hirose, M. (2009). Consumer privacy concerns and preference for degree of regulatory control. *Journal of Advertising*, 38(4), 63-77.
- Peppers, D., & Rogers, M. (1997). Making the transition to one-to-one marketing. *INC-BOSTON MA*, 63-67.
- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of personality and social psychology*, 46(1), 69.
- Posner, M. I. (1978). *Chronometric explorations of mind*. Lawrence Erlbaum.
- Raghu, T. S., Kannan, P. K., Rao, H. R., & Whinston, A. B. (2001). Dynamic profiling of consumers for customized offerings over the Internet: A model and analysis. *Decision Support Systems*, 32(2), 117-134.
- Rainie (2015, June 3). Privacy in the Digital Age. Retrieved from: <http://www.pewinternet.org/2015/06/03/privacy-in-the-digital-age/>
- Regidi, A. (2016, August 26). WhatsApp's new privacy policy is unfair, but legal. Retrieved from: <http://tech.firstpost.com/news-analysis/whatsapps-new-privacy-policy-is-unfair-but-legal-331876.html>
- Reid, D. A., Pullins, E. B., & Plank, R. E. (2002). The impact of purchase situation on salesperson communication behaviors in business markets. *Industrial Marketing Management*, 31(3), 205-213.
- Reimann, M., Lünemann, U. F., & Chase, R. B. (2008). Uncertainty avoidance as a moderator of the relationship between perceived service quality and customer satisfaction. *Journal of Service Research*, 11(1), 63-73.
- Stone, E. F., Gueutal, H. G., Gardner, D. G., & McClure, S. (1983). A field experiment comparing information-privacy values, beliefs, and attitudes across several types of organizations. *Journal of applied psychology*, 68(3), 459.
- Schafer, J. B., Konstan, J. A., & Riedl, J. (2001). E-commerce recommendation applications. In *Applications of Data Mining to Electronic Commerce* (pp. 115-153). Springer US.

- Schoenbachler, D. D., & Gordon, G. L. (2002). Multi-channel shopping: understanding what drives channel choice. *Journal of Consumer Marketing*, 19(1), 42-53.
- Sheehan, K. B. (2002). Toward a typology of Internet users and online privacy concerns. *The Information Society*, 18(1), 21-32.
- Spiekermann, S., Grossklags, J., & Berendt, B. (2001, October). E-privacy in 2nd generation E-commerce: privacy preferences versus actual behavior. In *Proceedings of the 3rd ACM conference on Electronic Commerce* (pp. 38-47). ACM.
- Stigler, G. J. (1980). An introduction to privacy in economics and politics. *The Journal of Legal Studies*, 9(4), 623-644.
- Stone, E. F., & Stone, D. L. (1990). Privacy in organizations: Theoretical issues, research findings, and protection mechanisms. *Research in personnel and human resources management*, 8(3), 349-411.
- Suh, B., & Han, I. (2003). The impact of customer trust and perception of security control on the acceptance of electronic commerce. *International Journal of electronic commerce*, 7(3), 135-161.
- Sutanto, J., Palme, E., Tan, C. H., & Phang, C. W. (2013). Addressing the Personalization-Privacy Paradox: An Empirical Assessment from a Field Experiment on Smartphone Users. *Mis Quarterly*, 37(4), 1141-1164.
- Taylor, J. W. (1974). The role of risk in consumer behavior. *The Journal of Marketing*, 54-60.
- Taylor, D. G., Davis, D. F., & Jillapalli, R. (2009). Privacy concern and online personalization: The moderating effects of information control and compensation. *Electronic Commerce Research*, 9(3), 203-223.
- Thibaut, J. W., & Walker, L. (1975). *Procedural justice: A psychological analysis*. L. Erlbaum Associates.
- Thornton, B., Gibbons, F. X., & Gerrard, M. (2002). Risk perception and prototype perception: Independent processes predicting risk behavior. *Personality and Social Psychology Bulletin*, 28(7), 986-999.
- Van den Bos, K., Wilke, H. A., & Lind, E. A. (1998). When do we need procedural fairness? The role of trust in authority. *Journal of Personality and social Psychology*, 75(6), 1449.
- Wang, J., & Senecal, S. (2007). Measuring perceived website usability. *Journal of Internet Commerce*, 6(4), 97-112.
- Westin, A. F. (1968). Privacy and freedom. *Washington and Lee Law Review*, 25(1), 166.
- Wilson, M., & Daly, M. (1985). Competitiveness, risk taking, and violence: The young male syndrome. *Ethology and sociobiology*, 6(1), 59-73.
- Xu, H., Luo, X. R., Carroll, J. M., & Rosson, M. B. (2011). The personalization privacy paradox: An exploratory study of decision making process for location-aware marketing. *Decision Support Systems*, 51(1), 42-52.
- Young, A. L., & Quan-Haase, A. (2013). Privacy protection strategies on Facebook: The Internet privacy paradox revisited. *Information, Communication & Society*, 16(4), 479-500.

Zaleskiewicz, T. (2001). Beyond risk seeking and risk aversion: Personality and the dual nature of economic risk taking. *European journal of Personality*, 15(S1), S105-S122.

Zaltman, G., & Wallendorf, M. (1983). *Consumer behaviour*. New York: Wiley.

Zuckerman, M., Eysenck, S. B., & Eysenck, H. J. (1978). Sensation seeking in England and America: cross-cultural, age, and sex comparisons. *Journal of consulting and clinical psychology*, 46(1), 139.

Appendix

Table 1: Construct table

Construct	Explanation	Measurement	Scale	Source	Variable type
Product trust	Product trust is the belief that the product / service will fulfil its functions as understood by the buyer	<ol style="list-style-type: none"> 1. This product/service will not unreservedly meet our needs 2. This product/service has the technical attributes necessary to do the job 3. This product/service will give us little trouble in using it 4. This product/service will do everything we want it to do 	1-5 scale, with 1 being "strongly agree" and 5 being "strongly disagree"	Reid, Pullins & Plank, 1999	Antecedent
Risk preference	Assessing a customer's disposition towards risk	<ol style="list-style-type: none"> 1. In general, it would be risky to give (the information) to online companies. 2. There would be high potential for loss associated with giving (the information) to online firms. 3. There would be too much uncertainty associated with 	1-7 Likert scale, with 1 being "strongly disagree" and 7 being "strongly agree"	Jarvenpaa & Tractinsky 1999; Malholtra, Kim & Agarwal, 2004	Antecedent

		<p>giving (the information) to online firms.</p> <p>4. Providing online firms with (the information) would involve many unexpected problems.</p> <p>5. I would feel safe giving (the information) to online companies, (r)*</p>			
Procedural fairness	“Consumer perceptions of the fairness of information use based on what the firm disclosed to the consumer about its information handling procedures”	<ol style="list-style-type: none"> 1. Before you decided to subscribe, the service provider would inform you fully about the collection of subscriber profile information and how it would be used 2. You could control the types of products and services advertised to you as well as when and for how long advertising messages would be displayed on the screen; 3. You could indicate what information in your subscriber profile could be 	1-4 Likert scale, with 1 being “not at all interested” and 4 being “very interested”	Culnan & Armstrong, 1999	Antecedent

		<p>used for marketing and what couldn't;</p> <p>4. You could review the information in your subscriber profile and correct any errors.</p>			
Customization	Consumers' value for online personalization	<ol style="list-style-type: none"> 1. I value Web pages that are personalized for the device (e.g. computer, palm, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that I use. 2. I value Web sites that are personalized for my usage experience preferences 3. I value Web sites that acquire my personal preferences and personalize the services and products themselves 4. I value goods and services that are personalized based on information that is collected automatically 	1-7 Likert scale, with 1 being "strongly disagree" and 7 being "strongly agree"	Chellappa & Sin, 2005	Antecedent

		<p>(such as IP address, pages viewed, access time) but cannot identify me as an individual.</p> <p>5. I value goods and services that are personalized on information that I have voluntarily given out (such as age range, salary range, Zip Code) but cannot identify me as an individual.</p> <p>6. I value goods and services that are personalized on information I have voluntarily given out and can identify me as an individual (such as name, shipping address, credit card information).</p>			
Perceived benefits	“Consumer’s belief about the extent to which he or she will become better off from the online transaction with a certain Website”	<ol style="list-style-type: none"> 1. I think using this Website is convenient. 2. I can save money by using this Website. 3. I can save time by using this Website. 4. Using this Website enables me to accomplish a shopping task 	1-7 Likert scale, with 1 being “strongly disagree” and 7 being “strongly agree”	Kim, Ferrin & Rao, 2008;	Antecedent

		<p>more quickly than using traditional stores.</p> <p>5. Using this Website increases my productivity in shopping (e.g., make purchase decisions or find product information within the shortest time frame).</p>			
Perceived uncertainty	"Online privacy concerns"	<ol style="list-style-type: none"> 1. I am concerned that the information I submit on the Internet could be misused. 2. When I shop online, I am concerned that the credit card information can be stolen while being transferred on the Internet. 3. I am concerned about submitting information on the Internet because of what others might do with it. 4. I am concerned about submitting information on the Internet because it can be used in a way I have not foreseen. 	1-7 Likert scale, with 1 being "strongly disagree" and 7 being "strongly agree"	Bandyopadhyay, 2012	Independent

Rewards	"Expected rewards for information sharing"	<ol style="list-style-type: none"> 1. I expect to receive monetary rewards in return for my knowledge sharing. 2. I expect to receive additional points for promotion in return for my knowledge sharing. 3. I expect to receive an honor such as educational opportunity in return for my knowledge sharing. 	<p>1-5 scale, with 1 being "strongly agree" and 5 being "strongly disagree"</p>	Bock & Kim, 2001	Independent
---------	--	--	---	------------------	-------------

<p>Willingness to share personal information</p>	<p>“Consumer’s disposition towards sharing their personal information”</p>	<p>To what extent (on a scale from 1 to 7) do you agree with the following?</p> <ol style="list-style-type: none"> 1. I am generally unwilling to disclose personal information at a web site. 2. I avoid using web sites that require personal information about myself before letting me use the content. 3. If a web site requires registration with personal information before letting me use the content, I generally provide false information 	<p>1-7 Likert scale, with 1 being “strongly disagree” and 7 being “strongly agree”</p>	<p>Bandyopadhyay, 2012</p>	<p>Dependent</p>
--	--	--	--	----------------------------	------------------

Table 2: Adjusted constructed table

Construct	Adapted or copied from original work	Scale
Product trust	Adapted into "I-form" and specifically adjusted to fit within context; omitted 1 question	5 point Likert scale, like original construct
Risk preference	Original; scale adapted; omitted 2 questions	From 7 point Likert scale to 5
Procedural fairness	Original; scale adapted; omitted 1 question	From 4 point Likert scale to 5
Customization	Original; scale adapted; omitted 3 questions	From 7 point Likert scale to 5
Perceived benefits	Original; scale adapted; omitted 2 questions	From 7 point Likert scale to 5
Perceived uncertainty	Original; scale adapted; omitted 1 question	From 7 point Likert scale to 5
Rewards	Original	5 point Likert scale, like original construct
Willingness to share personal information	Original; scale adapted	From 7 point Likert scale to 5

Figure 5: Survey via thesistools.com

1.

What is your age? *

- <20 years
- 21-44 years
- >45 years

2.

What is your gender? *

- male
- female

Section I: Suppose you are thinking of renting a nice comfortable house you have seen in whatever city or place you prefer. You have saved enough money to not worry too much about the expenses.

Your friend suggest you try a local broker who can help you with your search. The broker shows you the housing website funda.nl (take a look on the site, go to left below and click on 'funda in English' if you are not Dutch) and tells you to call him if you have seen anything nice. You open the webpage and click on the city or place you want to see houses from.

3.

I believe this product/service on funda.nl will NOT fully meet my needs

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

4.

I believe this product/service on funda.nl is trustworthy

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

5.

I believe this product/service on funda.nl has the right features listed I want to know when purchasing a house

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

Section II: You found your dream house and you notice that it is available for rent!

You quickly click on 'Respond to this property' and you see you first have to fill in your contact details.

To what extent do you agree with the following in this particular situation:

6.

I think in general it would be risky to give (the personal information) to online companies.

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

7.

I think there would be high potential for loss associated with giving (the information) to online firms.

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree Strongly agree

8.

I think there is a lot of uncertainty associated with giving (the information) to online firms.

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree Strongly agree

Section III: You are so excited about this new house and it is all you ever dreamed of.

However, if you fill in your personal information, you are not sure what they are going to do with it. You decide to look for some information regarding privacy. However, this page is not directly available.

To what extent are you interested in the following:

9.

Before I decide to subscribe, I want the service provider to inform me fully about the collection of subscriber profile information and how it would be used

1= Not at all interested, 2=Not very interested,
3=Neutral, 4=Somewhat interested, 5=Very interested

Not at all interested Very interested

10.

I want to control the types of products and services advertised to me as well as when and for how long advertising messages would be displayed on the screen

1= Not at all interested, 2=Not very interested, 3=Neutral, 4=Somewhat interested, 5=Very interested

Not at all interested Very interested

11.

I want to determine myself what information in my subscriber profile could be used for marketing and what could not

1= Not at all interested, 2=Not very interested, 3=Neutral, 4=Somewhat interested, 5=Very interested

Not at all interested Very interested

Section IV: You decide to subscribe and the website immediately notifies you that when you fill in your personal information, you get access to all sorts of personal benefits and services.

When looking around you see that a lot more features have changed to your personal preference and you are now able to also log-in with your tablet or smartphone.

To what extent do you agree with the following:

12.

I value Web pages that are personalized for the device (e.g. computer, palm, mobile phone etc.), browser (e.g. Netscape, Internet explorer) and operating system (e.g. Windows, Unix) that I use

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

13.

I value Web sites that are personalized for my usage experience preferences

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

14.

I value Web sites that acquire my personal preferences and personalize the services and products themselves

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

Section V: You see that funda.nl offers you a discount of 20% on rent in the first half year if you provide more personal information.

There is also a small monetary reward if you take the time to attend an open house meeting next week. A free workshop in the neighbourhood organized by one of the brokers to learn more about housing opportunities is also an extra free service. However, to take part in all of this you first have to provide more personal information.

To what extent do you agree with the following:

15.

I expect to receive monetary rewards in return for sharing my private information

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

16.

I expect to receive discount in return for sharing private information

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

17.

I expect to receive an honour such as educational opportunity (or personal coaching) in return for my private information sharing

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

Section VI: Your local broker calls you and says he has taken a look himself and has some house offers he wants to show you.

This local broker is very capable but he does not know your personal taste and you have to pay for meeting up with him.

To what extent do you agree with the following

18.

I think using this Website (funda.nl) is convenient

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

19.

I can save money by using this Website

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

20.

I can save time by using this Website.

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

Section VII: You tell your local broker you have looked at the website and it has some good offers you want to follow up on.

The local broker argues that it is not wise to respond on your own as the site will use your private data for other purposes. While you suspect he is just saying that to not lose you as a customer, he does however have a valid point as you do not exactly know how they handle your private information.

To what extent do you agree with the following:

21.

I am concerned that the information I submit on the Internet could be misused

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

22.

When I shop online, I am concerned that the credit card information can be stolen while being transferred on the Internet

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

23.

I am concerned about submitting information on the Internet because it can be used in a way I have not foreseen

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

Section VIII: You ask your best friend for advice what to do.

He tells you that if you value the perceived benefits gained from using funda.nl more than the privacy concerns you have while using this site, than you should definitely continue with the website. While deciding, you think about how much you value privacy.

To what extent do you agree with the following:

24.

I am generally unwilling to give out personal information at a web site

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

25.

I avoid using web sites that require personal information about myself before letting me use the content

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree

26.

If a web site requires registration with personal information before letting me use the content, I generally provide false information

1= Strongly Disagree, 2=Disagree, 3=Neutral,
4=Agree, 5=Strongly agree

Strongly disagree

Strongly agree