

# How does privacy perception influence online shopping behavior? - A comparison between Millennials and Generation X

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## ABSTRACT

*Purpose:* Today more and more retail stores decide to expand their businesses via the Internet. Although e-commerce is facing high growth, increasingly more consumers are concerned with privacy and security issues while shopping online.

*Aim & Method:* This paper will investigate on the influence of privacy perception on online shopping behavior by examining the difference between the two age groups, Millennials and Generation X. Privacy perceptions are therefore addressed by using the construct of perceived risk and trust. Data was obtained via an online survey, to reveal respondents risk and trust perceptions as well as their online shopping behavior. For the analysis a total of 198 respondents is used.

*Results & Conclusion:* The data revealed an effect of risk as a predictor for online shopping behavior for Millennials and Generation X. A significant negative effect for risks regarding financial information, i.e. transaction risk, can be found, to influence both generations to the same degree while engaging in online shopping. Further, risks regarding disclosure and inappropriate handling personal information in the Internet, i.e. privacy risk, are present while shopping online. However, no influence on online shopping behavior can be found for this type of risk.

*Practical Implications:* Investments in risk-reducing strategies towards safer handling of financial and personal information online are crucial for marketers to exploit the full range of online opportunities. Addressing consumers fears, but also educate them in safety enhancing steps assists in counteracting on consumers fears online.

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## Keywords

Online Shopping, Privacy perceptions, Millennials, Generation X

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# 1. INTRODUCTION

The growing connectivity via the Internet in today's society is enabling consumers around the world to use the World Wide Web for different activities in their daily lives. It provides consumers with easier means to join social networks, search for information, to engage in social communities or to purchase products online. (Lissita & Kol, 2016)

Within the Internet context, online shopping has emerged as the fastest-growing use, with an increase of sales in e-commerce of 20 percent in 2014 worldwide (Forsythe & Shi, 2003; Ben-Shabat, Nilforoushan, Yuen, & Moriarty, 2015). In the near future the e-commerce growth is expected to even overtake the growth of brick-and-mortar stores as consumers increasingly shift from traditional retail stores to the Internet as a new medium for their shopping processes (Bilgihan, Kampulli, & Zhang, 2016; Wu & Chu, 2011). This makes it increasingly interesting for e-vendors to either sell their products in a multi-channel way, by providing a combination of physical and online store or to enter the market as a pure player, like amazon.com. (Rose, Clark, Samouel, & Hair, 2012) Especially for products in electronics, fashion and apparel, books and services the Internet platform has become an increasingly popular way to buy products (Ben-Shabat et al., 2015).

Although online shopping is facing remarkable growth and an optimistic future, it is assumed that more and more consumers are facing a degree of risk while using the Internet for purchasing products (Masoud, 2013). Many consumers are concerned with the fear of personal information being lost and even accessible by other providers (Crespo, del Bosque, de los Salmones Sánchez, 2009; Alhouti, Johnson, D'Souza, 2016). These issues about privacy and security are evolving as a serious matter for online consumers (Regan, Fitzgerald, & Balint, 2016). For marketers it is therefore, crucial to be aware of consumers concerns while shopping online in order to focus their marketing strategies and actions to aid consumers and maximize the potential of e-commerce (Conchar, Zinkham, Peters, & Olavarrieta, 2004; Malhotra, Kim, & Argawal, 2004). Many researchers focus on the multidimensional issue of privacy in the context of online shopping and found a negative effect high privacy concerns on consumers' intention to buy online (e.g. Forsythe, Shi, 2013; Crespo et al., 2009; Alhouti et al., 2016; Masoud, 2013). However, few attempts have been made to provide information on the privacy perception of different age groups and the influence on their online shopping behavior. Younger generations are often described as "digital natives" (Hershatter & Epstein, 2010) with high technological skills and knowledge. By contrast, the term "digital immigrants" (Prensky, 2001) is often used for older generation, to underline their less-experienced online behavior. However, results reveal that older generations are able to keep up with online trends. They show even higher online shopping behavior in experience and expenditure than the younger generations and thus constitute an attractive customer segment for online marketers.

The increased awareness and concerns of consumers online regarding privacy and security features has resulted in a predictor for online shopping behavior within several studies. In this study the additional focus will be on age differences to reveal in how far generation-specific attributes, characteristics and technological knowledge lead to differences in privacy and security perceptions online.

This research will therefore investigate on the following research question:

*How does privacy perception influence online shopping behavior? - A comparison between Millennials and Generation X*

By studying the influence of perceived privacy perceptions on online shopping behavior, this study will reveal the risks and trust-related features consumers encounter and are influenced by while shopping online. The study is therefore aiming to assist online marketers in understanding consumer perception regarding both components and thus help them to adjust their online shops to make consumer feel safer while shopping online. Within this study the focus will further be on two generational cohorts, namely the Millennial group, representing the younger generations and Generation X, representing the older generation.

The structure of the paper will be as follows: firstly, existing literature will be analyzed and evaluated to underline main theories that are relevant for this paper. Subsequently, the research model including operationalization and methodology will be explained. To get first insights, the results of our study will be stated and used as a basis for further analysis. Findings will then be discussed and implications for theories as well as practices will be drawn before a short conclusion will sum up the whole paper.

## 1. LITERATURE REVIEW

### 1.1 Generational Cohorts

Within current literature, a range of different terms appear to subdivide age groups according to different attributes and characteristics. Terms cover generation, cohort or even generational cohort. With focusing on a particular generation, the main delimiting factor is the year of birth, typically encompassing a span of 20 to 25 years (Parment, 2013). Shared cultural or social characteristics within a generation are therefore solely based on the time range in which an individual is born (Markert, 2004). With generations focusing on birth year spans, a cohort is based on values and priorities, unique events and life courses of individuals within a specific period (Jackson, Stoel, & Brantley, 2011; Parment, 2013).

Within this study, the focus lays on the difference between Millennials and Generation X as two different generational cohorts. Both are concerned with distinct generation specific values, behaviors, and characteristics and especially with a technological focus.

The boundaries that determine a generational cohort are often random and vague (Taylor & Gao, 2014) and the birth divisions different authors are using are highly varying too. For Millennials birth year's range between 1978/79 to 1996 and 1982/83 to 2000 (Markert, 2004) to even smaller ranges from 1977 to 1988 (Reisenwitz & Iyer, 2009). Within this study the focus will be on the young Millennials within the age range of 18 to 24 years and therefore born between 1992 and 1998. For Generation X year of births range from 1965 to 1976 (Reisenwitz & Iyer, 2009) and longer periods from 1966 to 1985 (Markert, 2004). For this study the focus is on participants of Generation X within the age range of 35 to 49 years and therefore born between 1967 and 1981.

#### 1.1.1 Millennials

The names used for the younger generation, the Millennials, are widely varying within current literature as different names try to focus on different generation specific characteristics and attributes. Names like "digital natives" (Bilgihan, 2016) or the "Next generation" (Bilgihan, 2016) try to focus on the technological capabilities and environment in which members of this generation are born. Whereas the term "greatest

generation” (Hershatte & Epstein, 2010) lays the focus on them as the fastest growing segment of the population and “echo boomers” outlines them as children of the generation of Baby Boomers (Taylor & Cosenza, 2002). Within this study the name “Millennials” will be consistently used to address this generation, as discussion topics are not solely focused on them as technological experts, but also focus on behavior in online shopping.

Millennials are expected to become the most educated generation, outranking the older generations’ education level (Pew Research, 2010). They are currently either in the beginning of their career, enjoying the benefit of gaining income (Reisenwitz & Iyer, 2009) or they are in the beginning or end-phase of their studies and vocational trainings. They are seen as confident and self-expressive, with strong focus on online social interactions via social networking sites, like Facebook, Twitter and Instagram (Pew Research, 2010). By engaging in social media activities and being constantly available via the Internet, this generation is used to a constant and overloading flow of information (Parment, 2013). Independence and own thinking is essential, without depending on others in their lifestyle. They are not just taking over perspectives of older generations, but also add up and try to go their own way (Parment, 2013). Their wider thinking is created as they are grown up in a decade of increased internationalization of trade and globalization. Therefore, they are able to see social and economical problems on an international basis, without being bound to national boundaries (Parment, 2013). Their openness to change and upbeat behavior is based on technological knowledge as being grown up with information and communication technologies, like cell phones and online social networks (Pew Research, 2010; Hershatte & Epstein, 2010; Lissitsa & Kol, 2016). The Internet, for example, is also by the year of birth a member of the Millennials generation itself (Hershatte & Epstein, 2010). Millennials are seen as “leading technology enthusiasts” (Pew Research, 2010) as their daily live is mediated by digital technologies, ranging from social interaction, friendship, hobbies over the need to get information about products, services, employers, travel destination and jobs or entertainment possibilities (Parment, 2013; Jackson et al., 2011; Pew Research, 2010). Therefore, mobile devices, laptops and computers are essential for Millennials and are used in a multi-tasking way for almost every activity (Mangold & Smith, 2012; Parment, 2013). As for Millennials technology is like a sixth sense in interacting with the world (Hershatte & Epstein, 2010), they consider their Internet skills as highly sufficient to use the World Wide Web in a comfortable way (Reisenwitz & Iyer, 2009). Within the area of technological development, it is expected that Millennials are the next entrepreneurs of new innovations capitalizing Web 3.0 and further future-oriented technologies (Hershatte & Epstein, 2010).

### 1.1.2 Generation X

Within literature, Generation X is an often-overlooked generation in between the big generations of Millennials and Baby Boomers (Taylor & Gao, 2014). Generation X is described as savvy entrepreneurial loners, which currently progress in their career and overtake jobs from Baby Boomers in different economic and political areas (Taylor & Gao, 2014). They are further describes as being independent, as they are born and grown up in an often divorced family situation and in a time where it was usual that both parents work (Lissitsa & Kol, 2016). Although they are described as self-sufficient and self-reliant (Taylor & Gao, 2014), they care about viewpoints of others in order to reassure their own decisions (Lissitsa & Kol, 2016). This attitude can be seen as underlining Generation X’s

attitude towards risk avoidance, distrust and skepticism (Reisenwitz & Iyer, 2009). Regarding technologies, it is often expected that they are less experienced when it comes to digital innovations. However, literatures state that Gen Xers are digitally savvy (Peralta, 2015) with having a desire towards web and mail communication (Reisenwitz & Iyer, 2009). Within this generation members also developed popular Internet applications, like Google, Amazon and Wikipedia (Hershatte & Epstein, 2010). In its characteristics and attributes Generation X is only slightly different from other generations, as even members of this generation face the difficulty to come up with unique attributes of their generation (Taylor & Gao, 2014). This is also mirrored in literature where Generation X is randomly addressed when it comes to demographic, social and political changes (Taylor & Gao, 2014). Many researchers have difficulties to elaborate on distinctive and unique characteristics of this generation.

## 1.2 Online Shopping Behavior

The use of the Internet to shop for products has increased immensely and creates great opportunities for consumers’ shopping processes and behavior (Brown, Voge, & Popes, 2003). One main reason for consumer to buy their products online is the factor of convenience, with being able to shop wherever they are at any time as online shops are accessible 24 hours a day on 7 days a week. (Bhatnagar & Ghose, 2004; Dhanapal, Vashu, & Subramaniam, 2015; Rose et al., 2011). Further advantages are the availability and variety of products (Brown et al., 2003), the possibility of price comparison (Brown et al. 2003), cost effectiveness (Dhanapal et al., 2015) and the availability of detailed product information (Rose et al., 2011; Brown et al. 2003). However, online shopping is also concerned with disadvantages, as consumers are, for example, not able to physically examine the quality of products online (Lim, 2003; Lissitsa & Kol, 2016; Dhanapal et al., 2015). Additional disadvantages of costly or delayed deliveries, exchanges, warranty or return problems (Jia-xin, Hong-xia, & Jun, 2010) and hidden charges (Lim, 2003) further prevent consumers from shopping online. Within the online environment two types of online consumers have been identified: browsers and shoppers. An Internet browser is concerned with information search online without the direct intention to purchase the product online. However, the gathered information may impact future purchase decisions (Moe, 2003). On the other hand a shopper is someone who actually makes a purchase on the Internet (Forsythe & Shi, 2003).

### 1.2.1 Online Shopping in Germany

In Germany 51 million people represent the digital consumer base, which make Germany employing one of the greatest e-commerce customer potential within Europe (Späth, 2015). Also on a global scale, Germany enjoys high potential, reaching the fifth rank based on its online market attractiveness (Ben-Shabat et al., 2015). Regarding further developments in the German online retail market a growth rate of 12 percent yearly is expected until 2017. More and more brick-and mortar stores are expected to enter the online market, either as pure-players or by partnering with established online retailers (Ben-Shabat, Nilforoushan, & Moriarty, 2013).

Regarding the online shopping behavior of German people, it is stated that the average German spends 1 ½ hours per day on the Internet to buy products (Ben-Shabat, et al., 2013). A consumer is further concerned with making 19 purchases in a year, reaching an expenditure of 1,200€ per year (Späth, 2015). In addition, the main product categories bought via the Internet are electronics, fashion and apparel, books and services (Ben-

Shabat et al., 2015). However, consumers do not only focus on purchasing products itself, but are also highly experienced in researching and the use of price comparison sites (Ben-Shabat, et al. 2013). At the moment the online market in Germany is dominated by younger generations, however the rise of older people entering the online market is detected. Especially the older generations' high purchasing power is making them an important target group for the e-commerce industry (Späth, 2015).

### *1.2.2 Online shopping behavior of Millennials and Generation X*

Within the field of Online Shopping, Millennials possess significant purchasing power, mainly reason from their sizeable amount of generation participants (Parment, 2013; Mangold & Smith, 2012). This makes Millennials an important target audience for many consumer industries (Parment, 2013; Mangold & Smith, 2012). The purchasing power of Millennials is even expected to increase in the future when they enter the workforce and gain increasing amount of money (Bilgihan, 2016). At the moment most of the Millennials are still in school and only a few are already employed (Lachman & Brett, 2013). Generation Xs online presence is often underestimated by online marketers due to their significantly fewer generation participants (Peralta, 2015). Although they cannot impress through a hefty size in participants, Gen Xers possess high financial power and stability, as they are in the workforce for years and further develop their careers (Peralta, 2015; Reisenwitz & Iyer, 2009). This is additionally recognizable in their financially supporting behavior towards their grown-children and parents (Peralta, 2015). Regarding online shopping behavior, Millennials are mainly focusing on products and brands that are in line with their personality, lifestyle and values (Ordun, 2015). They are targeting up-to-date products that match newest trends by constantly checking out celebrities and popular blogs to keep up in fashion and lifestyles (Lachman & Brett, 2013). Linked to this, Millennials invest a lot of time in researching in order to gain considerable knowledge about latest updates about products and brands online (Ordun, 2015). Another important information source for Millennials are online recommendations and product or vendor reviews, which influence them in their actual purchase behavior (Mangold & Smith, 2012). Besides of using them for their own purchases, Millennials are engaging in creating and sharing recommendation online and are assisting in the creation and marketing of consumer goods (Hershatter & Epstein, 2010). Their open online behavior and information exchanges underline their continuous access to digital media, since they are highly driven by opinions of friends and users in the virtual world (Ordun, 2015). For Gen Xers there is far less concern about products to display their status or lifestyle (Peralta 2015). However, reading and visiting recommendation sites to reassure their purchase decisions is also essential for this generation (Lissitsa & Kol, 2016). Additionally, to make this online shopping generation feel more secure in their purchase decision, a clear explanation of products and transaction processes is beneficial (Peralta, 2015). In case Millennials decided for a product of their choice their focus lies on the most efficient way to get their product delivered (Parment, 2013). Choosing a channel and retailer is therefore based on either the lowest price or highest convenience (Parment, 2013). Millennials display very limited loyalty towards brands, possibly stemming from their trend switching behavior and their constant exposure to high amounts of promotions and brands advertisements (Ordun, 2015). Participants of Generation X value high-quality products within the online shopping context (Lissitsa & Kol, 2016).

Personalized offers that show that online vendors acknowledge consumer specific differences are therefore of greater value and create a personalized brand experience (Peralta, 2015; Lissitsa & Kol, 2016). In order to make sure that online vendors are not using deals for their own sake but in the best way for the customer, information research and trust-assuring information is crucial for this generation (Ordun 2015). This is a behavior that underlines their attitudes towards risk avoidance within the online setting (Reisenwitz & Iyer, 2009). For marketers to counteract on Gen Xers low capacity for risk, relationship-enhancing behavior is necessary by offering high-quality products and personalized and unique promotion messages (Peralta, 2015). As they are requesting this personalized focus of online marketers, Gen Xers they still feel ignored by marketers, companies and brands, thinking that they are not aware of their specific needs and personage (Ordun, 2015). Marketers are currently more focusing on marketing Millennials with investing in social media campaign as well as promotion activities with celebrities and blogger as these generation prefers ads in others forms than traditional media (Valentine & Powers, 2013).

## **1.3 Privacy Perception**

Several studies underline that a huge amount of individuals have strong privacy concerns while using the Internet (Belanger, Hiller, Smith, 2002). Overcoming and counteracting on these concerns is therefore seen as main hurdle to enable growth in e-commerce (Belanger et al., 2002). Elements of the optimum use of privacy and security features in combination with trustworthiness are seen as main supporting factors to support this e-commerce growth (Belanger et al., 2002).

Privacy can be defined as the "willingness of consumer to share information over the Internet that allows purchases to be concluded" (Belanger et al., 2002, p.248). While privacy concerns are seen as a rising topic within the Internet context the perceptions and knowledge about privacy differ extremely among consumer themselves (Alhouti et al., 2016). Addressing the terms of risks and trust in the following part will help to further elaborate privacy concerns within the e-commerce setting.

### *1.3.1 Perceived Risk*

Within the online shopping context, risks are identified on another level as in traditional brick-and-mortar stores. With shopping in brick-and-mortar stores consumers have the opportunity to base and judge vendors on physical presence and face-to-face signals, like personal communication, but also quality signaling factors like the store's appearance and location (Özpolat, Gao, Jank, & Viswanathan, 2013). When shopping online customer may be highly exposed to a sense of risk, which is significantly higher compared to traditional shopping (Kim, Ferrin, & Rao, 2008). Therefore, within the context of online shopping, several researchers define perceived risks according to the new digital environment consumers are operating in to buy their products. Customers perceive uncertainties, which can either be in form of the output itself or the possible side effects of purchasing a product online (Bhatnagar & Ghose, 2004). In addition, online risk is about the loss a consumer could encounter while focusing on a desired outcome from shopping online (Masoud, 2013). Many authors conceptualize perceived risk as a multidimensional character (Crespo et al., 2009). Therefore recent studies propose and address different dimensions of perceived risk, financial risk, performance risk, social risk, psychological risk, time/convenience risk and privacy risk are examples of risk addressed (Crespo et al., 2009). In the setting of online shopping six risks are said to be predominant: time/convenience

risk, privacy risk, source risk, concerns of delivery, transaction security risk and customer service risk (Lee & Moon, 2015). As within this paper the focus is on privacy issues, this study will concentrate primarily on privacy risk, source risk and transaction security risk.

Privacy risk is concerned with personal information provided during online transactions and fear of losing the control over given information (Crespo et al., 2009). In order to purchase online consumer have to expose various personal data, like address and phone number (Kim et al., 2008). Whenever consumers provide this private information they can only hope that e-vendors will handle their data accurately and safely. The way information will be used can neither be predicted nor controlled (Kim et al., 2008; Glover & Benbasat, 2010). As “data is transmitted over open lines” (Bhatnagar & Ghose, 2002) on the Internet personal information can often easily be accessed and stolen by hackers in the Internet environment (Lim, 2003). E-vendors are often unable to assure full security of private information, thus hackers can access this data. This might lead to data being distorted or disclosed for often-dangerous purposes, like identity-theft (Jia-xin et al., 2010; Featherman & Pavlou, 2003). Another risk, consumers encounter in providing personal information online is the fear of e-vendors selling or exchanging customer information with third-parties (Lim, 2003). Then, private information will be used for purposes others than just the initial purchase transaction the customer engaged in. Risk regarding personal information being disclosed, transmitted, stored and protected is fully under the responsibility and control of the e-vendor. Thus, online consumers are unaware of any disclosure and exchange of their data that might be occurring (Glover & Benbasat, 2010).

Source risk is defined as the likelihood of purchasing a product from an untrustworthy e-commerce website (Lim, 2003). The risk of fake stores is apparent in the online setting where “deceitful vendors disappear overnight and do not deliver products or services” (Lim, 2003). The creation of new online shops on the Internet is easily possible creating the risks of e-vendors that portray themselves as high-quality seller masquerading their real low-quality shop is posing high risk on online consumers (Özpolat et al., 2013). For consumers it is often difficult to assess the reliability and credibility of a website (Cases, 2002).

Transactional security risk is focusing on the “manner in which transaction are conducted over the Internet” (Bhatnagar & Ghose, 2002). Consumers encounter different benefits while shopping online, however with providing financial and personal data to make a purchase online consumers associate a negative effect on their online shopping experience (Forsythe, Liu, Shannon, & Gardner, 2006). The fact that usually consumers have to pay before the delivery of the purchase is even increasing this uncertainty (Jia-xin et al., 2010). Although the use of credit cards is a common payment method in online shopping (Lim, 2003), consumers are often reluctant to provide their credit card number as they fear their information to be misused (Bhatnagar & Ghose, 2002). This fear about the misuse is not only based on the e-vendor himself, but also on the possibility of hackers stealing credit card details, which may cause potential monetary losses for consumers (Lim, 2003).

### 1.3.2 Perceived trust

Within both the online shopping as well as the offline-shopping context, trust is an important factor. However, several studies recognize the particular importance of trust in the online shopping context (Gefen, Karahanna, & Straub, 2003). In the offline setting of buying products in brick-and-mortar stores

consumer are able to base their trust on social cues, including voice, appearance, visual and behavioral cues (Gefen et al., 2003). Nevertheless within the online setting consumer face a highly complex virtual setting without being able to engage in face-to-face interactions. Therefore, dealing with e-vendors demands high level of trust in the online environment. (Ou & Sia, 2010). Trust is seen as fundamental driver for a successful e-commerce. This is why creating trust is necessary to prevent reluctance of consumers to make transactions online (Kim et al., 2002). Trust in the online setting is defined as a consumer’s willingness to be vulnerable while relying on the selling party to act in accordance with transactional obligations (Kim et al., 2008; McKnight, Choudhury, Kacmar, 2002). In order to understand and test the relation between trust and perceived privacy the focus will be on the model proposed by Kim, Ferrin, and Rao (2008). The authors suggest a division of trust into cognition-based, affect-based, experience-based and personality-based trust.

Cognition-based trust is “associated with consumers’ observations and perceptions [...] regarding features and characteristics of the trustee entity” (Kim et al., 2008). In specific information quality, perceived privacy and security protection are the main factor affecting cognition-based trust for online consumers. Information quality is concerns the quality of content provided about products, transaction processes and the ability to easily access privacy policies (Gefen, Benbasat & Pavlou, 2008). As online consumers are often worried about hidden charges and misrepresentation of products providing detailed and easily accessible information helps consumers to create trust in a website or an e-vendor (Gefen et al., 2008; Lim, 2003). In order to further enhance trust protection, mechanisms in security and privacy are further seen as crucial and essential for e-vendors (Gefen et al., 2003). The availability of understandable and easily accessible privacy policies are fundamental to increase the trustworthiness of a website (Lim, 2003). Research suggests that consumers read privacy policies only 10% of the time, and if they do so they often only shortly look at the first two policies mentioned. However, consumer fear their privacy if privacy policies are not provided or difficult to find (Lim, 2003).

Affect-based trust relates to experience reports from other users, who already interacted with the vendor, or third-party certification agencies (Kim et al., 2008). Online customer reviews evolve as a key factor in providing information about features of online shops and are therefore affecting the decision making process of consumers about purchasing products online (Elwalda, Lü, Ali, 2016). Employing such reviews on a company’s website enables consumers to spread their experiences and knowledge about specific e-vendors and online transaction, easily reaching a wide range of people online (Mangold & Smith, 2012). Therefore, reviews as sort of social proof are seen as a confident source of qualitative information that enhances consumer trust (Seckler, Heinz, Forde, Tuch & Opwis, 2015). Researchers also found that online consumers are influenced by recommendation of friends and family as a sort of friend’s social proof (Seckler et al., 2015). Information and references from colleagues, friends and family members are seen as reliable source of information to avoid trial and error by relying on the information provided by others (Seckler et al. 2015; Lim, 2003). Another way to enhance consumer trust is to invest in third-party seals, which underline that a e-vendor meets certain privacy, security and quality standards (Özpolat et al., 2013). With employing such third-party seals e-vendors are able to persuade online consumers of their trustworthiness and quality of their online shop. (Özpalat et al., 2013). They create a belief in consumers that the e-vendor are willing to engage in

relationship-enhancing behavior, as they invested efforts to acquire a specific certification. (Ou & Sia, 2010). Embedding the TRUSTe logo, for example, underlines that the e-vendor employs privacy policies that handle consumer's private data in a confidential and secure way. (Özpalat et al. 2013). In comparison, the VeriSign logo ensures that websites use safe payment methods by using digital certificates and Secure Sockets Layer (SSL) connection (Özpalat et al., 2013). Experience-based trust is addressing the personal practice and knowledge consumers possess within the Internet shopping context in general. Personality-based trust focuses on the specific online shopping styles that evolve for consumers while shopping online. Within this model, experience-based and personality-oriented trust dimensions are expected to not influence privacy perceptions. Therefore, they are not directly included in this study. However, will be slightly addressed in the methodological part when focusing on the frequency of purchases and the experience within the online setting.

## 2. CONCEPTUAL MODEL

The research question: *How does privacy perception influence online shopping behavior? - A comparison between Millennials and Generation X* will be analyzed and categorized in the parts highlighted in the following figure.

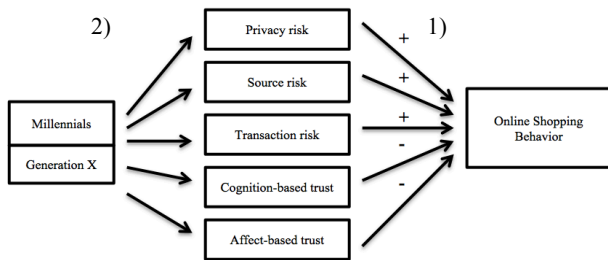


Figure 1: Conceptual model

Key concepts within this study are defined as the variables of “age”, “perceived risk”, “perceived trust” and “online shopping”.

Within this model age is the dependent variable and will be focused on by examining the differences of two generational groups, namely Millennials and Generation X.

“Perceived risk” and “perceived trust” will therefore be placed as dependent variables with aiming at revealing privacy perception of both age groups and to further analyze its effects

on online shopping behavior. As stated in literature, risks in e-commerce are present in multiple ways with all focusing on losses that consumer might encounter while engaging in online shopping activities. Thus, a negative relationship of all three risk types on online shopping behavior is assumed. In contrast perceived trust is expected to enhance online shopping behavior with consumers increasing their trust based on either cognition-based features or affect-based features. Thus, a positive relationship between trust and online shopping behavior is assumed.

The variable of “online shopping behavior” acts as a second dependent variable, again to detect generation specific difference for Millennials and Generation X.

The following questions will further help in underlining the structure of the survey and assist as a guide throughout the study:

(1) *How does the perception of risk and trust influence online shopping behavior?*

(2) *How do Millennials and Generation X perceive risk in the online shopping context?*

(2) *How do Millennials and Generation X perceive trust in the online shopping context?*

(1 + 2) *How does the perception of risk and trust influence online shopping behavior - compared for Millennials and Generation X?*

## 3. OPERATIONALIZATION

In table 1 the definitions, question items and sources for the dependent variables are summarized. The survey was created in group work, strongly elaborating each question segments to make sure constructs are addressed with appropriate and focused question items. The questionnaire is based on the former literature and its outcomes. Therefore, constructs are based on online shopping behavior, privacy behavior and both, the elements of risk as well as trust. The questionnaire is divided in five parts. The first part covers general demographic information about age, gender, nationality, occupation and education, the second part addresses general online shopping behavior, the third part asks about consumer's privacy behavior online, the fourth part is explicitly designed for this research with specialized question items aiming on revealing the perception of different risk types on the internet, the same counts for part five where different types of trust-related feature of online shops are addressed.

Table 1: Construct and Item Description

Construct	Definition	Question Item	Source
<b>Privacy risk</b>	Perceived risk about personal data being handled inappropriately by the vendor and the accessibility of the data by third parties or hackers	Risk_1_1: I believe that my personal information is protected during online shopping Risk_2_1: I am aware that my private data can be given to 3rd parties by online shopping sites Risk_3_1: I am aware that advertisement is based on my prior searches and shopping behavior Risk_4_1: I receive newsletters/emails from online shops I did not register for	Lee & Moon, 2015
<b>Source risk</b>	Perceived risk that the online shop is fake untrustworthy	Risk_5_1: The possibility that online shops are fake is high Risk_6_1: The possibility that my online purchase will not be delivered is high Risk_7_1: I buy from online shops without a physical store	Lee & Moon, 2015
<b>Transaction risk</b>	Perceived risk that online shops save and use financial data inappropriately, sell the data or hacker stealing the information	Risk_8_1: I am afraid to use my credit card online Risk_9_1: The possibility that hackers will steal my credit card information is low Risk_10_1: The possibility that my credit card information is sold to third parties is high Risk_11_1: In general I trust mainstream online payment methods	Lee & Moon, 2015
<b>Cognition-based trust</b>	Perceived trust based on information quality and security aspects of an online shop	Trust_1_1: The product information I get in online shops is complete and understandable Trust_2_1: Privacy policies in online shops are easily accessible and understandable Trust_3_1: I expect mainstream online shops to fulfill basic digital security protection(s)	Kim, Ferrin, & Rao, 2008
<b>Affect-based trust</b>	Perceived trust based on opinion from third parties (friends, family, but also review and certification agencies)	Trust_4_1: I check for safety logos and certification (e.g. trusted e-shops) in online shops before I purchase Trust_5_1: I ask friends and family for recommendations of an online shop before I purchase Trust_6_1: I read reviews of an online shop before I purchase	Kim, Ferrin, & Rao, 2008
<b>Online Shopping Behavior</b>	A heavy shopper is someone who buys often, spends a lot of money, buys different type of products and uses different payment methods	Online_Shopping_7: How often did you shop online in the past year? Online_Shopping_9: How much money do you spend on average per month for online shopping in Euros? Online_Shopping_8_1-12: What type of products do you usually buy online? Online_Shopping_9_1-12: Which online payment methods do you know and use?	Own definition formulated for this study



The structure of the answers mainly consists of a 7-point Likert-scale, ranging from either “totally disagree” to “totally agree”, whereas for questions aiming at frequencies, the scale range from “never” to “always. In addition questions with multiple answers and questions with given answer possibilities are used to gain information about the individual shopping behavior.

## 4. METHODOLOGY

### 4.1 Data collection

In order to collect data for this research, an online survey is created, through Qualtrics, a provider for online survey constructions for the research done by students. The survey is sent via e-mail and social media, including direct messages, Facebook group postings as well as posts on the authors’ social media profiles to reach a wide range of people online. As the survey is also adjusted to mobile phone usage a further distribution via personal messages and group posting in messaging provider WhatsApp was conducted. The survey responses were collected on an anonymous basis. In total people were able to answer the survey for 20 days, with the survey being activated on the 5<sup>th</sup> May 2016 and closed on the 24<sup>th</sup> May 2016. In the end of the survey the possibility to voluntarily provide a e-mail address is provided, for respondents who are interested in the results of the survey. Data will therefore be summarized and displayed in an easily understandable way and send to respondents after the completion of this research.

In total 856 respondents started the survey, with 789 being completed and therefore useful for the analysis.

The research question will be measured based on respondents from Germany within the age group of 18 to 24 (Millennials) and the age group of 35-49 (Generation X). Therefore, a total of 198 survey respondents are valid and used for further analysis.

### 4.2 Sample Statistics

The total sample size for the two age groups is 198. 64.1% (N=127) belong to the group of Millennials and 35.9% (N=71) belong to the group of Generation X. The sample can therefore be treated as equally distributed between both age groups. Within the group of Millennials all age possibilities are represented with a mean of 20.13, however a high amount of respondents are 18 years old (39.4%; N=50). Respondents belonging to the group of Generation X show an almost equal distribution among all their age range with a mean of 42.58.

In both age groups the majority of all respondents is female. Female respondents for the Millennials age group counted to 70.1% (N=90) with 29.9% (N=37) being male. Within the age group of Generation X 73.2% (N=52) of respondents are female and 26.8% (19) are male.

Information about current occupation reveal that for the Millennials the majority of 81.9% (N=104) are currently in their studies, 17.3% (N=22) are employed and one respondent is currently self-employed (0.8%). Within the age group of Generation X, 74.6% (N=53) are currently employed with 12.7% (N=9) being self-employed, 5 respondents currently stay-at-home (7%), two respondent are unable to work (2.8%), one respondent is currently studying (1.4%) and one is unemployed (1.4%).

### 4.3 Validity

Validity is a measure that indicates whether an instrument measures what it initially set out to measure (Field, 2009). Within this study the variables of perceived risk and perceived trust are categorized in different constructs (see operationalization for further information). In order to ensure

that the proposed question items measure the construct they are intended to measure, a factor analysis is conducted.

Within a first factor analysis based on Eigenvalue of each item all question items for perceived risk and perceived trust are included. The analysis shows a negative loading for trust\_1\_1, trust\_2\_1 and trust\_3\_1 indicating that these items need to be deleted for further analysis. All three-question items intended to measure the construct of cognition-based trust; therefore the construct will be deleted for the analysis. An explanation for the negative loading could be that respondents were not able to specify their answers for website attributes, design and information quality on a given online shop or website, as no specific website or online shop was proposed within the questionnaire. The analysis further reveals that risk\_1\_1 and risk\_4\_1 do not display any strength for a given construct and will therefore be rejected for further analysis. Risk\_7\_1 is further rejected as the question intends to measure actual risk instead of perceived risk. Although a few items are rejected for further analysis, with deleting those question items the research increases in internal validity.

A second factor analysis based on Eigenvalue for each item, including the remaining question items is conducted. The analysis shows a KMO of .626 indicating that the strength of the relationship is strong and the sample size is adequate to conduct a factor analysis (Field, 2009). The Bartlett’s test of Sphericity further indicates a significance ( $p < .001$ ), showing that correlations are large enough to proceed.

Table 2: KMO and Bartlett’s Test of Sphericity

<i>KMO and Bartlett's Test</i>			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.626
Bartlett's Test of Sphericity	Approx. Chi-Square	341,839	
	df	55	
	Sig.		.000

The Rotated Factor Matrix (table 3) validates the used items, as risk and trust items are loaded onto different factors. As risk\_10\_1 shows loading on a second construct with almost the same loading for both constructs, it will be used for construct 1 as it is intended to measure the same risk as risk\_8\_1, risk\_9\_1 and risk\_11\_1. Almost all questions show a loading higher than 0.5 or 0.6. Although risk\_6\_1 and trust\_4\_1 have a loading smaller than 0.5 both items will be kept for the analysis, because of their importance for this research.

Table 3: Rotated Factor Matrix

	<i>Rotated Factor Matrix<sup>a</sup></i>			
	Transaction risk	Affect-based trust	Privacy risk	Source risk
Risk_11_1	.659			
Risk_9_1	.611			
Risk_8_1	.563			
Trust_5_1		.708		
Trust_4_1 ;		.576		
Trust_6_1		.447		
Risk_3_1			.747	
Risk_2_1			.693	
Risk_5_1				.506
Risk_10_1	.348			.358
Risk_6_1				.301

Extraction Method: Principal Axis Factoring.  
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

### 4.4 Reliability

Reliability refers to consistency of an instrument with the ability to be interpreted in the same way among a range of

different situations (Field, 2009). In order to test the research constructs on their reliability, Cronbach's alpha is used, a popular method to objectively measure the reliability (Tavakol & Dennick, 2011).

Table 4: Model Reliability Index: Cronbach's Alpha

Construct	Cronbach's alpha	N of Items
Perceived risk	.603	8
Privacy risk	.645	2
Source risk	.488	2
Transaction risk	.653	4
Perceived trust	.568	3
Affect-based trust	.568	3

The results represented in the table 4 show a good and sometimes moderate internal consistency among the items used. The item total statistics suggest an increase of Cronbach's alpha for perceived risk from .603 to .629 so that the question item risk\_3\_1 would have had to be deleted. However, it is decided to keep the item because of its only marginal increase and its importance for further analysis. All other items stay in the study, as Cronbach's alpha will not increase with the further deletion of items.

## 4.5 Results

### 4.5.1 Online Shopping Behavior

Firstly, to get an overview about the general online shopping behavior of Millennials and Generation X, questions are addressed to reveal their (1) experience, (2) shopping types and (3) general opinion about online shopping. Independent-T-tests as well as frequency tests are used to reveal differences and similarities between both generations.

#### 4.5.1.1 Experience

The results indicate a significant difference in the general use of the Internet ( $p=.005$ ). Millennials show a more frequent use of the Internet than Generation X. Regarding the experience in online shopping, a significant difference is revealed ( $p>.001$ ). Generation X is using the Internet as a shopping tool for a longer period already.

#### 4.5.1.2 Shopping Types

There is a statistical difference in the overall shopping behavior between both generations ( $p=.17$ ). Generation X can therefore be described as heavy shopper and the Millennials as moderate shopper. The difference between both generations is revealed in the expenditure for online shopping and the types of different product categories bought. A significance difference in online expenditure ( $p=.008$ ) reveals that Generation X is spending more money online than Millennials. In addition, the difference in the number of product categories bought online shows a significance ( $p=.008$ ) with Generation X buying a higher variety of product types online. Nevertheless, regarding the main product categories bought, fashion, electronic & software and books, music & movies were rated most often by both generations.

#### 4.5.1.3 Advantages and Disadvantages

The general opinion about shopping online is revealed by ratings on motivating and preventing factors for online shopping. Millennials mainly see the advantage of convenience (66.1%), the variety of products and brands (65.4%) and the availability of better prices (63%) when shopping online. Generation X's motivation mainly lies in the convenience factor (78.9), better prices online (63.4%) and the possibility of price comparisons (57.7%). The preventing factors display a

similarity between both generations. Both Millennials and Generation X rated the lack of physically examining the product and high delivery costs most often. Thus, results reveal an overall same opinion of the generations regarding online shopping.

### 4.5.2 Privacy Perceptions

Within this study, privacy perceptions are measured in perceived risk and perceived trust. Regarding the overall value for privacy perception there is no statistical difference between both generations ( $p=.659$ ). Furthermore, both generations have moderate privacy perception within their online shopping behavior.

In addition there is no difference between Millennials and Generation X in their perception of risk and trust ( $p_{risk}=.127$ ;  $p_{trust}=.235$ ). Both generations have a moderate perception of risk and trust while shopping online.

#### 4.5.2.1 Perceived risk

Perceived risk is measured in different types of risk: (1) privacy risk, (2) source risk and (3) transaction risk. The results of the linear regression model show that for both generation privacy risks is the most perceived risk, followed by transaction risk and source risk.

The results indicate a statistically significant difference for privacy risk ( $p=.004$ ), where Millennials perceive more privacy risk than Generation X. The results suggest that there is no significant difference for perceived source and transaction risk. ( $p_{source}=.326$ ;  $p_{transaction}=.370$ ). Both generations perceive these risk types to the same degree while shopping online.

#### 4.5.2.2 Perceived Trust

The perception of trust is measured in affect-based trust. The results indicate no significant different in affect-based trust ( $p=.235$ ). Therefore, both generations perceive this type of trust to the same degree while shopping online.

## 5. DATA ANALYSIS

### 5.1 Correlations

The finding of the correlation table can be summarized as follows: (see Appendix 1)

- Age has a weak negative correlation with privacy risk,  $r(196)=-.163$ ,  $p=.022$
- Age has a weak positive correlation with online shopping behavior,  $r(196)=.168$ ,  $p=.018$
- Gender has a weak positive correlation with perceived risk,  $r(196)=.188$ ,  $p=.008$
- Gender has a weak positive correlation with source risk,  $r(196)=.184$ ,  $p=.010$
- Perceived risk has a weak negative correlation with online shopping behavior,  $r(196)=-.188$ ,  $p=.008$
- Transaction risk has a weak negative correlation with online shopping behavior,  $r(196)=-.290$ ,  $p<.001$

The results of the correlation table indicate no strong correlation between the dependent and independent variables, as no correlation is above 0.8. Testing for the control variable did not result in a strong correlation between control variable and the independent as well as dependent variables in this study.

### 5.2 Regression Analysis

In order to analyze the predictive effect of perceived risk and perceived trust on online shopping behavior a regression analysis is conducted. (see Appendix 2 and Figure 2: (in)significance model, dotted lines indicate that there is no significance, straight lines highlight a significance).



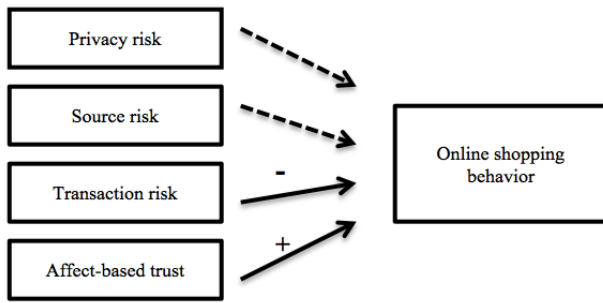


Figure 2: (In)significance model

A significant regression equation is found,  $F(4,193)=5,354$ ,  $p<.001$ , with an  $R^2$  of .100. This means that the different types of perceived risk and perceived trust can explain 10% of the variance in Online Shopping. This further implies that there might be many factors explaining variances in online shopping behavior. The used model, which includes perceived risk and trust, however, can explain approximately 10% of it (Field, 2009).

From the coefficient table it can be stated that  $b_0$  is 2.829, which indicates that without the influence of the perceived risk and trust types, online shopping behavior would be 2,829 (measured on a scale of 1 to 5).

The results reveal that transaction risk significantly predicts online shopping behavior ( $b=-.181$ ,  $p<.001$ ). The value of beta further indicates a negative effect of transaction risk on online shopping behavior.

For privacy risk as well as for source risk no predictive effect on online shopping behavior is revealed ( $b_{\text{privacy}}=.42$ ,  $p=.286$ ;  $b_{\text{source}}=-.030$ ,  $p=.573$ ).

The results indicate a predictive effect of affect-based trust on online shopping behavior. ( $b=.094$ ,  $p=.021$ ) The statistics further underline a positive relationship between affect-based trust and online shopping behavior.

Both significant predictors found underline the assumed influence on online shopping behavior, with risk decreasing someone's willingness to shop online and trust increasing online shopping behavior.

### 5.3 ANCOVA

A One-Way ANCOVA is conducted to determine a statistically significant effect between Millennials and Generation X on online shopping behavior controlling for the perceptions of risk and trust. (see Appendix 3)

The results indicate a significant main effect of age on online shopping behavior after controlling for transaction risk,  $F(1,188)=13,368$ ,  $p<.001$ . There is a negative effect of transaction risk on online shopping behavior,  $B=-.257$ ,  $SE_B=.089$ ,  $t=-2.872$ ,  $p=.005$ . However, there is no significant interaction effect of transaction risk,  $F(1,188)=1,233$ ,  $p=.268$ . Therefore, the effect of transaction risk on online shopping behavior is the same for both generations. The results for privacy risk and source risk show no significant effect on online shopping behavior for both generations ( $F(1,188)=2,949$ ,  $p=.088$ ;  $F(1,188)=.970$ ,  $p=.326$ ).

There is no significant effect of trust on online shopping behavior for both generations,  $F(1,188)=3,656$ ,  $p=.057$ . This indicates that the effect of affect-based trust on online shopping behavior disappears as soon as the different age groups enter the model.

### 5.4 Independent T-Test Privacy Behavior

This study aims to reveal privacy perceptions of Millennials and Generation X while shopping online. It is furthermore compelling to observe, if their privacy perception go in line with their actual privacy behavior, i.e. what both generation do by themselves to increase their privacy online. Privacy behavior is measured with questions addressing their use of e-mail addresses and passwords and the way they are influenced by and handle privacy policies and terms and conditions while shopping online. The statistics of an Independent T-test to reveal the differences in privacy behavior between both age groups show a significant difference ( $t(196)=-4.757$ ;  $p<.001$ ). The results further indicate that Generation X is engaging more in protecting their privacy online than Millennials do. (see Appendix 4)

### 6. DISCUSSION

The following figure highlights the main results of the analysis, which will be further discussed in the following part.

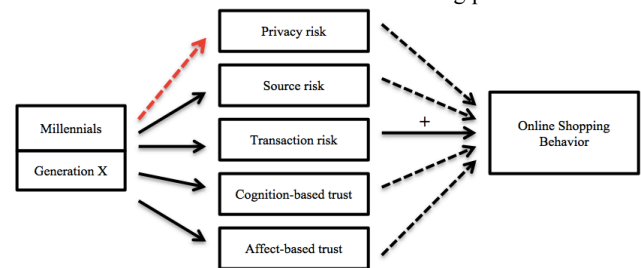


Figure 3: Model of main outcomes

This study aims to identify the influence of perceived risk and perceived trust on online shopping behavior compared between Millennials and Generation X.

The results of the analysis suggest that transaction risk is the only predictor for online shopping behavior that is stable over the different age groups. The influence of affect-based trust, as a predictor for online shopping behavior seems to disappear with adding the different generational age groups, as there is no significant influence found in the results of the ANCOVA analysis.

**1. Main outcome:** As a first overall outcome of this study, risk can be seen as the only predictor for online shopping behavior that remains stable as soon as the variable of age is added to the analysis.

The reason for trust being rejected as a predictor for online shopping behavior may be that within the online shopping context risks seem to be even more present, and maybe even trust related feature, like reviews and recommendations are not able to overcome these risks. Kim, Ferrin and Rao (2008), for example, state that for trust to be created by consumer, a website needs to employ a wide range of different trust-related features to address their trust perceptions. This implies that a lot of effort is needed to create trust in order to influence online shopping behavior.

A closer look on the influence of transaction risk on online shopping behavior indicates that there is no interactive effect and consequently both generations are influenced by transaction risk to the same degree.

**2. Main outcome:** Thus, as a second main outcome of this study transaction risk is the only predictor for online shopping behavior for both generations.

Our findings go in line with current literature, as transaction risk has been resulted as a predictor for online shopping behavior in several studies (Lee & Moon, 2015; Masoud, 2013).

Transaction risk is concerned with direct financial losses consumers encounter while shopping online. Thus, this can be seen as a reason, explaining why both generations are influenced by this risk in their online shopping behavior. Our demographic results show that most of the Millennials are still in their studies and although some are already gaining their first incomes (Reisenwitz & Iyer, 2009), they are often still dependent on their parents regarding financial aid. Therefore, the fear of financial loss is very present for this young generation. Generation Xers earn money and are in their careers for a longer time already (Taylor & Gao, 2014). However, as our results show, their online expenditure is higher, therefore, financial losses do impact them as a bigger amount of money may be lost.

For privacy risk no significant effect on online shopping behavior results from the analysis. However, it becomes obvious that privacy risk is the most perceived risk of both generations while shopping online. Therefore, although privacy does not influence their online shopping behavior, both generations perceive this risk the most while shopping online.

**3. Main outcome:** *As a third main outcome of this study privacy risk is the main perceived risk while shopping online for both generations.*

Our outcome, goes in line with the current literature, where privacy issues are identified as being key concerns for online users, however did not find a predictive power for online purchase rates or purchase intentions ((Miyazaki & Fernandez, 2001, Fodor & Brem, 2015). A reason for privacy risk being the most perceived risk while shopping online without affecting online shopping behavior may be that this risk is the most present, but least estimable risk in the online environment. When personal data is lost or stolen on the Internet, consumers cannot really estimate what is really happening with their data (Lim, 2003; Kim et al., 2008). Data handling and theft in the World Wide Web happen behind most consumers' knowledge. Data is transmitted over open lines and stored at places where consumers are not aware of. This is a situation that many consumers fear as their control over own personal data is lost as soon as data is made accessible for third parties (Jia-xin et al., 2010; Featherman & Pavlou, 2003). However, consumers might feel no direct loss, like it is the case with financial risks. The only way they encounter such data handling on the Internet maybe through spam E-Mails or newsletters they did not subscribe for. The results further indicate that Millennials perceive privacy risk even more than Generation X does. The fear of privacy risks being even more present for Millennials may result from their consciousness of the Internet, having accounts in Social Media networks, where the risk of privacy being sold may be even more present (Parment, 2013; Pew Research, 2010).

Source risk shows no significant influence within both analyses and is therefore not seen as a predictor for online shopping behavior for both generational groups. A reason for source risk showing no effect on online shopping behavior may be that Internet browsers are already advanced in detecting fake online shops and thus, prevent consumers to come in contact and buy from such stores.

As a last step, privacy behavior of respondents was addressed to reveal, if their online behavior fits their perception of risk. The results indicate that both generations are in the same way influenced by transaction risk while shopping online, however it seems that Generation X is investing more efforts to increase their online safety.

Although Generation X is said to be technological savvy than expected by many authors, their need for safety online is still

higher than for the younger generations. This further underlines that Generation X attitude towards risk avoidance, distrust and skepticism is still present in the digital environment, although they are improving in technological knowledge (Reisenwitz & Iyer, 2009). A reason for Millennials investing less effort in protecting their privacy online may be that they see their technological edge towards older generations and consider themselves as very satisfied with their Internet skills (Reisenwitz & Iyer, 2009). This is a judgment that makes them feel too safe on the Internet, although it seems that they know less about online privacy regulations. (Hoofnagle, King, Li, & Turow, 2010). Further, as this generation is often still under the supervision of parents and family, they tend to rely on others, without accepting responsibilities for their own behavior.

## 6.1 Practical Implications

The Internet is displaying huge opportunities for retailers and suppliers to sell their products to a wider range of consumers online. However, a huge amount of potential e-commerce customers is still lost due to low transparency of security and privacy protection of websites.

Within the Internet environment online marketers tend to focus their promotion strategies on the younger generations. The reason for this is that the Millennials high Internet usage and presence in social media highlights the possibility for marketers to reach them via online marketing campaigns. However, based on the results of this study, a first advice for marketers is to widen their view and also focus on older generations in online promotion activities. The Generation X is able to catch up in experience and also displays an interesting target audience for online vendors due to their high online expenditures. Likewise, for Millennials a strong focus on online promotions is still advisable, whereas for Generation X a mix of online and offline marketing tools may be applicable. Although they show high experience in online shopping, they are not as connected to the Internet as Millennials are. Further, in order to get the attention of Generation X, personalized promotion messages are crucial to make this often overlooked generation feel recognized again (Peralta, 2015).

To be able to address both generations online, it is now the responsibility of marketers to focus their efforts on specific needs and preferences regarding both generations. As the results of this study reveals, risks in the online environment do effect both generations in their online shopping behavior. Therefore, investments in risk-reducing strategies are recommended in order to make both generations feel safer while shopping online.

In order to address the consumers' transaction risk, e-vendors need to provide transparent transaction processes. By making sure that consumers know about transaction steps and how payment and orders will be processed, a feeling of safety will be created. Money-back guarantees as well as simplified return policies further counteract on consumers fear of financial losses. (Cases, 2002) In addition, order-checking systems enhance the consumers' feeling about control and further create a sense of safety (Nepomuceno, Laroche, & Richard, 2014). Within this study both generations rated PayPal as the payment method they feel safest with. Providing a range of different payment methods in the transaction process enables consumers to select the one they feel most secure with.

Privacy risk is indicated as another main concern of consumer while shopping online. Fears of personal data being lost, sold or stolen in the online environment should therefore be addressed by e-vendors in order to make their consumers feel safe. This displays the need for e-vendors to provide certain guarantees regarding, safety and privacy protection to establish confidence

that data is handled appropriately (Chiu, Wang, Fang, & Huang, 2014). Privacy protection is in the responsibility of the e-vendor (Milne, Rohm, & Bahl, 2004). However, consumers can, by themselves, also engage in different practices to increase their online safety. The results show, that those, who are actually more threatened by privacy, are those who by themselves do less for their data security. This indicates a need for education towards more self-regulated behavior in privacy protection online. Educational steps should therefore focus on applications and actions, like the installation of firewalls, virus protection software, e-mail encryption and the rejection of unnecessary cookies (Milne, Rohm, & Bahl, 2004). Education is seen as a huge step towards an increase in security online and should therefore be of high concern for e-vendors. By investing in such education programs, e-vendors will help consumers to increase their feeling of safety online and thus fears towards online shopping are expected to decrease as well. By investing in marketing strategies that aim to reduce perceived risks of consumers online, the relationship of consumers and e-vendors is enhanced and e-vendors are more able to better utilize the opportunities of selling their product online.

## 6.2 Theoretical Implications

The results of this study contribute to the existing literature in multiple ways. Firstly the focus is specifically on consumers' privacy perceptions online, where risk and trust types are chosen to underline this particular focus. Measuring and underlining the importance of privacy and security in the online shopping setting addresses a recent problem of e-commerce, regarding data handling and theft. Secondly, the study identifies the difference of two generational groups, namely Generation X and Millennials to reveal how age influences risk and trust perceptions, instead of solely looking at the perception of risk and trust in general. Therefore, this study on the one hand provides additional evidence on the findings regarding the effect of risks on consumer's online and on risk as a predictor for online shopping behavior. On the other hand it adds to current literature with specific focus on two generational groups.

As the focus lays on two different generational groups, interested readers are able to find a brief summary of generation-specific characteristics, attributes and online shopping behavior within this study. As customer segmentation regarding age differences may be a useful tool for researchers and marketers, the information provided could further be used as knowledge base for the evaluation of marketing strategies based on individual consumer needs and preferences. Additionally, as our study is in itself neither based on any industry nor a specific product range the results of our study can be applied to a wide range of online business situations.

## 6.3 Recommendations for further research

The framework of this study may also be used for further analysis in the following way. Firstly, within this study the focus is on the experience, behavior and general opinion of respondents. However, no specific online shop or website was used as role model for respondents to base their privacy perceptions on. This led to the construct of cognition-based to be deleted, as respondents had to generalize their opinion about online shops. Therefore, for further research it is recommended to provide respondents with a specific online shop. Thus, respondents are able to focus their answers and further interesting results could be revealed.

Within this study we focused on the perception of risk and trust as two separate constructs to measure privacy perceptions of consumers online with ignoring possible dynamics between perceived risk and trust. Further research may therefore focus

on identifying these dynamics in order to detect possible compensation strategies between both constructs. In specific, analyzing if perceived risk could be balanced by investing in trust-related features, like reviews or security certification. This may be useful to give advice for specialized online marketing strategies. The overall expectations that fears possess a higher impact than positive events, and the fact that more effort is needed to decrease fears than to create trust can hereby be either underlines or refuted.

## 6.4 Limitations

As it is the case with other studies in social science this paper does also face limitations. The first limitation is that this study is conducted with limited capabilities and within restricted time frame of 10 weeks. Further the sample size (n=198) could be considered as too small as a larger sample could reveal different results. Consequently, the sample size as well as the limited capabilities narrows the power of the results of this study. The second overall limitation concerns the data collection with the questionnaire being developed and translated by the authors themselves, which may lead to misinterpretation of question items by respondents. Although a re-translation method was used to prevent emerging misinterpretations the limitation still exists as no native speaker assisted in the construction of the English version. Within our questionnaire some questions items may be sensible to social desirability with respondents pretending, for example to know a wide range of security certifications online, to conceal their inexperience. In addition, as only the German respondents are used for the analysis, the results are restricted to the German population.

## 7. CONCLUSION

Within the online shopping context, both generations, the Millennials as well as Generation X resulted in an interesting target segment for vendors and marketers. The expectation about younger generations being the leader in Internet interaction, knowledge and skill is fading. Older generations, like Generation X, are able to keep up to enjoy the many advantages the Internet offers with regards to convenience, price comparison, variety and many others. For vendors to exploit the full purchasing power of both generations it is crucial to address their generation-specific needs and preferences in online shopping. A strong focus on consumers' privacy and security concern is essential in order to assist consumer in risk reduction to make them feel safe while shopping online. Addressing their fears is essential not only in an assisting way, but also by preventing consumers to get in contact with new risks. The complexity of the Internet is high and will further develop in the future it is therefore crucial for marketers to be aware of new risks evolving to prevent consumers from being confronted with risks they did not encounter. The emergence of new risk factors constitutes as new threats for both consumers as well as e-vendors themselves. Therefore, education for both groups is necessary in order to make marketers able to protect their customers and for consumer to be able to engage in own privacy behavior.

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## 10. APPENDIX

### 10.1 Survey Analysis

#### Appendix 1: Correlation analysis

##### Correlations

		1	2	3	4	5	6	7	8
Spearman's rho	1 Age	1,000							
	2 Gender	,025	1,000						
	3 Perceived risk	-,116	,188**	1,000					
	4 Transaction risk	-,069	,226**	,816**	1,000				
	5 Privacy risk	-,163*	-,093	,411**	,016	1,000			
	6 Source risk	,067	,184**	,555**	,288**	-,008	1,000		
	7 Affect-based trust	,083	,031	,146*	,064	,069	,213**	1,000	
	8 Online Shopping Behavior	,168*	-,120	-,188**	-,290**	,124	-,088	,128	1,000

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

#### Appendix 2: Regression Analysis

##### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,316 <sup>a</sup>	,100	,081	,67812

a. Predictors: (Constant), AffectTrustMean, PrivacyRiskMean, TransactionRiskMean, SourceRiskMean

b. Dependent Variable: OnShopBeh

##### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9,847	4	2,462	5,354	,000 <sup>b</sup>
	Residual	88,749	193	,460		
	Total	98,596	197			

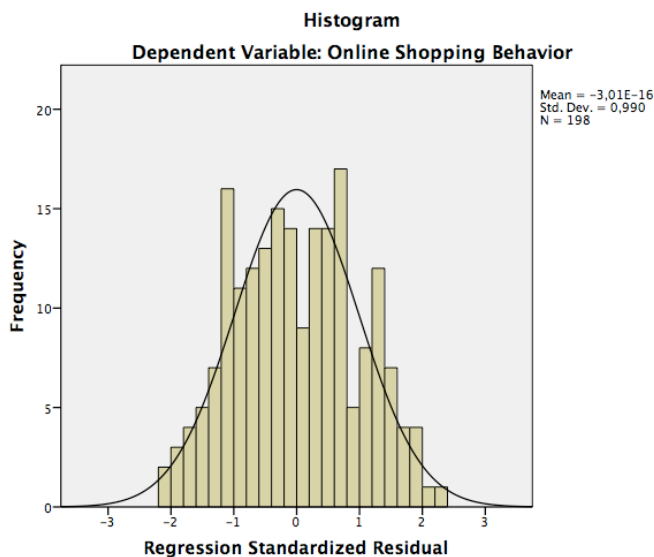
a. Dependent Variable: OnShopBeh

b. Predictors: (Constant), AffectTrustMean, PrivacyRiskMean, TransactionRiskMean, SourceRiskMean

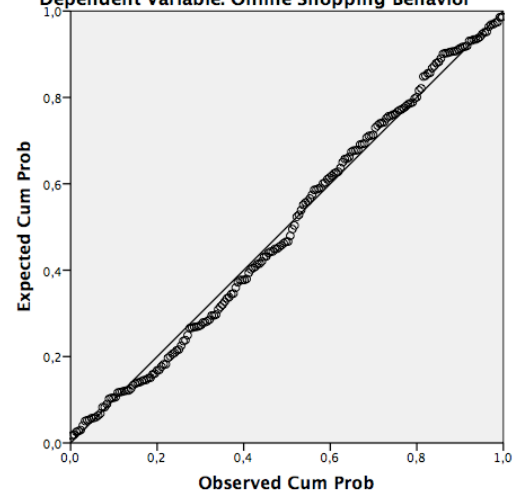
##### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients		95,0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	
1	(Constant)	2,829	,327		8,649	,000	2,184 3,474
	Transaction risk	-,181	,050	-,262	-3,633	,000	-,280 -,083
	Privacy risk	,043	,040	,073	1,071	,286	-,036 ,122
	Source risk	-,030	,053	-,042	-,565	,573	-,135 ,075
	Affect-based trust	,094	,040	,163	2,324	,021	,014 ,174

a. Dependent Variable: OnShopBeh



**Normal P-P Plot of Regression Standardized Residual**  
Dependent Variable: Online Shopping Behavior



### Appendix 3: ANCOVA

#### Tests of Between-Subjects Effects

Dependent Variable: OnShopBeh

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	13,703 <sup>a</sup>	9	1,523	3,372	,001
Intercept	30,498	1	30,498	67,540	,000
Age	1,173	1	1,173	2,598	,109
Transaction risk	6,037	1	6,037	13,368	,000
Privacy risk	1,332	1	1,332	2,949	,088
Source risk	,438	1	,438	,970	,326
Affect-based trust	1,651	1	1,651	3,656	,057
Age * Transaction risk	,557	1	,557	1,233	,268
Age * Privacy risk	,100	1	,100	,222	,638
Age * Source risk	,266	1	,266	,590	,443
Age * Affect-based trust	,015	1	,015	,033	,856
Error	84,894	188	,452		
Total	1499,938	198			
Corrected Total	98,596	197			

a. R Squared = ,139 (Adjusted R Squared = ,098)

#### Parameter Estimates

Dependent Variable: OnShopBeh

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	3,418	,525	6,505	,000	2,382	4,455
Millennials	-1,121	,696	-1,612	,109	-2,493	,251
Generation X	0 <sup>a</sup>	.	.	.	.	.
Transaction risk	-,257	,089	-2,872	,005	-,433	-,080
Privacy risk	,051	,054	,944	,346	-,056	,158
Source risk	-,096	,086	-1,112	,268	-,266	,074
Affect-based trust	,098	,081	1,210	,228	-,062	,257
Millennials * Transaction risk	,120	,108	1,110	,268	-,093	,332
Generation X * Transaction risk	0 <sup>a</sup>	.	.	.	.	.
Millennials * Privacy risk	,039	,082	,472	,638	-,123	,201
Generation X * Privacy risk	0 <sup>a</sup>	.	.	.	.	.
Millennials * Source risk	,084	,109	,768	,443	-,132	,300
Generation X * Source risk	0 <sup>a</sup>	.	.	.	.	.
Millennials * Affect-based trust	-,017	,093	-,182	,856	-,201	,167
Generation X * Affect-based trust	0 <sup>a</sup>	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

### Appendix 4: Independent T-Test Privacy Behavior

#### Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Privacy behavior	Millennials	127	3,0602	,92719	,08228
	Generation X	71	3,7535	1,07745	,12787

#### Independent Samples Test

Levene's Test for Equality of Variances					t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Privacy behavior	Equal variances assumed	2,836	,094	-4,757	196	,000	-,69334	,14574	Lower - ,98076 Upper -,40592
	Equal variances not assumed			-4,560	127,790	,000	-,69334	,15205	Lower -,99421 Upper -,39247



### 10.3 Questionnaire

#### How do you shop online? - Bachelor Thesis Final Version

Introduction Dear participants, Thank you for taking your time to participate in the Online Shopping survey. It will only take 5 - 10 minutes to answer this survey. It is part of our bachelor thesis at the University of Twente, Enschede, The Netherlands. We truly value the information you will provide. Please answer the questions honestly and choose the answer you first think of. All the data you provide will be confidential. The data is protected against unauthorized publishing, manipulation or damage. The information collected is only used for the purposes of academic research. Your participation in this study is voluntary, you can stop the survey anytime without giving any reasons. Of course we still appreciate if you answer the whole survey - the more answers the better our survey result. Please click on the ">>" button to move to the next page.

*Demographics 1 How old are you? (fill in the number only, e.g. 56)*

*Demographics 2 What is your gender?*

- ☐ Male
- ☐ Female

*Demographics 3 What is your nationality?*

- ☐ German
- ☐ Dutch
- ☐ Belgian
- ☐ Chinese
- ☐ Other (please fill in below) \_\_\_\_\_

*Demographics 4 What is your current occupation?*

- ☐ Student
- ☐ Employed
- ☐ Self-employed
- ☐ Unemployed
- ☐ Retired
- ☐ Stay-at-home
- ☐ Unable to work

*Demographics 5 What is your highest education?*

- ☐ Below High school
- ☐ High school graduate
- ☐ College graduate
- ☐ Trade/technical/vocational training
- ☐ Associate degree
- ☐ Bachelor degree
- ☐ Master degree
- ☐ Doctorate degree
- ☐ Professional degree

*Online Shopping 2 How often do you use the Internet?*

- ☐ Several times a day
- ☐ Once a day
- ☐ Several times a week
- ☐ Once a week
- ☐ Seldom

*Online Shopping 3 I use the Internet to search for a product, but actually buy the product in a retail store*

- |       | 1                     | 2                     | 3                     | 4                     | 5                     | 6                     | 7                     |        |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
| Never | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Always |

*Online Shopping 4 I look for product information in a retail store, but buy the product in an online shop*

- |       | 1                     | 2                     | 3                     | 4                     | 5                     | 6                     | 7                     |        |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
| Never | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Always |

*Online Shopping 5 I search for product information on the Internet and buy the product in an online shop*

	1	2	3	4	5	6	7	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

*Online Shopping 6 For how long have you been shopping online?*

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 4 years or more

*Online Shopping 7 How often did you shop online in the past year?*

- ☐ Never
- ☐ 1 - 5 times a year
- ☐ 6 - 10 times a year
- ☐ Once a month
- ☐ Several times a month

*Online Shopping 8 What type of products do you usually buy online? (multiple answers possible)*

- ☐ Fashion
- ☐ Electronics & Software
- ☐ Books, Music, Films etc.
- ☐ Mobile Phone Apps
- ☐ Health care/ Pharmaceutical products
- ☐ Travel
- ☐ Home and Garden
- ☐ Sports
- ☐ Motors (cars, equipment, etc.)
- ☐ Groceries
- ☐ Cosmetic products
- ☐ Others (please fill in below) \_\_\_\_\_

*Online Shopping 9 How much money do you spend on average per month for online shopping in Euros?*

- ☐ 0-50
- ☐ 50-100
- ☐ 100-200
- ☐ 200-500
- ☐ 500+

*Online Shopping 10 Which online payment methods do you know and use? (multiple answers possible)*

- ☐ Credit card
- ☐ PayPal
- ☐ iDeal
- ☐ Klarna
- ☐ Cash on delivery
- ☐ Direct debit
- ☐ In-app purchases
- ☐ Digital wallet
- ☐ Bitcoin
- ☐ AliPay
- ☐ Wechat
- ☐ Other (please fill in below) \_\_\_\_\_

*Online Shopping 11 What is the payment method you feel most safe with?*

- ☐ Credit card
- ☐ PayPal
- ☐ iDeal
- ☐ Klarna
- ☐ Cash on delivery
- ☐ Direct debit
- ☐ In-app purchases
- ☐ Digital wallet
- ☐ Bitcoin
- ☐ AliPay
- ☐ Wechat
- ☐ Other (please fill in below) \_\_\_\_\_

*Online Shopping 12 What are the main motivating factors for you to shop online? (multiple answers possible)*

- ☐ Better prices
- ☐ Convenience
- ☐ Variety of products/brands
- ☐ Flexibility (24/7 open)
- ☐ Availability of reviews and recommendations
- ☐ Discreteness of shopping
- ☐ Price comparisons
- ☐ Others (please fill in below) \_\_\_\_\_

*Online Shopping 13 What are main factors preventing you from shopping online? (multiple answers possible)*

- ☐ Online Payment Methods
- ☐ Added tax/ customs duty
- ☐ High delivery costs
- ☐ Long delivery time
- ☐ Refund policies
- ☐ Warranty & Claims
- ☐ No physical product (intouchable, no real colours, no fitting etc.)
- ☐ Others (please fill in below) \_\_\_\_\_

*Privacy behavior 1 Do you use different E-Mail accounts for different purposes?*

- ☐ Yes, different ones for different purposes (online shopping, work, private etc.)
- ☐ No, I have only one E-Mail account

*Privacy behavior 2 Do you use different passwords for different websites?*

- ☐ Yes, a different one for each website
- ☐ Yes, only a few websites with the same password
- ☐ Yes, but several websites with the same password
- ☐ No, the same password for each website

*Privacy behavior 3 Which safety feature logos for online shops do you know? (multiple answers possible)*

*Privacy behavior 4 Would you refuse to give information to an online shop, if you think it is too personal or not necessary for the transaction?*

- |       |                       |                       |                       |                       |                       |                       |                       |        |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
|       | 1                     | 2                     | 3                     | 4                     | 5                     | 6                     | 7                     |        |
| Never | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Always |

*Privacy behavior 5 Do you read privacy policies on online shopping websites?*

- |       |                       |                       |                       |                       |                       |                       |                       |        |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
|       | 1                     | 2                     | 3                     | 4                     | 5                     | 6                     | 7                     |        |
| Never | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Always |

*Privacy behavior 6 Would you refuse an online purchase because of privacy policies?*

	1	2	3	4	5	6	7	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

*Privacy behavior 7 Do you read terms and conditions on online shopping websites before you agree to them?*

	1	2	3	4	5	6	7	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

*Privacy behavior 8 Would you refuse an online purchase because of terms and conditions?*

	1	2	3	4	5	6	7	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

Risk 1 I believe that my personal information is protected during online shopping

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 2 I am aware that my private data can be given to 3rd parties by online shopping sites

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 3 I am aware that advertisement is based on my prior searches and shopping behavior

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 4 I receive newsletters/mails from online shops I did not register for

	1	2	3	4	5	6	7	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

Risk 5 The possibility that online shops are fake is high

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 6 The possibility that my online purchase will not be delivered is high

Entirely disagree	Mostly disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Mostly agree (6)	Entirely agree (7)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 7 I buy from online shops without a physical store

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 8 I am afraid to use my credit card online

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 9 The possibility that hackers will steal my credit card information is low

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 10 The possibility that my credit card information is sold to third parties is high

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk 11 In general I trust mainstream online payment methods

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust 1 The product information I get in online shops is complete and understandable

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust 2 Privacy policies in online shops are easily accessible and understandable

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust 3 I expect mainstream online shops to fulfill basic digital security protection(s)

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust 4 I check for safety logos and certification (e.g. trusted e-shops) in online shops before I purchase.

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust 5 I ask friends and family for recommendations of an online shop before I purchase

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust 6 I read reviews of an online shop before I purchase

Entirely disagree	Mostly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Mostly agree	Entirely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q46 Have you ever had a bad experience with an online shop related to privacy and security concerns? Please share your experience below. End This is the end! Thank you again for participating in our survey. Please click one step further to send your answers! If you are interested in the results of this study, please enter you email-address and we will contact you. (Please name below)

## 10.4 SPSS Syntax

### Filter, Recode

RECODE Demographics\_1 (18 thru 24=1) (35 thru 49=2) (ELSE=0) INTO Age1824a3549.

EXECUTE.

USE ALL.

COMPUTE filter\_\$=(Q51 = 1 & Age1824a3549 > 0 & Demographics\_3 = 1).

VARIABLE LABELS filter\_\$ 'FILTERfilter'.

VALUE LABELS filter\_\$ 0 'Not Selected' 1 'Selected'.

FORMATS filter\_\$ (f1.0).

FILTER BY filter\_\$.

EXECUTE.

RECODE Risk\_1\_1 Risk\_7\_1 Risk\_9\_1 Risk\_11\_1 (1=7) (2=6) (3=5) (4=4) (5=3) (6=2) (7=1).

EXECUTE.

RECODE Online\_Shopping\_2 (8=1) (6=2) (9=3) (3=4) (4=5).

EXECUTE.

#### **Risk: Variable construction & Reliability analysis**

COMPUTE

RiskMeanGeneral=MEAN(Risk\_2\_1,Risk\_3\_1,Risk\_5\_1,Risk\_6\_1,Risk\_8\_1,Risk\_9\_1,Risk\_10\_1,Risk\_11\_1).

EXECUTE.

COMPUTE TransactionRiskMean=MEAN(Risk\_8\_1,Risk\_9\_1,Risk\_10\_1,Risk\_11\_1).

EXECUTE.

COMPUTE PrivacyRiskMean=MEAN(Risk\_2\_1,Risk\_3\_1).

EXECUTE.

COMPUTE SourceRiskMean=MEAN(Risk\_5\_1,Risk\_6\_1).

EXECUTE.

RELIABILITY

/VARIABLES= Risk\_2\_1 Risk\_3\_1 Risk\_5\_1 Risk\_6\_1 Risk\_8\_1 Risk\_9\_1 Risk\_10\_1 Risk\_11\_1

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL.

RELIABILITY

/VARIABLES=Risk\_8\_1 Risk\_9\_1 Risk\_10\_1 Risk\_11\_1

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL.

RELIABILITY

/VARIABLES=Risk\_2\_1 Risk\_3\_1

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL.

RELIABILITY

/VARIABLES=Risk\_5\_1 Risk\_6\_1

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL.

#### **Trust: Variable Construction & Reliability analysis**

COMPUTE TrustMeanGeneral=MEAN(Trust\_4\_1,Trust\_5\_1,Trust\_6\_1).

EXECUTE.

COMPUTE AffectTrustMean=MEAN(Trust\_4\_1,Trust\_5\_1,Trust\_6\_1).

EXECUTE.

RELIABILITY

/VARIABLES=Trust\_4\_1 Trust\_5\_1 Trust\_6\_1

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL.

#### **Validity: Factor Analysis**

FACTOR

/VARIABLES Risk\_2\_1 Risk\_3\_1 Risk\_5\_1 Risk\_6\_1 Risk\_8\_1 Risk\_9\_1 Risk\_10\_1 Risk\_11\_1 Trust\_4\_1 Trust\_5\_1  
Trust\_6\_1 Trust\_1\_1 Trust\_2\_1 Trust\_3\_1 Risk\_1\_1 Risk\_4\_1 Risk\_7\_1

/MISSING LISTWISE

/ANALYSIS Risk\_2\_1 Risk\_3\_1 Risk\_5\_1 Risk\_6\_1 Risk\_8\_1 Risk\_9\_1 Risk\_10\_1 Risk\_11\_1 Trust\_4\_1 Trust\_5\_1  
Trust\_6\_1 Trust\_1\_1 Trust\_2\_1 Trust\_3\_1 Risk\_1\_1 Risk\_4\_1 Risk\_7\_1

/PRINT INITIAL CORRELATION DET KMO ROTATION

/FORMAT SORT BLANK(.3)

/CRITERIA MINEIGEN(1) ITERATE(25)

/EXTRACTION PAF

/CRITERIA ITERATE(25)

/ROTATION VARIMAX

/METHOD=CORRELATION.

FACTOR

/VARIABLES Risk\_2\_1 Risk\_3\_1 Risk\_5\_1 Risk\_6\_1 Risk\_8\_1 Risk\_9\_1 Risk\_10\_1 Risk\_11\_1 Trust\_4\_1 Trust\_5\_1  
Trust\_6\_1

/MISSING LISTWISE

/ANALYSIS Risk\_2\_1 Risk\_3\_1 Risk\_5\_1 Risk\_6\_1 Risk\_8\_1 Risk\_9\_1 Risk\_10\_1 Risk\_11\_1 Trust\_4\_1 Trust\_5\_1  
Trust\_6\_1

/PRINT INITIAL CORRELATION DET KMO ROTATION

/FORMAT SORT BLANK(.3)

/CRITERIA MINEIGEN(1) ITERATE(25)

/EXTRACTION PAF

/CRITERIA ITERATE(25)

/ROTATION VARIMAX

/METHOD=CORRELATION.

#### **Online Shopping Behavior: Variable Construction & Reliability Analysis**

COUNT ProductExp=Online\_Shopping\_8\_1 Online\_Shopping\_8\_2 Online\_Shopping\_8\_3 Online\_Shopping\_8\_4  
Online\_Shopping\_8\_5 Online\_Shopping\_8\_6

Online\_Shopping\_8\_7 Online\_Shopping\_8\_8 Online\_Shopping\_8\_9 Online\_Shopping\_8\_10 Online\_Shopping\_8\_11  
Online\_Shopping\_8\_12(1).

EXECUTE.

RECODE ProductExp (1=1) (2=2) (3=3) (4=4) (5 thru 12=5).

EXECUTE.

COUNT PaymentExp=Online\_Shopping\_10\_1 Online\_Shopping\_10\_2 Online\_Shopping\_10\_3 Online\_Shopping\_10\_4  
Online\_Shopping\_10\_5 Online\_Shopping\_10\_6

Online\_Shopping\_10\_7 Online\_Shopping\_10\_8 Online\_Shopping\_10\_9 Online\_Shopping\_10\_10 Online\_Shopping\_10\_11  
Online\_Shopping\_10\_12(1).

EXECUTE.

RECODE PaymentExp (1=1) (2=2) (3=3) (4=4) (5 thru 12=5).

EXECUTE.

COMPUTE OnShopBeh=MEAN(Online\_Shopping\_7,ProductExp,Online\_Shopping\_9,PaymentExp).

EXECUTE.

COMPUTE OnShopExp=Online\_Shopping\_6.

EXECUTE.

RELIABILITY

/VARIABLES=Online\_Shopping\_7,ProductExp,Online\_Shopping\_9,PaymentExp



```

/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/STATISTICS=DESCRIPTIVE SCALE
/SUMMARY=TOTAL.

```

#### Survey Results: Online Shopping Behavior

```

T-TEST GROUPS=Age1824a3549(1 2)
/MISSING=ANALYSIS
/VARIABLES=Online_Shopping_2 Online_Shopping_6
/CRITERIA=CI(.95).

T-TEST GROUPS=Age1824a3549(1 2)
/MISSING=ANALYSIS
/VARIABLES=OnShopBeh
/CRITERIA=CI(.95).

T-TEST GROUPS=Age1824a3549(1 2)
/MISSING=ANALYSIS
/VARIABLES=Online_Shopping_7 Online_Shopping_9 ProductExp PaymentExp
/CRITERIA=CI(.95).

```

#### Survey Results: Privacy Perception Variable + Risk and Trust Types

```

COMPUTE                                PrivacyPercMean                                =                                MEAN
(Risk_1_1,Risk_2_1,Risk_3_1,Risk_5_1,Risk_6_1,Risk_8_1,Risk_9_1,Risk_10_1,Risk_11_1,
Trust_4_1,Trust_5_1,Trust_6_1).

```

```
EXECUTE.
```

```

T-TEST GROUPS=Age1824a3549(1 2)
/MISSING=ANALYSIS
/VARIABLES=PrivacyPercMean RiskMeanGeneral TransactionRiskMean PrivacyRiskMean SourceRiskMean
AffectTrustMean
/CRITERIA=CI(.95).

```

```

GLM TransactionRiskMean PrivacyRiskMean SourceRiskMean BY Age1824a3549
/WSFACTOR=measures 3 Polynomial
/METHOD=SSTYPE(3)
/EMMEANS=TABLES(measures) COMPARE ADJ(BONFERRONI)
/EMMEANS=TABLES(Age1824a3549*measures) compare(Age1824a3549)
/EMMEANS=TABLES(Age1824a3549*measures) compare(measures)
/CRITERIA=ALPHA(.05)
/WSDESIGN=measures
/DESIGN=Age1824a3549.

```

#### Survey Analysis

```

NONPAR CORR
/VARIABLES=Age1824a3549 Demographics_2 RiskMeanGeneral TransactionRiskMean PrivacyRiskMean
SourceRiskMean AffectTrustMean OnShopBeh
/PRINT=SPEARMAN TWOTAIL NOSIG
/MISSING=PAIRWISE.

```

```

REGRESSION
/DESCRIPTIVES MEAN STDDEV CORR SIG N
/MISSING LISTWISE
/STATISTICS COEFF OUTS CI(95) R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT OnShopBeh

```

```

/METHOD=ENTER TransactionRiskMean PrivacyRiskMean SourceRiskMean AffectTrustMean
/SCATTERPLOT=(*ZRESID,*ZPRED)
/RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).
UNIANOVA OnShopBeh BY Age1824a3549 WITH TransactionRiskMean PrivacyRiskMean SourceRiskMean
AffectTrustMean
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/PRINT=PARAMETER DESCRIPTIVE
/CRITERIA=ALPHA(.05)
/DESIGN=Age1824a3549 TransactionRiskMean PrivacyRiskMean SourceRiskMean AffectTrustMean
Age1824a3549*TransactionRiskMean
Age1824a3549*PrivacyRiskMean Age1824a3549*SourceRiskMean AffectTrustMean*Age1824a3549.
Survey Analysis: Privacy Behavior
RECODE Privacy_behavior_1 (2=1) (1=7).
EXECUTE.
RECODE Privacy_behavior_2 (1=7) (2=5.5) (3=2.5) (4=1).
EXECUTE.
COMPUTE
PrivacyBehavior=MEAN(Privacy_behavior_1,Privacy_behavior_2,Privacy_behavior_4_1,Privacy_behavior_5_1,Privacy_b
ehavior_6_1,Privacy_behavior_7_1,Privacy_behavior_8_1).
EXECUTE.
T-TEST GROUPS=Age1824a3549(1 2)
/MISSING=ANALYSIS
/VARIABLES=PrivacyBehavior
/CRITERIA=CI(.95).

```